NCIC

Northern Community Investment Corporation

Strengthening businesses, communities, and employment opportunities.

Action Plan for Agriculture and Food System Development

Creating Job Growth in Agriculture and Food Production: Opportunities and Realities

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INTRODUCTION

About the Northern Community Investment Corporation

Vermont and New Hampshire are very different states in their politics, governments and styles, yet in 1975 the leaders of the Northeast Kingdom and the North Country recognized that together they form a natural region sharing common interests and challenges. As a result, NCIC was established as a non-profit, certified Community Development Financial Institution working to address regional economic challenges. Click here to learn more about our history.

Today, with a diverse Board of Directors, fourteen employees and offices in Lancaster NH and Saint Johnsbury VT, NCIC serves New Hampshire's Carroll, Coos, and Grafton counties and Vermont's Caledonia, Essex, and Orleans counties.

Its focus continues to be on building partnerships and developing creative and effective solutions for individual businesses, communities and the region, to ensure that the region continues to offer a strong and growing business climate, and diverse employment opportunities.

The consultant team

Rosalie J. Wilson specializes in business planning and market development for public and private entities within the farm and food sector. Since 2004 Rose has consulted with more than one hundred organizations and businesses helping evaluate, test, and implement successful business and marketing strategies. During her career, Rose was also Main Street Manager for the town of Windsor, Vermont; Business Development Manager for Harpoon Brewery; and a National Sales Manager and Vertical Market Supervisor for Geographic Data Technology, Inc. Rose has extensive experience exploring all sides of business viability, evaluating the operational, market, and financial aspects of an existing or proposed business concept in order to ensure a financially and logistically sound model is developed for long term sustainability. Rose has authored numerous local and regional studies on opportunities within the regional agricultural economy and frequently conducts marketing, financial, and business planning workshops across Vermont and New Hampshire. Rose is a member of NOFA Vermont, Rural Vermont, and the Vermont Fresh Network and serves on the NOFA Loan Committee.

Jeffrey P. Roberts has extensive experience working with businesses, higher education, government, and nonprofit organizations to develop innovative solutions in the areas of agriculture and food policy, conservation, and community development. During his career, Jeff was a meteorologist, historian, and consultant in architecture, history, and land use. At the University of Pennsylvania, he was Associate Dean for Development and Planning at the School of Veterinary Medicine. In 1995, he joined the Vermont Land Trust as Vice President for External Affairs.

He co-founded the Vermont Institute for Artisan Cheese at the University of Vermont. His book, *The Atlas of American Artisan Cheese*, was the first comprehensive survey of small-scale producers. Jeff is a member of Guilde Internationale des Fromagers, teaches the history and culture of food at the New England Culinary Institute, and is a visiting professor at the Slow Food University of Gastronomic Science in Italy. He provides services to small-scale food producers and is a frequent speaker in Europe and the United States on artisan food, sustainable agriculture, and the working landscape. Jeff was active in Slow Food International and USA and the Vermont Fresh Network.

About the report

We designed the report for a diverse audience of farmers, food producers and processors, community leaders and citizens, government agencies, and nonprofit organizations. We believe the Northern Tier communities of Maine, New Hampshire, and Vermont will benefit from the information, analysis, and recommendations about existing and potential new products and markets. For example, farmers and food producers will find detailed data about products and markets, as well as gain perspectives and assessments about the challenges to create profitable farms and businesses. On the other hand, since not every reader wants in-depth information, the **executive summary** provides an overview of findings, analysis, and recommendations.

The main text divides into chapters with overall assessments and recommendation. Each key element, for example proteins, contains findings, analysis, and recommendations; this **second level** focuses attention to major farm and food trends. Finally, the **appendices** provide rich, diverse details about farms, producers, other food system participants, and markets.

The authors wish to thank the staff at Northern Community Investment Corporation and the dozens of colleagues, individuals, agencies, and organizations that provided support, time, and knowledge to us.

Some photos courtesy of USDA Agricultural Research Service and the USDA Natural Resources Conservation Service.

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EXECUTIVE SUMMARY

The **authors see great opportunities for local agriculture and food production**. Within each state, we learned about exciting change and creative approaches as farmers and entrepreneurs develop new innovative businesses. In many places, we identified how **small business growth changed or leveraged traditional practices and provided new employment opportunities**.

We start with a simple equation: **farming and food production remain challenging**, often very difficult enterprises to make a sustained living. However, the commitment by so many individuals to **pursue their dreams inspires and humbles** us. Putting food on the table is central to human survival... **let us support and celebrate this community**!

With the completion of this report and the Food Systems Research Institute's inventory, the door is open for NCIC to play a significant future role across three states. We recommend an aggressive, opportunistic, timely outlook with NCIC as a key advocate with farm and food communities. Although farming and food are not NCIC'S traditional focus, we contend the agency is well positioned to **inspire, innovate, and invest for the future of agriculture and forests.**

- **Inspire both old and new generations** of farmers and food entrepreneurs.
- **Identify innovative** farming and food trends and enterprises.
- **Invest in the best** at every level of our communities
- **Designate an NCIC official** to lead the effort to stimulate dialogue at local, community levels and help encourage entrepreneurship.

Overall findings and conclusions

Farmers and food producers need greater access to a comprehensive array of **technical assistance** to grow or make products of optimum quality and consistency and to meet USDA regulations, while being profitable**. Technical assistance needs include livestock and dairy production, cured meat, value added products, grain production, and business planning.** We recommend strongly that **NCIC lead a multi-state effort** to identify technical assistance needs and capacities with an eye towards **regional assistance programs and experts. Invest in technical support and resources** across the entire region and within the food system; key individuals and programs are necessary to enable farmers and food professionals to succeed.

As we encourage increased production, NCIC must help to **expand and penetrate *local* and *regional* markets.** NCIC and other agencies must understand the implications of both sides of the supply

and demand equation. We must encourage **active involvement from communities as consumers if we expect success at the local and regional level.**

Invest in capital resources with both direct involvement and partnerships with a diverse community of funders. From private equity to community loan funds to Slow Money initiatives, help to open access to capital resources and **engage new money sources**.

Significant challenges face growers and consumers. **Today's landscape of agriculture and food, while historically never static, has experienced increasingly rapid, and often dramatic alterations and events.** In the past decade, we witnessed an intersection of climate shifts, creating both chronic droughts and extreme storms; increased global demand for grains and proteins; and appearance of new animal and crop diseases. One consequence – we simply have **no guarantees that today's farm and food realities will exist tomorrow**. Therefore, the report's data, analysis, and recommendations **must be viewed cautiously**. The challenge to maintain a competitive position with volatile prices for raw materials remains a central issue for all farmers.

Entrepreneurial collaboration is clearly a hallmark in places like Hardwick and Newport VT and Portland and Skowhegan ME. To insure current and future success in more communities, we recommend NCIC identify and cultivate current leadership – entrepreneurs; nonprofit leaders and managers; consensus builders; financial and marketing experts; farm and food advocates; and politicians.

We are encouraged by an **overlap of two communities**: environmental and conservation efforts with food access, social justice, and farm and food enterprises; and a desire from government, foundations, investor groups and private individuals to invest in agriculture and food.

A variety of **population nodes exist**, some of which are well-served, while others offer great **potential as new markets**. Opportunities exist for farmers to sell to institutions, retailers, and restaurants. Beyond population centers, key groups emerge for specific types of food. The **local food movement makes a big difference in consumer attitudes**. Young people, especially the Millennials buy local, good food and spend more of their disposable income on food.

Most retail and restaurant businesses struggle to balance prices to be affordable to consumers yet provide a fair return to farmers. **The issue shows up repeatedly across the study region from diverse businesses: can local food be affordable yet also provide a decent living for the producers?**

The authors conclude the concept of an IGP (indicator of geographic production) designation across the Northern Tier, reflecting the area's unique physical attributes, deserves further study and analysis by NCIC. Although a new Northern Tier brand has potential for sales and marketing, quality and consistency are the most important factors for distributors and retailers to choose a product. Consumer preconceptions about a region's quality and consistency has the potential to either positively or negatively impact a branding effort. These notions must be explored and either leveraged (if good) or addressed (if bad) before launch. The concept of terroir or taste of place points to a potentially significant approach to grow and raise unique agricultural products and market them to discriminating consumers.

Concerns about transportation and distribution logistics characterized many interviews, as geography and long distances are a constant barrier for any farmer or food producer. However, we identify several distributors whose innovative collaborations offer further opportunities.

Whatever the business, one hallmark recommendation is to start small and execute well. Fundamental keys to success were good business management and building relationships with growers and clients.

Proteins

To increase livestock production in the region, **conventional and organic producers must improve product quality, yield, and consistency** to interest buyers. Buyers must support producers by paying fair prices, otherwise, farmers and growers cannot survive. We argue **consumers expect the same features and benefits found in "local" products that they would receive when shopping for "any" product**. Local meat must **meet or exceed quality expectations** consumers assume from current grade A choice beef.

To fulfill these expectations, **every step in production** becomes **essential** to produce **top-notch meat**. From careful genetic selection to pasture management to transportation to slaughter and meat-cutting, each contributes to quality. A farmer makes a huge investment to raise **a steer on grass** over 18 - 24 months**; inappropriate slaughter practices, imprecise butchering, and unattractive or poor packaging** can **compromise this investment** in a few seconds or minutes.

While the fastest growing market opportunity is placement in retail stores, **opportunities to expand direct market sales** do exist across the region. A growing number of individuals seek direct relationships with farms or growers. Recognize the **importance of consumer education about the costs to produce livestock** in our region. **Room for growth exists for "local" protein in all markets** from niche production such as certified organic, 100% grass fed and non-GMO to conventional production. With a changing climate, the region will become increasingly well-suited to grass-fed livestock, a rapidly growing market segment.

For some businesses the **goal is 100% grass fed or certified organic** and therefore, "local" is a secondary benefit. Their consumers are concerned with the **way the meat was raised**, so, a local claim isn't so important. For others, the key element is whether an animal is **100% local** and therefore, concerned with **transparency** and

trust. Companies, providing clear, honest information, will attract positive visibility and increase sales. As demand for local food grows, producers must **understand their target consumer and what drives their decision-making** to insure their business practices and marketing messages speak to their audience**.**

NCIC can help **develop new strategies to emphasize quality grass-fed animals, humane growing and slaughter practices, safety, and local farmers** to shift consumer behavior to purchase New England meat where price difference for local makes sense to more consumers.

Pork

Markets for fresh sausage and dry-cured meats continue to grow. From national companies to small curing operations to wholesalers and retailers of all sizes, owners expressed **enthusiasm about a renaissance of American artisan dry-cured meat**. If great dry-cured meat is available distributors, restaurants, and retailers will buy it.

To make great dry-cured products requires scientific knowledge, specific skills, and talent and access to training and expertise to meet USDA food safety regulations and HACCP plans. **NCIC can contribute to state and regional discussion** about these issues and help **connect potential cured meat entrepreneurs to available funders**, while advocating for **critical scientific and technical support**.

Dairy

In the **past twenty** years, **New England lost nearly half of all its dairy farms.** A **key barrier to maintain viability of the region's dairies is capital**. There is room for all our dairies to exist, large and small, conventional and organic. Those struggling the most are existing, smaller, and older dairies who are least able to access capital. Access to capital will help them implement efficiencies to remain competitive and profitable in a world of tighter and highly volatile margins. **Many farms would benefit from energy efficiency upgrades but cannot obtain capital to make the improvements.** In addition, the future of profitable Northeast dairies links to efficient production of high quality forages.

We recommend NCIC **encourage the development of programs** to provide dairy farmers with the resources necessary to strengthen their businesses and bolster profitability. In addition to Vermont's Farm Viability Program for example, DairyVision Vermont, a farmer-led initiative, recently launched to invigorate, assist, and support large dairy farm operations to build innovative, successful businesses.

Value-added dairy

Within the specialty foods area, **dairy product sales account for 18% of total national** specialty food sales or $6.2 billion annually. We see considerable **opportunities for value-added dairy with markets at every level**

from local to regional and national. Each market offers unique possibilities and challenges. Small-scale dairy processing offers potential opportunities for value-added products from bottling plants to cheese and yogurt to on-farm sales of raw milk.

In 2014, **New England accounts** for at least **181 artisan producers; Maine** leads the way with **73** cheesemakers, followed by **Vermont** at **51** and **New Hampshire** at **12**. Whether businesses owned by **females or in farm families with women cheesemakers,** their presence is key to understanding the growth in all three states. Beyond local retail and direct sales, **artisan cheese appears in many regional and national specialty cheese and food stores as well as multi-unit supermarkets.**

Slow sales in early 2014 raises a **caution flag for the future of the artisan cheese.** Whether too many regional and national producers, too many similar cheeses, the weather or a combination of factors, current and prospective cheesemakers must pay close attention to market changes.

In today's markets, a very **high quality bar exists for artisan cheese.** With intense competition, a cheesemaker cannot rely on labels, stories, or marketing to achieve success. Customers will pay high prices, but **expect outstanding cheese**. In the authors' opinion, **these cautions regarding expectations of quality and consistency apply to all markets and all local food products.**

Cheesemakers need educational offerings, research, and technical support; unfortunately, the region suffers a lack of these services, especially in microbiology and risk management. The stakes are too high to leave safety to chance. In our opinion, **NCIC and other funding agencies** engaged with artisan cheese production, must **advocate for these services**. Making distinctive, consistently high-quality and safe cheese requires support.

Retailers and wholesalers point to markets both locally and beyond for **butter and buttermilk**. Although certified organic designation isn't always important, the interviewees emphasized the **value of local and Vermont** to consumers.

Grains, malts, mills, and flour products

A **growing demand** exists for both **food-grade and livestock grains**, especially organic types. The increase in consumer demand for local grains links in part to overall interest in local foods, as well as diet and health considerations, especially gluten-intolerance.

Rapidly increasing **livestock grain prices forced many farmers to begin grain production** and/or look to local growers to meet their needs. Organic grain prices escalated even faster, a result of expansion of organic dairies, beef, and other meat and poultry operations that require organic feed.

Maine with a topography, climate and geology similar to Quebec, has the potential for large scale, large volume grain production. For example, Aurora Mills in Linneus and Maine Grains at Somerset Grist Mill use only Maine-grown grains to mill flour and roll oats. Both companies work with state farmers to expand the varieties of available wheat and other grains.

Non-traditional Forest & Tree Products

The **entire region has great potential** for diverse, sustainably harvested, non-traditional, managed foods and forest and tree products. A 2010 study of non-timber forest products in the St. John Valley in northern Maine, estimated that northern Mainers used some 120 items from the woods and established NTFP commodities including maple syrup and conifer wreaths **contribute more than $50 million to the northern forest economy annually!**

While rural populations in the three states are different, the concept of an economy built around the forest seems very plausible for the entire Northern Tier. **The authors recommend NCIC explore with Extension service faculties, local experts, and Native American groups, the opportunities for forest-derived, sustainably managed foods and medicines**.

From **Vermont Northeast Kingdom across Northern New Hampshire into Western Maine, maple syrup production is a highlight of the regional economy**. In addition to the economic value of the syrup itself, maple helps define the Northern Tier, generates public visibility and credibility, and attracts tourists, as well as residents.

Birch syrup made from paper birch trees retails for **$300/gallon**, because the birch sap to syrup ratio is closer to 100-150:1. In New England, because birch sap follows maple, it extends a sugarmaker's season and provides supplemental income and improved cash flow without interfering with maple activities. The **two seasons** leverage existing fixed assets and increase return on investment of equipment and infrastructure.

Individuals own a considerable portion of forested land across the study region and many of these private holdings are prime for silviculture management to produce desired hardwood and **nut trees**. Interest exists to develop

edible tree nut cultivation and harvesting in the region, since **American nut trees have a long history of use in New England for food and timber**.

Beyond these products, forests are a potential source of **medicinal plants, herbs, and neutraceuticals**. Both Native Americans and people living in the North woods have long harvested a wide variety of plants for personal use. **The region has significant capacity to increase production of pharmaceutical grade, therapeutic, and medicinal herbs to support the growing worldwide demand for these products**. Such products from the Northern Forest fulfill the desirable characteristics of traceability, production standards, and quality metrics. Northern Tier forests offer an ideal opportunity, especially given the competition is predominantly overseas with questionable oversight on harvesting and production methods.

Cultivated "Wild" Products

We **advise strongly not to make wild forage or harvest a direction for NCIC as these wild resources are limited and fragile**. Rather we stress a "cultivated approach," such as cultivated mushrooms. Appropriate, **sustainable** practices for wild, foraged products **must** underpin any harvesting.

Specialty, organic mushrooms are the fastest-growing segment of the U.S. mushroom market. Direct-to-consumer; wholesale; retail; and restaurants are paying $16.00 – $20.00/lb. for cultivated and sustainably harvested, organic, fresh and dried wild mushrooms. While current mushroom production in the region is limited for both cultivated and wild mushrooms, **producer interest is growing rapidly.** Conversations with several Vermont foragers of mushroom and other wild foods points **to potential interest to create year-round mushroom businesses**. With extensive forest resources across Northern New England, pioneering companies, and a new "best practices manual," the **potential for new enterprises exists.**

The region's long history as an **apple growing** area continued until the middle of the 20th century, when West Coast and then Asian apples supplanted New England. Some enterprising entrepreneurs now grow **heritage and antique varieties for eating and beverage production**.

In the last five years, the **growth of the American craft cider community, especially across the Northern Tier, is astounding**. Cideries like Farnum Hill in West Lebanon NH; Vermont's Citizen Cider (Essex) and Flag Hill Farm (Vershire); and Maine's Kennebec (Winthrop) and Urban Farm Fermentory (Portland) are excellent examples.

A significant problem appeared over the past couple of years – a **shortage of appropriate apples for hard cider**. **For New England apple orchards, orchardists, and nurseries, the shortage may provide an opportunity to diversify – to support a mix of eating and cider apples**. However, **a caution** – developing orchards with sufficient annual yields takes time to bear adequate fruit to support the burgeoning craft cider community.

Another bright opportunity comes from ice cider. These dessert beverages are very similar to ice wine that first appeared on Canada's Niagara Peninsula in the 1980s. Following these precedents, pioneering Quebec apple growers embarked on ice cider production**. Eden Ice Cider** in West Charlestown VT led the movement into ice cider production. From Eden's debut in 2007, **Vermont now counts seven cideries**.

Produce

New England consumers eat increasingly large amount of fresh, locally-grown produce. While the greatest challenge is for out-of-season vegetables, we see **expanded use of high-tunnel cultivation for produce to extend the season**. Farms in Vermont, New Hampshire, Maine, and Quebec grow fresh vegetables year-round using hoop houses and hydroponic production. Northern Tier produce farms could capitalize on the need to **cultivate more storage crops**, since winter demand for local vegetables remains unfulfilled.

Institutional buyers continue to represent a significant opportunity for local food sales. However, of particular concern is **price, quality, quantity, and timely deliveries, and health and food safety protocols and assurances**. Both farmers and buyers need education and mutual understanding.

Everyone from growers to wholesalers, retailers, and restaurants emphasize an essential need for **expanded aggregation facilities, transportation, and distribution networks** especially in the North Country. Feedback from Maine emphasizes an overall need for increased processing capacity for vegetables – mostly for flash-frozen varieties – with major caveats about embarking on a regional facility. In addition, one purpose of food hub incubators is to help new businesses get started without major capital investments. **Recent experiences** with several food and product aggregators or processors raise **significant questions about the efficacy** of these operations.

The authors **do not recommend NCIC proceed with a processing facility**, especially a regional one. While unlikely to be commercially feasible as an enterprise itself, a food hub with various services including storage and freezing, may be a **potential opportunity for private-public partnership** to support the growth of agricultural industry in the region.

Fermented Beverages

Wineries/Grapes

From pioneering wineries like Snow Farm and Shelburne Vineyards, **wine-making in the Northern Tier is now a serious business.** While fruit wines and traditional European types are well-known, **new cold-hardy grapes varieties** that both **tolerate cold and make excellent wine** are planted **in Vermont, New Hampshire, and Maine.** Jerry Rodman in Litchfield ME developed some varieties ideally suited to Maine and other Northern New England states.

Distilled Spirits

Over the past ten to twelve years, the advent of new distilled spirits and cocktails revolutionized American drinking habits, created new generations of consumers, especially Millennials, and helped establish hundreds of innovative bars, taprooms, and restaurants. In New England, data for 2013 shows Vermont with thirteen distillers, New Hampshire four, and Maine six. Many of these distilleries use a **variety of local raw materials** – whey for vodka; barley; corn; maple sap and syrup as a flavoring or to ferment; apples; juniper berries – to create their spirits. Beyond the possibilities for new spirits businesses, a **growing demand for local ingredients creates potential for regional farmers**.

We recommend **NCIC consider the overlapping demand for grains, fermentable fruits, and flavorings that can drive new products and markets**. Work in partnership with the region's distillers, farmers, and grist mills, to identify facility needs, desirable grain and fruit characteristics, and other collaborative opportunities. The growth of distillation in New England, together with the craft beer community, argues for future potential. We recommend drawing upon the knowledge and expertise of these new entrepreneurs to help support new business development.

Craft Beer

Of all the major changes in America's food landscape, none matches the explosive growth of the craft beer renaissance. By 1978, with the exception of Rhode Island's Narragansett Brewing Company (closed in 1981; re-opened 2005) and perhaps one other company, New England had no breweries left. Since then across New England and the country, a renaissance of craft beer production ensued, driven by entrepreneurs and home-brewers who transformed hobbies into businesses (federal legislation signed in 1978 allowing legal beer-making at home contributed to the expansion).

Today, **New England counts at least 230 breweries**, with Massachusetts (70), **Maine (52)**, and **Vermont (31)** the highest totals. Examples like these point dramatically to the potential economic benefit New England's breweries, pubs and taprooms could have on the local agricultural economy if they sourced ingredients locally. **The grain section highlighted some of the potential opportunities for and challenges to Northern New England grains and hops**. Up to this point with few exceptions, all of the region's breweries buy barley, wheat, other grains, and hops from outside sources. **If even only a small percentage of needed grains and hops came from the region, the economic impact would be significant**. Finally, one distinct advantage in New England – access to adequate water resources.

The authors recommend NCIC promote value of local ingredients, especially a wide array of flavor elements. As a result of the USDA Jobs Accelerator Grant, the agency is positioned strongly to connect farm and forestry components to help expand the flavor characteristics found across the Northern Tier.

OVERVIEW

Across the Northern Tier, the **authors see great opportunities for local agriculture and food production**. Within each state, we learned about exciting change and innovative approaches as farmers and entrepreneurs innovate new businesses. In many places, we identified how **small business growth changed or leveraged traditional practices and provided new employment opportunities**. The challenge is whether more producers can take advantage of the opportunities available. How and where can the **Northern Community Investment Corporation make strategic investments and work collaboratively** to best help the region's producers in the immediate, intermediate, and long term?

We start with a simple equation: **farming and food production remain challenging**, often very difficult enterprises to make a sustained living. However, the commitment by so many individuals to **pursue their dreams inspires and humbles** us. Putting food on the table is central to human survival... **let us support and celebrate this community**!

The report documents findings, conclusions, and recommendations. We identify several critical issues that in our opinion are both challenges and opportunities in the Northern Tier**:**

- Fulfilling local demand ties directly to **access to and the price of grain,** both certified organic and conventional, for **human consumption and livestock feed.** The critical place of **grain** cuts across all sectors of food from **meat to baked products to beverages.**

- Farmers and food producers need greater access to **technical assistance t**o grow or make products of optimum quality and consistency and to meet USDA regulations, while being profitable**. Essential technical assistance needs exist for livestock production, cured meat, value added dairy products, grain production, and business planning.**

- **An issue of possible saturation at the local level.** Over the last decade, the region witnessed a significant increase in the number of new farmers the growth of more farmers markets and CSAs, and of retailers committed to buying local foods. However, has the rate at which the region's consumers are converting into local **shoppers kept pace with the increase in availability** or is the expansion in availability simply **cannibalizing markets of established growers**?[1]

1 Cannibalizing our Compatriots - Vermont's Local Banquet

> Can the region **generate more demand from the immediate local and direct sales arena? What are the implications required to service a larger percentage of the local population? How do we expand local interest and ability to purchase local, to make room for increased production?** Are new farms in the region forging new markets or displacing existing producers? **In the authors' opinion, as we encourage increased production, NCIC** must help to **expand and penetrate *local* and *regional* markets.** NCIC and other agencies must understand the implications of both sides of the supply and demand equation. We must support **established growers with the technical assistance, tools, and knowledge necessary** to actively adapt, innovate, and expand in order to **preserve well-earned markets.** Likewise, to attract **new growers,** they need similar support and **reassurance to strengthen existing and build new markets.** We must encourage **active involvement from local communities if we are to expect success at the regional level.**[2]

Tanya Swain, executive director of Western Mountains Alliance in Farmington, observed many local farms look beyond immediate area to market products, generally large urban centers.[3] However, while Western Mountains Alliance can document considerable local demand, the key is educating farmers to the value of selling nearby. The Alliance wrestles with how to develop markets for local farmers. Tanya said modest **incomes for Western Maine residents are a barrier to low volume high-end products**. Considering the NCIC study area as a whole, these observations repeat in such places as St. Johnsbury, Newport, and Hardwick in Vermont and Berlin, Colebrook, and Groveton in New Hampshire.[4]

Where then is the opportunity for growth? While at the local level we may be nearing a saturation point for "early adopters," global demand for locally grown food is on the rise. According to a National Grocery Association 2014 Consumer Panel, 87% of consumers feel availability of locally grown produce and other local packaged foods are major influences on grocery shopping decisions and "more locally grown foods" is the second most desired improvement among surveyed grocery shoppers after "price/cost savings."[5] The National Restaurant Association's annual "What's Hot" culinary forecast, predicting menu trends for the coming year, listed "locally sourced meats

2 Thomas Lyson. *Civic Agriculture: Reconnecting Farm, Food, and Community.* Tufts University. 2004.

3 Interview with Tanya Swain. September 4 2013

4 For example, interview with Tangletown Farms. March 11 2014

5 "**Why Local Food Matters: Importance of Locally-Grown Food In The United States**." USDA. March 2 2014

and seafood" as the number one trend in 2014, followed by "locally grown produce." "Hyper-local sourcing" came in as the number six top trend and "farm/estate branded items" rounded out the top 10.[6]

Nearly three-quarters of the nation's population regularly eats local food; only 27.0% consume them once a month or less.[7] According to a 2012 National Association for the Specialty Food Trade report, *The State of the Specialty Food Industry 2012*, mainstream grocers account for over 70% of specialty food sales, largely as a result of their ability to offer a wide array of products. While these grocers may account for a larger percentage of sales, the rate of specialty food sales is growing fastest in natural food stores at a rate of 20% per year. As specialty foods grow, manufacturers predict the fastest rate of growth will shift to specialty-gourmet stores.

National Restaurant Association "What's Hot" Chef Survey

Top 10 Menu Trends for 2014

1. **Locally sourced meats and seafood**
2. **Locally grown produce**
3. Environmental sustainability
4. Healthful kids' meals
5. Gluten-free cuisine
6. **Hyper-local sources (e.g., restaurant gardens)**
7. Children's nutrition
8. Non-wheat noodles/pasta
9. Sustainable seafood
10. **Farm/estate branded items**

While consumer interest and concern about food origins drives demand, new regulations and legislation contribute to the local food focus. For example, through the new Farm Bill, the U.S. Department of Agriculture launched a loan guarantee program to connect farmers with urban shoppers. USDA operates the "Farmers Marketing and Local Food Promotion Program" to increase domestic consumption of and access to local and regional agricultural products, while developing new market opportunities for farm and ranch operations serving local markets. U.S. Agriculture Secretary Tom Vilsack said demand for local food is growing to between $5 - $7 billion dollars annually. The $78 million in this year's farm bill is the biggest-ever federal boost to local food programs.[8] Individual states also have programs incentivizing the local food movement. For example, all 50 states now have farm-to-school programs.[9] In Vermont and Maine, the food council movement and FoodCorps (AmeriCorps model) are well-recognized and influence everything from policy to business decisions. Vermont's Farm-to-Plate initiative makes a difference within the state and is viewed as a model throughout New England.[10] In New Hampshire, new initiatives and support from organizations such as Ammonuoosuc Conservation Trust, The NH Community Loan Fund, and NCIC help re-direct attention to the food and agriculture movement.

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6 **http://www.restaurant.org/Downloads/PDFs/News-Research/WhatsHot/What-s-Hot-2014**.pdf

7 "Why Local Food Matters: Importance of Locally-Grown Food In The United States." USDA. March 2 2014

8 **Local Food Programs to See Benefits from New Farm Bill. Nebraska Radio Network**. May 27 2014 and http://**http://www.ams.usda.gov/favicon.ico**

9 Local Food Bill. National Sustainable Agriculture Network. 2013.

10 "**Measuring Success: Local Food Systems and the Need for New Indicators**" June 3 2014. Institute for Agriculture and Food Policy.

By 2014, demand for local food has become more mainstream. While "local" is a good trend, it also means changing **expectations** for the product. For example, 53% of all shoppers now cite "convenient access" to local food as "very important," an increase of 17% from a poll in 2012.[11] In the local food movement's infancy, committed consumers made a concerted effort to buy local. Early adopters made a point of going to farmers markets, joining a CSA, and accepting the local product on offer without question. Mainstream consumers want the benefits of local without being inconvenienced or compromising expectations on product performance.

New farm and food entrants, seeing this surge in demand, are eager to enter the market. Often these producers or entrepreneurs adapt their business model and strategy to cater to the new customer's demands. While their products may be aimed at new market segments, they are undoubtedly attract some existing "buy local" consumers, a phenomenon noted earlier. This has begun to create tension with established growers. Competition benefits consumers, by creating choice, spurring innovation and improvements to product quality, customer service and more competitive pricing. However, established businesses find themselves competing for their own market share. On a global scale food consumption is increasing at a rate of 14% per decade, but agricultural production has declined at 2% per decade.[12] This phenomenon indicate room and need for all growers. **The question is can farmers and food producers in the Northern Region fulfill this demand at a price point that is sustainable?**

Significant challenges face growers and consumers. **Today's landscape of food and agriculture, while historically never static, has experienced increasingly rapid, and often dramatic alterations and events.** In the past decade, we witnessed an intersection of climate shifts, creating both chronic droughts and extreme storms; increased global demand for grains and proteins; appearance of new animal and crop diseases; and Internet and social media, establishing new consumption trends seemingly every time we look. These and many others, mean we cannot expect trends and outcomes to remain steady; there are simply **no guarantees that today's farm and food realities will exist tomorrow**.

A recent article in the *Farm Journal*, reporting on a conference in Washington, said:

> *"Farmers may disagree over the cause of climate change, especially whether it's caused by humans, but it's difficult to dismiss the extreme weather patterns that have developed in recent years. Agriculture Secretary Tom Vilsack attributed the new patterns to climate change.*
>
> *'You all know that the climate is changing, and you all know that it impacts agriculture. More intense weather patterns, longer droughts, more severe storms, more pests and diseases—this really does have an impact on agriculture. If we don't get serious about adapting and mitigating, it will just continue.'"*[13]

11 "Why Local Food Matters: Importance of Locally-Grown Food In The United States. "USDA. March 2 2014

12 "**Science Panel Warns of Risks to Food Supply from Climate Change**." *NY Times*. November 2 2013.

13 Boyce Thompson. "**Climate Change Creates New Farming Risks**." *Farm Journal*. June 10 2014.

Wheat and other grains provide a dramatic example. In 2014, the low supplies of organic wheat in the United States for human consumption drove up prices. Heartland Mill in Wichita cannot locate any organic wheat from Kansas or nearby Great Plains states. In February, the company raised prices from $36 to $48 for a 50 pound bag, a 33% jump, a dramatic shift never seen before. Companies turned to King Arthur Flour in Norwich VT, only to see it raise prices to Heartland's level, a reflection of shortages everywhere. In early June, the Heartland's price rose to $53 for a 50 pound bag; in the three month period, customers experienced a 47% in price for a fundamental ingredient. In order to stay in business, Heartland turned to organic wheat from Argentina. In the spring, King Arthur announced it was suspending sale of its organic wheat flours until further notice. Although Vermont bakeries can buy less expensive, local or Quebec-grown, non-organic wheat flour, the quality does not always equal Heartland (see further discussion in the grain chapter).[14]

The underlying reasons for this dramatic jump: the Great Plains drought and steadily higher worldwide demand. Randy George, co-owner of Red Hen Baking Company, said no one from Heartland Mill to the bakers saw a shift of this magnitude coming six months ago (even Annie's Homegrown, with 20% price increases in a three month period, didn't see the volatility)! The implications are serious, especially to the entire organic community. As of the date of this report, supplies of organic grains are very tight for animal feed and human use. Growers and food producers must compete for these basic raw materials to maintain organic certification, animal health, and quality. For example, such grains are essential to dairies; artisan cheesemakers; egg and poultry farmers; and meat producers, whether grass-based or not.

Winter or hard (durum) wheat harvest occurs in late spring into summer months. In 2014, rain arrived in the Central Plains just as the harvest commenced. Today, it is too early to determine whether the ill-timed rain exacerbated the current shortages.

We argue strongly **the report's data, analysis, and recommendations must be viewed through a cautious lens**. The challenge to maintain a competitive position with volatile prices for raw materials, conventional or organic, remains a central issue for all farmers. While applauding the extraordinary positive, rapid transformation of the regional food system, farming and food production are at the mercy of climate, weather, and changing markets. Furthermore, Northern New England is not an island, immune from regional to international trends; one excellent example is the current rise of fluid milk prices, driven principally by foreign demand for American dairy products.

What can be done for local producers to maintain and expand market share? The key questions are: who is today's consumer and how can producers talk to them? In a 2013 report, Ketchum Global Food and Nutrition Practice identified two major shifts in the consumer profile.

14 See details in the Grain chapter of the report.

Target the Male Consumer

1. Create simple and black and white rather than colorful packaging
2. Use words that relate to how your product associates with male features/benefits such as such a yogurt being high in protein (which men equate with power) versus being low in fat (which appeals to women).
3. Keep product use and instructions simple. Men like to keep cooking very simple. Offer simple, four step recipes for how to use the product on the packaging (for example, Hamburger Helper's directives are: add beef, cook, stir, serve).[15]

15 *Food2020. The Consumer as CEO*, Ketchum Global Food and Nutrition Practice, 2013.

Harness the Power of Food Evangelists

1. Gain their trust by marketing the health benefits of your food.
2. Provide transparency throughout your supply and value chain.
3. Provide access to information on how your products are grown and raised.
4. Create marketing strategy that includes more accessible food to families in need.

1. Male food buyer

Men are playing an increasingly important role in global food purchasing. Compared to the 1980s, men are responsible for 60% more food shopping. As a result, food companies are modifying their marketing tactics to go after the male buying segment.

2. Food Evangelists

The second is the shift in what or who is influencing consumer purchasing decision-making. In the past consumers relied on top-down marketing from food experts, governments, and food companies to guide their food choices. Now consumers are listening to fellow citizens and imitating what other consumers are doing and eating. "Food Evangelists" is a term that has been coined to capture this sentiment. Food Evangelists are consumers "responsible for driving dialogue surrounding the hottest food topics today." Food Evangelists are generally young, female mothers who are financially secure and driven by values more than value. By the year 2020, Food Evangelists expect the health benefits of a food to be more important to them than any other factor when it comes to food purchasing decisions. More than half of Food Evangelists would like to see food companies prioritize making healthy foods more available in the future, and want ingredient information about a product (including source, processing, production techniques, farm or supplier name, etc.) on product labels. Two-in-five Food Evangelists say that to recommend a food company to friends and family, the company would have to ensure quality food is accessible to families in need.[16]

16 *Food2020. The Consumer as CEO*, Ketchum Global Food and Nutrition Practice, 2013.

THE CHANGING FACE OF THE NORTHERN GROWER

The nature of new entrepreneurs = innovation & collaboration

Across the Northern Tier, we see a lengthy history of innovative, visionary farmers and food entrepreneurs. Despite continuous change over 300 years, often characterized by boom-and-bust cycles, Northern New Englanders found ways to make a living. **We emphasize the history of innovation continues today and offers an optimistic view of the future**.

Colonial and early American farmers, working in rock-laden soils for decades, learned to grow and produce such foods as wheat, sheep, dairy cows, laying hens, turkeys, apples and cider, and potatoes and whisky among many examples. As much larger farms and ranches populated the Midwest and Great Plains, often owned by enterprising former New Englanders, the North Tier increasingly lost the competitive battle of markets.

By mid-20th century, the Northern Tier prospered on timber, but many farms disappeared. The 1960s and 1970s saw a "back-to-land" movement of young, well-educated people fleeing cities, who arrived principally in Maine and Vermont, and then had to grow their food! Many of these individuals – Vermont's Ann and Jack Lazor, Alan LePage, and Joey Kline; Maine's Helen and Scott Nearing (also Vermont), Barbara Damrosch and Elliott Coleman – applied different strategies to farming, often drawing upon the earlier history of the land, because it worked.

In the 1980s and early 1990s, new farmers and entrepreneurs emerged around beer, bread, and cheese, often made from an array of organically-raised ingredients:

- Bread companies. O'Bread, Uplands, and La Panciata in Vermont; Borealis and Big Sky in Maine; and Orchard Hill Breadworks in New Hampshire.
- Breweries. Gritty McDuff's, Shipyard, and Sea Dog in Maine; NH's Smuttynose; and Vermont's Catamount (now closed), Burlington Brew Pub, and Otter Creek.
- Artisan cheese. Maine's Mystique, Seal Cove, and State of Maine; New Hampshire's Boggy Meadow; and Vermont's well-established firms like Cabot, Crowley, and Grafton Village and newcomers, Orb Weaver, Vermont Creamery, and Shelburne Farms.

Organizations like **Maine Organic Farmers and Gardeners Association**, the **Northeast Organic Farmers Association**, and the **Vermont Land Trust** arrived to support these many new directions.

Since 2000 the growth and diversification of new farmers and food entrepreneurs exploded. The authors highlight some of these new arrivals to describe and explain the recent growth.

A Commitment to Place and Community

While making a living is the foundation for success, many new entrepreneurs emphasize other values, often foregoing opportunities to expand and make more money (and incur more debt), to keep their businesses manageable, while ensuring they can enjoy family and friends.

Joel Alex of **Blue Ox Malthouse** in Maine expresses a strong community-focused ethic and believes that educating growers, processors, and consumers pays off multiple times at the local level. He sees great opportunities for value-added in rural communities and argues that Maine exports its raw materials and someplace else benefits from the value-added processing.

Janet and Nick Bartlett, owners of **The Local Hub** in Greenwood ME, echoed similar values. While living in Kansas, they grew food for their family and upon returning to Maine focused on Bethel area. Arguing the area lacks sustainability, since food comes from away and not local growers, they committed to building a new food system. Nick emphasized a commitment to build a stronger community and local economy.

In 2012, they launched The Local Hub on Route 26 a few miles south of Bethel. The store works with farmers and food processors within a 15 mile radius of Greenwood. Next door is a feed store selling seeds, soils, and fertilizers and people stop for both! Local farmers are looking for new markets and the store provides a key new outlet. For Nick, since consistency is essential, he works with growers to improve product quality. Route 26, the major north-south road along Maine's western border, sees year-around travelers from southern Maine and beyond headed to Sunday River or the lakes.

Reflecting their values, the store does not carry Pepsi or Coke, Budweiser or other national beer brands or cigarettes. The lack of these products doesn't seem to concern a steady stream of local residents. Many arrive to enjoy breakfast or lunch, made to order with an array of local ingredients. The chef makes breads, donuts, and pastries; pizza, sandwiches and burritos; sushi and sashimi! The Local Hub buy 55 – 60 dozen eggs a week @ $2.75/dz. and sell them for $3.75/dz., while the kitchen uses 10 – 12 dz. a week.

Entrepreneurial collaboration might be the hallmark in the area around Skowhegan ME. Once a vibrant mill town, by the late 20th century, the city suffered difficult economic downturns. However, over the past decade a number of new businesses opened, often by recent arrivals of people from away, that helped restore some of the town's economy. The farmers market, populated by local farmers, helped raise Skowhegan's visibility and attract shoppers to the community.

In 2011, Kelly and Mark LaCasse opened **Maine Meals** in Skowhegan. Kelly, a nutritionist and Mark, a chef, wanted to create take-out frozen meals for residents and visitors. Maine Meals prepares gourmet frozen standard and seasonal foods to go made from local ingredients. They buy from 35+ vendors at Skowhegan farmers market. They have a HACCP plan and process meat, poultry, and seafood for use in prepared foods. While the retail store accounts for 10% of sales, four farmers markets – Belfast; Rockland; Waterville; and Skowhegan; a contract at Sunday River Ski Resort; and other outlets much up the bulk of sales.

Ann and Andrew Mefferd own **One Drop Farm**, north of Skowhegan. They envision food with a conscience and are concerned about the moral basis of food. For them, these values translate into humane and ethical treatment of animals; food safety; food access and connections to community. They grow mixed produce and utilize hoop houses for fruiting crops, especially green peppers and tomatoes. Because of their background in geology, they want to utilize non-petroleum energy resources: wood or geothermal energy to heat the hoop houses. Locally, Pine State Drilling in Skowhegan does geothermal drilling. In addition to produce, they currently raise: eggs (300 layers); beef (Line back); and pork (Tamworth). By 2015, plan to add Katahdin sheep. The couple are part-owners of The Pick-Up in Skowhegan and Crown of Maine in Aroostook County. They sell farm products at two farmers markets in Waterville and Skowhegan and also to stores in the latter. Finally, Ann chairs the board of Maine Grains and is secretary of Skowhegan Farmers Market.

The Pick Up CSA & Café is located on the ground floor of the Somerset Mill. Sarah Smith, co-owner and founder, created an unusual CSA; rather than one farm, it incorporates a number of local farmers and growers. Sarah and husband Garin run Grassland Farm, a 50-cow organic dairy just outside Skowhegan. After joining Organic Valley in 2007, they quickly became one of the Coop's leading dairies: today, they are Organic Valley's 1st quality dairy in Maine and 4th overall in USA. The farm's milk goes to Stonyfield in New Hampshire for yogurt production.

In 2007, Sarah became manager of Skowhegan farmers market; it wasn't doing very well with 4 vendors. In 2013 they had 13 vendors selling produce, meat, cheese, and fresh pasta. Because the region experienced the arrival of a number of young farmers, the market wasn't large enough to accommodate new vendors. In 2010, she started working on ways to aggregate and distribute local foods from these growers. In 2011, Sarah and a partner, started The Pickup, a multi-farm community-supported agriculture business. They have between 40 – 65 growers, of which 12 – 15 raise produce. From April to mid-December, the CSA provides weekly shares and from December to March, bi-weekly shares.

Share baskets range in price and content:

- Garden Share ($25/week): A selection of fresh, local, seasonal vegetables and fruits plus one prepared food item.
- Plow Share ($35/week): A Garden Share with an added sampling of other local products. You

will receive bread every other week, eggs every other week, cheese once per month, plus maple syrup, apple cider and much more.

- Harvest Share ($50/week): A Garden Share plus weekly bread, eggs, and milk. Additionally, you will receive cheese every other week, weekly apple cider in season, honey, syrup, coffee, and much more.
- Half and Full Meat Share ($20 and $40/week): A selection of local meats, varying each week! This is a great way to try goat, lamb, or rabbit in addition to more standard beef, pork and chicken. Example: Half Share – Week 1: 1 lb. ground beef, 1 lb. pork sausage, and 1 lb. chicken breast. Full Meat shares receive double the quantities listed above.
- Shopper Select Share ($35/week commitment): Between Thursday morning and Sunday evening each week log into your account and select $35 of items you want! Everything from seasonal veggies and fruits to milk, eggs, and meats to breads and other value added items like cider, syrup, jam and coffee. You spend $35, but you choose. If you do not select by Sunday night you will automatically receive the Plow Share.
- Flower Share ($10/week): Available June 1 through September 30
- The multi-farm structure, while providing an array of foods to customers, allows each farm to specialize and take advantage of its unique soils and climate. In addition, to bolster quantities, some farms sell wholesale to the company. The Pickup wholesales to Maine General Hospital in Augusta; the products must meet the hospital's standards for quality and safety. The hospital offers a "food and farm safety" course to The Pickup's vendors and they offer CSA shares to hospital employees. In addition, The Pickup wholesales to Sugarloaf Ski Report; and the Goodwill- Hinckley School in Fairfield.

Another unique feature is the weekend Café operated by a chef-owner and seven part-time employees. The café sources 90% of its food from local growers.

The Pickup CSA generates 60 – 65% of the revenue with the rest from the café. The financials reflect a strong commitment by owners and members to local food:

2012: $89,000 farm products with a 28% wholesale margin

2013: $200,000 farm products with a 35% wholesale margin

Sarah sees a need for business boot camp to help educate farmers and make them aware of business requirements. Local growers want more markets, so one avenue is how to develop more creative marketing.

Overall, she see potential to process seconds, especially if it is organic. With both the Café and Maine Meals the expertise exists to develop array of minimally-processed foods. The most important questions are "What is the goal and how many people will actually buy?"

The Face of the New Farmer

In addition to the evolving face of food consumers, critical changes are occurring in producer demographics. A long term trend observed in the Census of Agriculture is the aging of farm operators. The average age of the principal farm operator increased roughly one year in each census cycle from 50.3 in 1978 to 58.3 in 2007. A majority of farm operators were between 45 and 64 and the fastest growing group of farm operators were 65

The Young Farmer Movement: Brown Chicken Brown Cow

A farm profile of the *challenges* for the young farmer movement

Excerpted from the farm's website. In 2012 Brown Chicken Brown Cow Farm was founded as a small, diversified farm run by two ambitious farmers, Jean Marie and Drew. Before deciding to follow their dream of becoming farmers, Jean Marie and Drew lived a more conventional life. Jean Marie started out as a biologist before finding the joys of working with children. She transitioned into environmental education, ultimately settling into a science teacher position at a Montessori school. On the side she apprenticed in herbal medicine and taught farm education. Drew started his career as an environmental engineer working on carbon offset projects. Not excited to spend his days in an office, Drew pursued his interest in the National Park Service and became a backcountry ranger in Alaska and on Mount Rainier. Despite successful careers, both knew they were destined to follow their heritage and become farmers. It took some time to gather the courage to quit their day jobs and pursue farming full-time but Jean and Drew cashed in their meager life savings and forged ahead. Although they had written business plans for the farm, and felt confident in their sales and markets, by the spring of 2014 the young entrepreneurs had run out of capital. The markets in the North Country did not support them as they hoped and were forced to leave the property they leased in Lancaster, NH. They made a huge effort to relocate the farm to southwestern New Hampshire where they hoped to find a more supportive market base but weren't able to find a property that met the farm's needs. The farm downsized and leased a temporary location but by March 2014 the farm had to move again and this time the farmers couldn't "bring five chest freezers with them." One of the farmers has decided to go back to work full time and is not interested in continuing the dream, while the other still hopes the dream can be had.

Photo Credit: http://brownchickenbrowncowfarm.org/

years and older.[17] These individuals are concerned about farm transfer and retirement, both of which shape the future destiny of American agriculture.

Meanwhile, a new generation of farmers is entering the profession, spurred by an entrepreneurial spirit, often mission driven, sometimes with a romanticized desire to reconnect with the land, and personal interest in the interplay between health and food. These individuals are often young, educated, urban professionals, who bring a diverse set of new skills and entrepreneurial energy into farming. However, these potential new farmers often possess little history or experience raising food. Many have no family history of working the land and have limited access to capital to acquire these resources. The 2012 Census of Agriculture revealed the number of new farmers, defined as less than 10 years as current operators, declined by 20% from 2007.

What can we do to help the older generation transition into retirement and assist the new generation enter into farming?

At the 2013 Vermont Farm-to-Plate Summit, Brian Donahue, professor at Brandeis University, presented "Vision 2060," a concept in which New England residents could access 50% of their food from the six states. Accomplishing this goal would require returning 2,000,000 acres of the region's land back to food production. Despite the many potential hurdles, across the region, people are discussing the vision's implications, opportunities, and challenges. Beyond land resources, when compared to other areas of the country, New England's abundant rainfall and fresh water are clear advantages. If the climate continues to warm, other areas of the country will be hard-pressed to maintain animal and crop yields; the country will have to grow food in other places.

In each New England state, dozens of organizations are becoming involved with agriculture and food. For example, a Maine Food Summit in December 2013 brought nearly 250 representatives together at University of Maine Orono.

Across the New England region, innovative approaches to marketing, sales, and distribution are evident:

- Development of online ordering
- Creation of micro-distribution programs and access
- Producers working together acting as common carriers for other farmers and processors.

Two very encouraging trends have been the overlap between environmental and conservation efforts with food access, social justice, and farm and food enterprises, and the rising desire from government, foundations, investor groups and private individuals to invest in agriculture and food. A new low profit limited liability corporation (L3C) designation bridging the gap between non-profit and for-profit investing has been adopted in some states, enabling mission driven corporations to accept funds from a variety of sources.

17 agcensus.usda.gov/publications/2012/Preliminary Report/Highlights

As an example of the breadth of non-traditional financial support, established in 2010, **Slow Money Maine**, part of the national Slow Money movement, has attracted more than $8,000,000 in food related investments. Slow Money Maine sees itself as a convener with a cross-sector approach to link farmers, processors, distributors, communities, and funders. In May 2014, they organized the first Slow Money regional gathering with presenters and workshops from across New England. A new **Slow Money Vermont** group collaborates with the Vermont Sustainable Jobs Fund "Flexible Capital Fund (L3C)" and Clean Yield Asset Management to bring together funders and food related entrepreneurs.

Other essential financing programs include:

- Vermont Farm Viability Program funds business planning and implementation grants
- Vermont Working Lands Enterprise Initiative. Legislative commitment to **invest approximately $1 million** annually in grants for agricultural and forestry based businesses.
- Vermont Agency of Agriculture Food and Markets grants
- NCIC technical assistance grants
- New Hampshire Community Loan Fund technical assistance grants and loans
- Foundations such as Surdna, Cedar Tree, and Harry Chapin.
- Maine Farms for the Future Program funds business planning and implementation grants
- CEI (Coastal Enterprise Inc.) is involved in the agriculture and food investment area, "probably deploying $5+ million into the sector this year, primarily but not exclusively in Maine (we have some regional scope). More than $1 million into 'food hubs.'"[18]
- USDA Value Added Producer, Rural Business Enterprise Grants, Specialty Crop Block Grants, Local Foods promotion Program, and Renewable Energy for America grants
- USDA Farm Services Agency value-added grants, especially for new and young farmers.
- Wholesome Wave. Helping to support food access through double-value coupon program (DVCP). In Vermont working with food hubs and through Northeast Organic Farming Association, the DVCP; likewise, in New Hampshire and Maine, the DVCP is key.
- Sam May of Slow Money Maine is working on a farm focused credit union.
- Whole Foods Market. Provide grants and loans to companies with whom they do business. Through its "Local Producer Loan Fund," Whole Foods helped Vermont Creamery's Ayers Brook Goat Dairy; and MOO Milk.

18 Interview with Daniel Wallace. August 29 2013

Future potential: a vision for mid-21st century New England

In 2012, a group of scholars from Massachusetts, Maine, Vermont, and New Hampshire set out to create a New England "**Good Food: Vision 2060**." The vision calls for 70% of New England to remain in forest, while as much as 15% of the landscape (some 6 million acres) is reverted to farmland, tripling what we have now.

The Executive Summary of the **Good Food: Vision 2060** report as excerpted here:

> *"Wildlands & Woodlands 'Good Vision' for Local Food and Farming in New England"*[19]
> *By Brian Donahue. April 2012*
>
> - *A slow rate of population growth with most people remaining urban and suburban*
> - *A healthier diet, following USDA and Harvard School of Public Health guidelines: fewer calories, less red meat, more fruits and vegetables*
> - *Higher energy costs and serious efforts to reduce our carbon footprint*
> - *"Sustainable" practices aimed at reducing the environmental impact of farming*
> - *Expanded farm acreage that fits within the boundaries of vigorous forest conservation*
>
> *The resulting landscape would resemble the early 20th century, when New England farmers supplied urban consumers with products that were costly to ship long distances. Many of the same crops and strategies from the early 1900s make sense today and they argue we could:*
>
> - *Grow almost all of our vegetables, and about half of our fruit on about 1 million acres surrounding our cities. When grown in other parts of the country, these crops use a considerable quantities of water, energy and agricultural chemicals. Local production yields large benefits in freshness, utilizes recycled nutrients, and engages more people with the food they eat.*
> - *Produce all our dairy and beef on about 4 million acres of well-managed grass in New England. Because New England's climate and upland soils are good for pasture, we produce healthier cows and milk with lower energy, fertilizer, and feed costs and can revive an attractive pastoral landscape.*
> - *Produce all of our pork, poultry, and eggs outdoors on pasture; a healthier, tastier, and more humane approach than raising these animals in confinement. We would grow only a modest portion of feed grains and some grain, beans, and oil crops for human consumption, since they are sensible, energy-dense products to import.*
>
> *New England farms could produce about half the region's food without sacrificing huge forest areas. By focusing on crops we grow at home, while connecting with sustainable agriculture elsewhere, we have the chance to help create a healthier local and global food system.*

19 **http://www.wildlandsandwoodlands.org/. www.foodsolutionsne.org/sites/foodsolutionsne.org**

LOCAL AND REGIONAL MARKETS

Within the study area, a variety of population nodes exist, some of which are well-served, while others offer great potential as new markets. Opportunities exist for small farmers to sell to institutions, retailers, and restaurants. Of particular concern, however, is consistent quality, quantity, and timely deliveries and both farmers and potential clients need education about the needs and challenges for each. Beyond population centers, key groups emerge for specific types of food. The local food movement makes a big difference in consumer attitudes. Young people, especially buy local, good food and use more of their disposable income on food.[20]

Regarding local and/or regional markets, the team's data collection and interviews point to further research in key market regions as follows:

In **Maine,** key urban populations are in Auburn/Lewiston; Augusta; Portland; and Kennebec; other potential markets include **Sugarloaf and Sunday River Ski Resorts in Franklin County**. The **Maine Grocers and Food Processors Association (MGFPA)** sees significant growth in small family farms in the state. The 2012 agriculture census shows 8,100 farms, many of which are organic and/or diversified. Maine is attracting a new population of 20 – 30 year old farmers; the millennial generation has strong entrepreneurial spirit and energy. In 2013, working with the **Independent Grocers Association,** MGFPA launched a **local foods in small-scale groceries program** that shows real progress.

Shelly Doak, the MGFPA executive director, argues **consumer education is the foundation** for any and all change. She is very concerned that all major food wholesalers are located out of state and therefore, do not see the potential for locally-grown foods. Access to capital remains a pressing problem; in Maine the slow economic recovery and lender concern over risk means less investment and loan funds available. In addition, a decline of large employers in major sectors – timber and Bath Iron Works, for example – means Hannaford's and Walmart are the state's top two largest employers, followed by L.L. Bean and Maine Medical Center.[21]

Maine counts more than one hundred specialty food producers and the number continues to grow as new entrepreneurs open new businesses. Cathe Morrill, president of Maine Grocers and Food Producers Alliance, believes the Kneading Conference, by helping to elevate the state's visibility around grains and milling, contributed to new businesses, especially bakeries. Cathe oversaw the merger of the grocers and food producers associations; in her opinion, both groups shared a vision to get good Maine food on Maine tables. She and Shelly Doak believe the new association can help increase market share in Maine and develop greater opportunities in Southern New England and Mid-Atlantic states.[22]

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20 Interview with Jessie Dowling. Fuzzy Udder Farm. October 23 2013.

21 Interview with Shelly Doak. MGFP. April 18 2014

22 Interview with Cathe Morrill. April 2 2014

John Harker, Director of Market Development, Maine Department of Agriculture, sees a shift in diet and nutrition as a key driver for fresh food and argues everything from farm stands to restaurants to supermarkets will source more fresh or minimally-processed foods. He feels the trend may lead to an increase of home cooking and perhaps a new emphasis on home economics, including food preparation, storage, and preservation.

Mr. Harker and Tanya Swain, executive director of **Western Mountains Alliance**, think **buying clubs and food Coops** are potential new consumer forces, since both arrangements can lower prices for consumers. Buyers' clubs are comprised of individual owners with a coordinator to help with purchasing and many Maine clubs use online ordering systems.[23]

One buying club, **Farm Fresh for Maine** is joint venture between Maine Department of Agriculture, Western Mountains Alliance, and others to support creation and growth of buying clubs:

"Farm Fresh for ME embraces the concept of consumer food buying clubs. A consumer food buying club pools the demand of several households, allowing them to purchase larger quantities of food at less than full retail price. Local food buying clubs are a wonderful way to help Maine farmers sell more products in a more organized, collective way. Farm Fresh for ME pilot an innovative buying club model in Readfield where Maranacook Area School's support enabled student involvement in the project and a distribution site at Maranacook Middle School."[24]

Some concern expressed that markets for many artisan products may be saturated in Maine:[25]

- Produce production is over-saturated
- Fermented foods – cheese, beer, vegetables – maybe over-saturated
- Poultry – still offers opportunities, but high production costs are a limiting factor.

The **Maine Network of Community Food Councils** (MNCFC) works to create local food systems and develop a statewide structure to share information and ideas. The organizations want to create broader, stronger distribution networks across the state and see significant opportunities to market and sell locally. Councils are active in Oxford and Franklin Counties: Community Food Matters in Oxford Hills (southern half of county) identified approximately

23 Interviews with Tanya Swain. September 4 2013 and John Harker. February 5 2014

24 **Farm Fresh for Maine**

25 Interview with Jessie Dowling.

100 growers. Local Food Matters in Bethel (northern half of Oxford County coordinates activity, while Farmington is the hub for Franklin County.

Maine interviewees agreed in general that Oxford County has more farming and food activity than Franklin County. One issue is land access and availability in Western Maine, because the preponderance of large holdings makes it challenging for small producers to buy property. The large potato growers have long term contracts with Frito-Lay and are unlikely to shift production in a different direction. The problem is not to link new farmers to land… it's having land available. Without a land conservation group in western Maine, few opportunities exist to buy reasonably priced parcels suitable for small scale operations.[26]

Amy Scott, coordinator of the Bethel **Local Food Connection** in far western Oxford County sees several exciting possibilities:

- Given the number of dairies in Bethel area, she sees an opportunity for small bottling operation.
- Franklin County has several excellent meat products and West Gardiner Beef, while outside of study area, slaughters animals.
- Several county school lunch programs buy local foods.
- Gould Academy in Bethel has 240 students, including international ones. Founded in 1835, the academy is a private, co-ed, college prep school.
- She is working on a collective project with Franklin and Oxford counties' restaurants.
- MNCFC organized several "meet the buyers" gatherings that proved very successful.

Ken Morse, MNCFC coordinator, is optimistic about future of agriculture in Maine and points to young people who want to become farmers. In addition, he sees the food council movement and FoodCorps (AmeriCorps model) as essential components to a successful farm and food economy. Ken thinks the development of online ordering and creation of micro-distribution programs and access will expand opportunities and streamline businesses development.

He sees untapped markets for institutional sales, especially hospitals and colleges. His major concern is most farmers are not scaling up production, but seem content with selling direct. For him, the question is **how to encourage growing for wholesale markets** and thereby expand access and the geographic range of Maine products.[27]

Farmington, the largest city in Western Maine located in Franklin County, sits astride **US Route 2, the main east-west highway through the study region**. The city's population is 7,500, of which 1,800 are students at the University of Maine Farmington (UMF) campus. UMF sponsors a Fiddlehead Festival in May to bring residents and students together around food. The University's president wants to see great percentages of local food on campus; currently, Aramark handles food service and sources approximately 20% from Maine. Student demand

26 Interview with Amy Scott. December 22 2013

27 Interview with Ken Morse. October 3 2013.

for organic, local, and GMO-free foods may change how the company and university work together in the future. Luke Kellet, an ecologist and the university's sustainability coordinator, said vendors and students need education and Aramark must develop better marketing to students. The three UMF faculty interviewed for the NCIC study expressed a need for successful ideas and models to help shape and implement change on campus and in the city.

Mobilize Maine parallels MNCFC as an economic development agency; the group coordinates seven economic development regions within Maine. Executive Director Mark Ouellette recognized farming and food production are key economic drivers in Maine said the following:[28]

- Critical need for aggregation facilities and programs. In Maine, because most farms are small to medium-sized and often spaced widely apart, aggregation businesses or other entities are important to future growth.
- See institutional buying as important component in the future.

Portland

The city's farmers market is a very important outlet for a number of Maine farmers and food producers. Because many of them sell at the city's two weekly markets, they make deliveries to Portland restaurants as well.

Portland mayor, Michael Brennan, created Mayor's Initiative for Healthy Sustainable Food Systems. The city's school system serves 15,000 meals; by 2016, the goal is to source 50% of Maine-grown foods: "Last year, the kitchen served 50,000 pounds of local produce and 15,000 pounds of local meats. This year, the kitchen is on track to double those amounts, according to Blair Currier, the School District's local food specialist."[29]

Rosemont Market and Bakery

In 2005, John Naylor and Scott Anderson, co-owners, established the first Rosemont Market. With prior experience in retail food stores (John worked for the Greengrocer), both men understood the difficulty of creating a successful food business. From the outset, they made a commitment to buy as much Maine grown and processed products as possible. The store was a success from day one and the business experienced growth every month since opening. Today, Rosemont comprises four markets and a bakery in Portland and Yarmouth ME.

An example of how they operate is found at the Brighton Avenue market. The corner location is reminiscent of stores from the 1950s. It has an intimate feel, great aromas, and excellent staff; you almost expect to see sawdust on the floor. Across the street sits the large bakery operation that supplies the four stores with fresh baked items and prepared ready-made foods. Rosemont grosses 30 – 40% of annual sales through bakery products and prepared foods. The company owns all of its buildings, so capital assets grow each year.

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28 Interview with Mark Ouellette. February 17 2014

29 "Farm to School Portland on Pace to Double Amount of Local Food." *Bangor Daily News.* January 29 2014.

They pride themselves on locally-sourced fresh, frozen, and processed products. The company buys produce from **Farm Fresh Connection** (Freeport) and **Crown of Maine Organic Cooperative**. They are actively looking for ways to collaborate with colleagues to bolster the distribution network in the state.

In 2007, they bought a warehouse along the riverside to manage deliveries and distribution to stores. Previously, farmers would visit each store, so everyone faced difficult management tasks for logistics, inventory control, and administration; farmers might spend several hours to complete deliveries. The warehouse gives farmers a one-stop delivery and the company then transfers farm products to appropriate stores. In addition to individual deliveries, Rosemont receives product from Farm Fresh Connection and the Crown of Maine. Ultimately, they want the warehouse to function as a food hub.

When they started in 2005, John and Scott had 5 – 7 employees. Today, they have 70 employees and gross $7.0 – 7.5 million annually. In addition to the multiplying effect through salaries, they buy local insurance, contract for HVAC and plumbing services, and send all food waste to local compost business. The company buys at least $2.0 million worth of product from local farms.

Beyond produce, Rosemont purchases meat from a number of Maine growers. At Brighton Avenue, a butcher divides carcasses for distribution to other outlets. Every week, the company moves approximately 1200 – 1500 pounds of beef and 1000 pounds of pork through its stores. The store works with farmers to improve genetics, feed, pasturing, humane practices, and environmental practices to insure top-quality meats and benefits to soil and water.

John Naylor sees an increase in medium-sized farms and argues Maine's history of truck farms can be revitalized. John points out Maine soils are ideal for growing asparagus and lettuce and thinks potential markets them. He contends farms in the 30 – 50 acre range can make money, especially when compared to the West Coast. Beyond the current problems of drought and water for irrigation, the cost to move produce from West to East coasts now runs $13,000 – 15,000 per shipment! While local markets can absorb increased production, John feels Boston, Hartford, and Springfield are legitimate market opportunities for Maine goods.[30]

In New Hampshire key market areas are Concord; Hanover; Lebanon; Littleton; Manchester; and Nashua.

Littleton Food Coop

The Littleton Coop is a new Coop having only opened in 2009 with a 13,500 SF store convenient to both the downtown and I-93. For the Keep Growing project, the Coop produce and general managers provided their insight on needs, challenges and opportunities for local growers. At present the store feels it gets all the "basic" local produce and "higher cash crops" such as tomatoes and cucumbers, it needs. The opportunities lie in finding something the Coop doesn't carry and making it available, such as local cauliflower, wax beans, Brussel sprouts, or asparagus. The Coop works both with distributors and direct sales with growers, preferring the direct relationships, "[they are] easier and more fun!"

30 Interviews with John Naylor, December 5 2013 and January 27 2014.

The Littleton Coop buys from 70-90 growers, 20-30 in any given week with 70% of their local product coming from 10 suppliers. Each year, the Coop holds a grower's meeting with the ten suppliers to organize who will grow which main crops to ensure diverse crop selection and create a produce schedule for the season.

Coop Food Stores (Hanover and Lebanon NH and White River Junction VT)

The Coop Food Stores, founded in 1936, have been at the forefront of local food buying for many years. From a single location in Hanover, the Coop Food Stores expansion to four locations in the Upper Valley, represent a **great resource for consumers, but more limited opportunities for new growers**. Similar to the Littleton Coop they have a good repertoire of existing local producers. These growers supply most of the produce items the Coop needs in season and meet with the Coop annually to create a schedule of who will be growing what, when. The store anticipates most growth for local in the form of foods other than fresh in-season produce, such as meat, dairy, grains, and value-added, along with out-of-season or processed produce. Opportunities will most often present themselves in the form of items the store does not yet carry or special requests by customers. The Coop does buy direct from producers but often prefers to source local products from distributors and aggregators to streamlines deliveries.

Concord Coop

As the state capitol, the City of Concord has a mix of food shopping outlets and restaurants. One of the most noteworthy businesses handling local food is the **Concord Coop**. Evolving from a community buying club, the Coop was established in 1982. After occupying several buildings, in 1993, it moved to present location on Main Street. In 2005, the store tripled in size and doubled the number of products for sale. While Coop has between 5,000-6,000+ members, it does not have any member workers. In 2009, the Coop bought the building and three years later undertook an expansion project; they operated during the renovations and sales dropped 13%. In 2013 they witnessed 30 – 40 % growth.[31] The Coop managers see opportunities to buy greater amounts and diversity of foods.

In early December 2013, the store had a number of excellent signs – photos and text – to promote its growers:

- Mike Smith
- Hillside Apiaries
- Sad House Meadery
- Diamond Hill Farm, Concord. Integrated Pest Management farm. Runs a CSA, farmers market, and wholesales to nearby clients.
- Generation Farm

Examining the Coop's December 2013 list of NH and regional foods, showed 259 suppliers, 105 of which are from NH and 154 from the surrounding region. They need locally farmed and processed vegetables, especially during the winter; they could sell considerable amounts of minimally-processed, frozen local vegetables.

31 Interview with Shawn Smith. December 4 2013

The Coop sees a bright future ahead, in part a result of greater interest in New Hampshire foods and the construction of new housing in Concord for luxury units as well as artisans and low-income people.

The Coop operates a hot and cold bar for prepared foods and private catering and wedding businesses. They offer "green stamps" to shoppers: $10.00 = one stamp, all of which are redeemable in the store. They take full advantage of social media – Facebook and Twitter – to advertise and inform community. In addition, the Coop provides blogs for farmers and community to share experiences, ideas, and stories.

One striking statistic is that **30% of revenue comes from health and beauty products**, many of which are manufactured in NH. For example:

- MegaFood. Londonderry NH. Established in 1973, the company's Trademark is *Fresh From Farm to Tablet*. "MegaFood has been a pioneer in the whole food supplement movement by launching more than 50 varieties of whole food supplements designed for men, women and children. The company was founded on a fresh idea that dietary supplements could be made from farm fresh whole foods."[32]

Rather than create **separate Vermont market descriptions, detailed information for Brattleboro, Burlington, Montpelier, Newport, and St. Johnsbury appears throughout the report**. Likewise, we highlight regional markets in Boston, Hartford, Springfield, Providence, and New York City in various places, for example in the following discussion of Whole Foods Market.

Does Whole Foods Markets fit into a Northern Tier marketing and sales strategy? The chain has two regions that offer opportunities to study area farmers and producers: North Atlantic, Northeast, and Mid-Atlantic (see appendix IV for details on regional offices). Currently they have 60 stores in New England with 2 stores planned for NH; Nashua in August 2014 and Portsmouth in 2015 and four new stores in MA. In spring 2014, the company opened its first upstate NY store in Albany. Whole Foods sets high standards for its products and require all farmers and food producers reflect its philosophy about food, environment, fairness, etc.[33]

Since individual stores have broad decision-making authority to buy products, each one reflects its particular definition of local. Depending upon the geographic boundaries, stores may source from just a few miles or many.

Among the Northern Tier products sold in regional stores:

In early 2014, Whole Foods began sourcing Maine Grains Red Fife flour in retail packages and 30 tons bulk flour for its bakehouse. Originally developed in Canada as a hard winter wheat, more northern farmers now grow Red Fife. Maine Grains' original plan was to buy the grain from Aroostook County, but weather compromised the source and they bought grain from Gianforte Farm in Cazenovia NY. The Medford MA bakehouse, formerly Bread & Circus, made a Red Fife honey baguette to sell at 60 stores in southern New England.

32 http://**www.megafood.com**/

33 Interview with Lee Kane. EcoCzar/Forager; Whole Foods Market. April 7 2014

While buying a fair amount of **artisan cheese** already from across New England, the company continues to seek out new products. They buy from Jasper Hill and VT Creamery in Vermont. In spring 2014, they experienced a goat cheese "logjam" with too many options available. The company's purchasing pattern includes national, regional, local, and individual stores. **One key option is they will buy any amount at any time, opening a door for small producers to "break in" without major commitment of product**. They use multiple delivery options from Whole Foods trucks to distributors to direct ship. The company works with Deep Roots Organic and Crown of Maine.

Although the company buys produce from northern counties of Maine and New Hampshire, they do not considered it local. They buy hothouse tomatoes from Backyard Beauties in Madison ME and through Red Tomato, they buy Eco-Apples because it features heirloom fruit.

Whole Foods helped create and follows the **Global Animal Protection (GAP) guidelines for its basic protocols. All growers must conform to these criteria**. For North Atlantic stores, they buy the following proteins:

- Beef: all New England states.
- Pork: Vermont is a major supplier through Westminster Meats.
- Lamb: North Star Sheep Farm, Windham ME
- Turkey: Misty Knoll in New Haven VT
- Poultry often presents challenges to growers because of Whole Foods' protocols
- Duck: Maine-ly Poultry and Maine Common Wealth Farm
- Rabbit: in spring 2014, company began test marketing in 3 – 4 stores. If successful, rabbit may offer opportunity for study area farmers.
- Venison: not much demand currently

The company has interest in the following products:

- Value-added dairy:
- Kefir. Currently buy from Butterworks Farm
- Goat butter
- Ice cream: "super" local approach
- Yogurt: Blue Hill Yogurt in the Berkshires. They source milk from their farm and others in New England. Company is an offshoot of Dan Barber's well-known Blue Hill Restaurant in NYC and Blue Hill at Stone Barns. It makes savory yogurts from beets, carrots, sweet potato, parsnips, and other ingredients. Whole Foods seems to be their sole outlet, but the yogurt appears in dozens of store from Louisville, Cleveland, Virginia Beach to Portland ME.

Whole body department

- Medicinals
- Aromatherapy
- Botanicals

Eggs – must follow GAP protocols

Fermented beverages: beer, cider, kombucha, and spirits

Fermented vegetables: buying from Real Pickles

Craft soda

Creating a Local Market

Northeast Kingdom Tasting Center. Newport VT: An Example of Success and Challenge

In August 2013, the Northeast Kingdom Tasting Center opened in Newport VT. Eleanor and Albert Leger, owners of Eden Ice Cider, and Michel Lemieux, co-owner of Brown Dog Enterprises, were the visionaries and key partners to launch the Center.

Several years ago, while exploring the expansion of Eden Ice Cider the Legers realized they had an opportunity to create a facility to showcase the people and products of Vermont's Northeast Kingdom. Originally, they considered Danville and St. Johnsbury because of transportation access, but neither are major destinations.[34]

Newport on the other hand offered several **advantages**:

- The City of Newport was enthusiastic and very supportive of the project.
- The city's strategic plan enabled it to receive "designated downtown" status that attracted outside resources.
- USDA Rural Development through its Rural Business Enterprise Grants program helped pay for the building and kitchen equipment
- A very good labor force exists in the city and surrounding area; while small in comparison to other places, the people live here because of the lifestyle and are willing to trade some income for place.
- Setting and natural resources. The city sits on the southeast shoreline of Lake Memphremagog, a body of water that overlaps both Vermont and Quebec. To the west is Jay Peak with its extraordinary skiing and recreational attractions.

34 Interview with Michel Lemieux, September 2013. Interview with Eleanor Leger, May 16 2014.

- The planned new economic development projects in Newport, spurred by Ariel Quiros and Bill Stenger, include a biotechnology company and upgrades to the Newport State Airport. Much of the necessary capital comes through a federal foreign investment program, entitled EB-5 Investor Green Card (individuals invest $500,000 and create a minimum of ten new full time jobs in exchange for a green card to enter the United States)[35]. The biotech business will employ dozens of new workers and contribute directly to the city and region's economy.

- Sterling College in Greensboro contributes important agriculture and environmental educational opportunities. Recently, the school initiated new food production programs with local artisan businesses and brought in internationally-known experts to teach and lecture.

- Green Mountain Farm-to-School is one of the best in the state. The program distributes to schools, prisons, and food service. They are considering a restaurant as well.

- High quality producers are located nearby:
    - Eden Ice Cider. West Charlestown
    - Bonnie View Farm. Craftsbury Commons
    - Jasper Hill Farm and the Cellars at Jasper Hill. Greensboro
    - Hill Farmstead Brewery. Greensboro
    - Spring Hill Farm (beefalo). Orleans
    - Tangletown Farm. West Glover
    - Parker Pie Company. West Glover
    - Sweet Rowen Farm. West Glover
    - Brault's Slaughterhouse. Troy

"Planning for The Northeast Kingdom Tasting Center project is partially funded by a Vermont Community Development Program grant award from the Agency of Commerce and Community Development, and by a USDA Rural Business Enterprise Grant through the Northern Community Investment Corporation."[36]

The center is located at 150 Main Street in a former "5 and 10" and retains some of the old building's charm. A feasibility study projected renovation costs at $2.7 million, far beyond the investors and grants ability. Although architects suggested a lower price, not until a contractor was hired could they really reduce the price. The renovations cost $850,000! The equity of $562,000 was leveraged with $750,000 in financing from Newport's Community National Bank and Vermont Economic Development Authority (VEDA). Eleanor Leger and Gemma Dreher, a Newport resident and attorney, are the managing partners.

Sixteen individuals, including the Legers, are investors and two foundations purchased equity shares in the holding company (Northeast Kingdom Tasting Center, LLC). Canadian Michel Lemieux, co-owner of Brown Dog Enterprises, leveraged his involvement through an E2 visa (investing sufficient to develop a successful, non-marginal business (generally considered a minimum of $150,000) and employing at least five full time staff to receive a two year, renewable non-immigrant work visa

35 http://**www.whicheb5.com/blog/e-2_investor_visa_eb-5_green_card**/

36 Northeast Kingdom Tasting Center Website. http://www.nektastingcenter.com

to enter the United States).[37] He did not have the financial resources, but with so many different businesses in the Center, he exceeded the employee quota and was granted a visa.

The Center houses four local food and beverage businesses that feature products from the region:

- Brown Dog Bistro and Butcher Shop (Brown Dog Enterprises), owned by Steve Breault and Michel Lemieux.
- Eden Ice Cider Company. Cider, Wine & Cheese Tasting Bar and Shop on the main floor, and will move cider production in the basement.
- Jocelyn & Cinta's Bake Shop.
- Butternut Mountain Farm retail store with Vermont maple products. BMF purchases bulk syrup from between 30 and 50 Northeast Kingdom sugarmakers every year. This is their second retail location with another one in Johnson, VT.

Opportunities and Challenges

The Tasting Center survives because of **tourist traffic**, since the perception is most products are too expensive for local residents to purchase on a regular basis. The majority of visitors come from New York City, Staten Island in particular, with others from Boston and Quebec. When the center opened in late summer 2013, a sizable portion of "high" season was over and the Center missed a key opportunity to create visibility with visitors. A long 2013 - 2014 winter added to very slow sales.

During this period, Michel Lemieux said it was very difficult to keep everything afloat. His other Newport store, Newport Naturals, has a 30 year presence and loyal, local clientele that shops regularly throughout the year. The tasting center does not have brand identification or loyalty, even though oddly, the natural food store's prices are not very different from the Tasting Center nor the types of products offered for sale. Even the shoppers are similar: a more affluent, health conscious demographic. Yet for some reason, the owners feel the natural food store can attract locals as regular shoppers but the center doesn't or can't. Exploring this a little more would be interesting.

How to manage in-store products at the Center also remains an ongoing challenge. All of the businesses struggle to balance prices to be affordable to consumers yet provide a fair return to farmers. **The same issue shows up repeatedly across the study region from diverse businesses: can local food be affordable yet also provide a decent living for the producers?**

37 http://www.whicheb5.com/blog/e-2_investor_visa_eb-5_green_card/

REGIONAL BRANDING

In exploring the need or benefit of implementing a "Northern Tier" regional brand, we discovered many different definitions exist over what a regional brand initiative might consist of and what current regional brands achieve. Because of these key elements, we found **varying levels of interest to establish a new brand**. Many organizations questioned the feasibility and value of a new regional brand, while others felt it would add credibility and cohesiveness especially for the region's smaller producers who want to expand into greater regional or commercial markets.

Most interviewees were unsure about markets beyond the region at this time. They see a need to **develop more diverse, stronger local markets for small producers** with some regional options. As soon as they expand beyond state borders, other issues arise. If these challenges could be met, opportunities exist to strengthen our regional presence in the Mid-Atlantic States and possibly Quebec.

Across the region are many examples of aggregated branding projects and different approaches in which these efforts work to accomplish their missions. The overriding objective of these "regional" branding initiatives, however, appears to be the same: they want to support regional producers' efforts to sell more product. Some programs focus on visibility or transportation, while others incorporate actual sales venues for their members. To summarize state and regional initiatives, we outline the status of current regional brand initiatives.

Vermont

At present no statewide branding program exists in Vermont. Previously, the state operated a Seal of Quality program run by the Agency of Agriculture Food and Markets. The program aimed to promote Vermont products; members, by adhering to strict quality specifications, were eligible to use the coveted logo on packaging, sales, and marketing materials. The program was founded in 1977 but by 2010 the Vermont Seal of Quality program was languishing amidst confusion on the part of producers and consumers and lack of funding for regulatory oversight, rule development, and advertising. In 2011 the state commissioned a market research study to explore the program and how best to promote products from Vermont. The study discovered members of the program preferred new investment be used to hire a dedicated Vermont Agricultural and Specialty Products Brand Ambassador rather than restart the regulatory oversight program. This brand ambassador could assist retailers to source state products, create aisles and displays, merchandise products and displays, and coordinate a strong presence for Vermont products at industry tradeshows and other events. A brand ambassador position was easier to manage based on funding availability than a program who could be (and was) misused when funding wasn't available for oversight.

New Hampshire

New Hampshire maintains a statewide branding program, *New Hampshire Made*. The program is supported by a website with online shopping capability, point of sale materials, and a logo for members to use. Two State of New Hampshire Retail Stores in which members can retail items, are located on I-95 in Hampton, NH; and members can sell products at events and trade shows through a *New Hampshire Made* booth.

Maine

Although the State of Maine has no official branding program, a few independent branding programs exist. These include "Crown O' Maine Organic Cooperative", aggregating, distributing, and reselling Maine grown products to most parts of the state, southern New Hampshire, and the Greater Boston area. The Maine Family Farms company aggregates and resells Maine raised beef throughout most of New England. In Skowhegan, Maine Grains buys and grinds local grains for sale throughout the region.

Quebec

The Province of Quebec makes significant use of **place based branding**. The province not only maintains a program, but areas within Quebec also have regional branding programs. Within the programs, membership is divided into producers and processors whose food is **grown in Quebec** and manufacturers whose **production occurs** in Quebec. To receive the "**Grown in Quebec**" designation, products must contain 85% of its ingredients from the region, while the brand "**Produced in Quebec**" requires 100% of the raw ingredients are processed in the province, whether sourced from Quebec or otherwise. The branding program includes promotion, logo and point of sale materials, paid advertising, and organized promotional events. According to the provincial government, **70% of Quebecois stress the necessity and importance to identify products produced in Quebec at point of sale. The authors recommend NCIC set a goal in which 70% of our population demands local products.**

To support the promotional programs, regions founded nonprofit distribution entities that work in parallel with marketing and promotion For example, Saveurs des Cantons, is the nonprofit sister organization, the distribution entity, to Créateurs de Saveurs, the regional branding program. The distribution entity with 30 producer members and more than 700 products represented, operates via a web-based ordering system.

Potential Challenges and Opportunities with Other Regional Brands

Catskill Mountains New York

In a 2013 study for a possible new Catskill Mountains cheese producer, revealed interesting **perspectives about the value of branding** in New York City and other major urban markets. "**No consensus emerged about the**

value of a Catskill brand or a specific cheese name or label with the Catskills mentioned. For a few retailers, the Catskills as a brand and place may contribute to higher visibility, but many raised a broader question about New York State cheese quality and market perception. Their consumers perceive NYS cheese as commodity, industrial products, not artisan. This perspective has a long history, since Rome NY was the site of the nation's first industrial cheese factory in the 1850s. Today, large companies like Cabot, McCadam, Yancey's Fancy, and others help perpetuate this view; the state produces commodity dairy products including cottage cheese, mozzarella, and yogurt, especially Greek-style.

Even though New York accounts for the most artisan companies nationally, with ones like Coach Farm, Northland, Nettle Meadows, or Hawthorne Valley, the retailers feel overall state quality is not yet on par with other states. With Vermont so close with many outstanding cheesemakers, New York State producers have a visibility challenge and a much higher level of quality to reach before people ask first for an Empire State cheese.

One retailer believes an IGP (indicator of geographic production) or DOC (*Denominazione di Origine Controllata* or Controlled Denomination of Origin) designation could be very useful. If a Catskills label is used, he recommends Catskill Mountain Cheese Project **identify and articulate the region's unique terroir** characteristics – geography and climatological features. In addition, working with indigenous micro-flora might create very unique products identified with the Catskills."[38]

The authors conclude the concept of an IGP designation across the Northern Tier, reflecting the area's unique physical attributes, deserves further study and analysis by NCIC. While a new **Northern Tier brand has potential for sales and marketing**, **quality and consistency** are the most important factors for distributors and retailers to choose a product. This important concern must be explored with any markets NCIC producers may consider. If NCIC's Northern New England producers want to develop a regional brand, we must ask "how is the quality of the region's products perceived" and "do we need to address the perception of the region's quality before promoting the region as a brand?"

Furthermore NCIC or other agencies must consider not only promotional elements but also sales support needs such as retail storefronts (either brick and mortar or internet based) and how to provide transportation, distribution and aggregation logistics. Successful regional brands focus on branding and awareness and are actively involved in sales and distribution for their members.

Beyond these considerations, the **concept of terroir** points to a potentially significant approach to **grow and raise unique agricultural products** and **market** them to discriminating consumers.

38 Jeffrey Roberts. "Catskill Mountains Cheese Project Market Study." 2013

DISTRIBUTION

Concerns about transportation and distribution logistics characterized many interviews, as well as other studies previously conducted across the Northern Tier. Beyond such corridors as US Route 2, Interstates 91 and 95, and a few other highways, the region is not well-served by convenient roads. Geography and long distances are a constant barrier for any farmer or food producer. And yet, several small distributors deserve recognition for innovation and collaboration. The **authors recommend highly the distribution models created by Farm Fresh Connection and Red Tomato**.

Farm Fresh Connection. Freeport ME

In the late 1990s, the Maine Sustainable Agriculture Society and Maine Organic Farmers and Gardeners Association, saw considerable demand from Bates and Bowdoin colleges for greater access to local foods. However, since without any distribution infrastructure the schools could not fulfill the demand. In 2000, the Society received funds through Common Good Ventures part of the Maine Community Foundation, a philanthropic investors group, to focus on wholesaling foods to institutions. In partnership with Maine Organic, they created **Farm Fresh Connection** and hired Martha Putnam to run the operation.[39]

In the first year (2000) they did $10,000 in business with 15 – 20 growers and 1 employee (Martha). By 2002, the company linked more local farmers with the colleges. Because of its considerable growth and success, the Agriculture Society sold Farm Fresh Connection to Martha as a for-profit business.

In 2013, the company did over **$1.0 million in sales** with 100 growers and two employees. They now have a barn with dry cold storage capacity. They **service 250 clients**, but **do not distribute beyond an hour's drive** from the warehouse:

- Sysco Northern New England
- Retailers: approximately 30
- Food service: 150
- Institutional: St. Joseph's and Bowdoin colleges; Portland school district
- Farmstands: 20. Since most farms grow only a certain array of foods, FFC distributes other local grown products to diversify each farmstand's offerings and broaden the market for producers. Farm Fresh also has a farmstand.

39 Interview with Martha Putnam. April 11 2014

- Occasionally, they ship to the Common Good Market and sometimes to Tuscarora Organic Growers in Pennsylvania, when those markets run out of roots and tubers and they are plentiful in Maine storage.

Martha's approach was to **start small and execute well. A fundamental key to success was her building relationships with growers and clients.** She sees steady business growth, but creating strong business and personal connections takes time and she does not want to outstrip production and distribution capacity. Her customers – direct; food service; retail; and restaurants – demand to know their sources. So if Farm Fresh Connection products arrive on a Sysco truck, her clients are aware of the source.

Because the company works with some clients that may not need a full case of vegetables, they use split-case options. However, because Farm Fresh is not licensed to re-pack produce, they buy split-cases directly from growers. The company supplies the split-case boxes to the farmer who pack the smaller sizes; since the boxes are not opened until they reach the end user everyone benefits from this simple procedure. For example:

- Green peppers: normal size is 22 pounds; split is 12 pounds
- Cucumbers and tomatoes (year around from Backyard Farms in Madison)

Farm Fresh Connection product line focuses on produce, fruit, and grains. They buy berries, apples, and pears and Aurora and Maine Grains flours. They also carry meats and some cheese:

- Luce's Meats. Generally sold from the company's stand at Wealden Farm.
- Maine's Sonnental Dairy and Hahn's End
- Vermont's Parish Hill Creamery; the cheese is aged at Crown Finish Caves in Brooklyn

Over the last decade, Martha sees farm businesses maturing and doing much better at packaging and sales. She said farmers must balance risk: greens are not profitable, whereas root vegetables are. Berries, herbs, and chive blossoms, while in demand, are risky. Other high demand products include:

- Honey – very strong demand
- Maple sugar, not syrup
- Mushrooms. We put her in touch with Mousan Valley Mushrooms (see Wild "Cultivated" section).

Her major concerns:

- How to create a steady consistent market for farmers and Farm Fresh Connection.
- Farm to school – where is the profit? After many years working with farmers and schools does not yet see how the current fiscal equation works for either.
- Maine has a strong food sovereignty movement that split many previous allies about farm and food system change. She fears public perception about food safety is clouded by unreasonable and sometimes ill-informed messages. Moreover, the new FSMA further contributes to public

distrust of the federal government, let alone how everyone involved in the food systems will manage the requirements.

Red Tomato. Plainfield MA[40]

In 1985, Michael Rozyne co-founded Equal Exchange and was the head buyer and marketing manager for Northeast Cooperatives in Brattleboro VT. In 1996, he took a sabbatical to explore how to apply the lessons and principles of the fair trade movement to support farmers in the northeastern U.S.

Established in 1996 as a way to connect farmers with consumers through good produce, Red Tomato ran a small warehouse and distribution facility, in addition to marketing, selling and helping to develop new products. Realizing a small conventional distribution model could not compete economically, the company focused on managing logistics through a network of farmers, independent truckers, and wholesale partners. In addition, it developed strong marketing, branding, and packaging to give farms and products greater consumers visibility.

Red Tomato now markets produce for a network of over 40 farms, and apple orchards (through its Eco Apple™ program). Over 200 retail stores in New England, New York, and the mid- Atlantic carry Red Tomato produce, as well as a few select markets outside the region. **Currently, it does not transport meats, but with the right New England farmers and sales outlets, they would consider sourcing**.

The authors believe the unique Red Tomato distribution model might offer opportunities to move Northern Tier products. The company's distribution operation is a coordinated network that makes efficient use of existing trucks, on-farm storage, and consolidated warehouses. This low overhead approach moves product quickly, and provides time to market and promote, manage supply, and develop relationships with retail and wholesale buyers.

Growers harvest, process, pack, and store what they grow, while Red Tomato coordinates the design and production of packaging, specifically for their farm and product. The company gathers product at consolidation points on centrally located farms, at the produce market in Chelsea MA, or at distribution centers. When orders from a single farm are too small to fill a truck, consolidation keeps costs down. Red Tomato delivers to a retail produce department either through direct store delivery or a distribution center. Red Tomato has a network of regional growers and third-party truckers. To move products from a farm to store or distribution center, it might ride on two or three different trucks in a 24 hour-period.[41]

Saveurs des Cantons

Saveurs des Cantons, a non-profit sister organization to **Créateurs de Saveurs** in the eastern townships of Quebec. Saveurs des Cantons, a distributor of local products, is organized as a web-driven ordering system. The

40 Interview with Michael Rozyne. February 4 2014. http://www.redtomato.org/

41 See appendix V for detailed description of Red Tomato

site has 30 producer members with over 700 products represented. Saveurs des Cantons also has an organized fundraiser program for schools and non-profits in which rather than selling chocolate bars, the institutions are using the local products as the items on offer.[42]

North Country Farmers Cooperative. Colebrook NH

A Coop of 30+ farmer members, the Coop aggregates and distributes product to restaurant and institutional accounts in Northern New Hampshire. Similar to Saveurs des Cantons, the Coop is set up as web-driven ordering system.

D&S Distributors. Hardwick VT

A private distribution company owned Don Maynard with many institutional and school accounts across northern Vermont and the Burlington corridor.

PT Farms. Haverhill NH

PT Farms' refrigerated truck travels the I-93 and I-91 corridors to restaurants in Boston. The company will drop ship other products to accounts on its distribution route.

Vermont Sail Freight Project. Ferrisburg VT

An interesting and "sustainable-model" driven approach, the Vermont Freight Sail Project is a carbon-neutral freight company connecting farms and forests along Lake Champlain with the Lower Hudson Valley. The boat carries non-perishable foods like syrup, beans, potatoes, pickles, salsa, applesauce, flax seed, pancake mix, honey, sea salt, mushrooms, sunflower oil, and chocolate bars to New York and returns with dry goods products from New York farmers to Vermont.

42 http://www.saveursdescantons.com/mission-services.aspx.html

PROTEINS

Increasing demand for local protein is driving regional production for an array of meats. However, the North Country's winters and hilly, rocky topography have traditionally meant limited capacity and higher operating costs restricting the region's ability to compete on a national scale. This remains the reality today. Data from surveys conducted in Vermont, New Hampshire and Maine show 82% of all livestock operations in the NCIC study region process fewer than ten head per quarter or 40 animals per year.[43] Even with producer and buyer support for increased production, the region is hindered by insufficient expertise, infrastructure, and the capacity necessary to produce livestock at a sustainable price point.

What Could Optimize Livestock as a Viable Industry in the NCIC Region?

Technical Assistance for:

- Forage intake, diet and nutrition plans for grain and grass based operations
- Land and pasture planning
- Infrastructure design, planning and budgeting
- Animal health and welfare
- Animal handling
- Production protocols to raise animals for specific marketing claims such as natural, animal welfare certified, certified organic, grass fed, etc.
- Business planning, enterprise and cash flow analysis, price point analysis and market research

To increase livestock production in the region, conventional and organic producers must improve product quality, yield, and consistency to interest buyers. Likewise, these buyers must support the producers by paying an economically viable price point; otherwise, farmers and growers cannot survive.

Historically Vermont, New Hampshire and Maine produced significant amounts of the animal protein consumed in northern New England. Some livestock, such as hogs and turkeys, were grown for meat, while other meats were a byproduct of dairy, fiber or laying hen farms. In addition to commonly consumed animal proteins such as beef, pork, lamb, poultry and eggs, the Northeast demonstrated potential to produce rabbits, meat goats, and farmed fish.

As transportation facilitated inter-regional trade, it became more economical to source protein from outside New England where it was cheaper to produce, resulting in a slow decline of the

43 "Keep Growing Survey," 2013; "More Maine Meat Survey," 2013.

region's production. In the last decade a resurgence occurred in New England protein production, fueled for several reasons:

1. **Climate**: the region receives ample rainfall, has abundant water resources, and grass grows really well here.

1. **Market demand and health concerns**: consumers are becoming more concerned about how their food choices impact their health, animal welfare and the environment. They are increasingly seeking meat known to be either locally grown, grass fed, or certified organic and shying away from meat from concentrated animal feed operations.

2. **Landbase**: livestock do not require prime agricultural soils to thrive. Producers can utilize regional land assets that other forms of farming cannot, such as fallow land and marginal hillsides.

3. **Lower financial and labor commitments**: unlike a vegetable farm or dairy, livestock operation can be a part-time endeavor with minimal daily maintenance. Livestock make a good choice for beginner farmers, hobbyists, and part-time enterprises for existing farms.

4. **Cash flow and shelf life**: finished meat products can be frozen and livestock production schedules can be aligned to yield regular finished product year round.

Given this interest, several studies were conducted in recent years including:

- 2005. *Pride of Vermont: Slaughterhouse Feasibility Report*
- 2006. The Vermont Housing and Conservation Board: *Vermont Ground Beef Marketing Study*
- 2011. The six New England Agencies of Agriculture jointly commissioned the *New England Beef-to-Institution Marketing Study*
- 2013. Vermont Livestock Care Standards Advisory Council prepared a report on the state of the pork industry in Vermont for the House Committee on Agriculture.

At present, an additional five studies are underway:

- *Keep Growing*, a project of the Ammonoosuc Conservation Trust to explore opportunities for increased access to local food in the North Country
- The *More Maine Meat* survey by University of Maine Extension to quantify demand for increased livestock production in Maine
- The *Meat Production, Processing and Market Demand in New Hampshire: A Comparative Analysis survey*, conducted by New Hampshire's Center for Rural Partnerships, to gauge the obstacles and opportunities to increasing meat production in New Hampshire as they relate to processing facilities and regulation of such facilities.

- *Market Analysis: Consumer Valuation of Meat Processing* to explore consumer perception of the livestock processing industry to identify strategies for producers and processors to increase market share by responding to current and future trends in purchasing behavior. Prepared for the Vermont Meat and Poultry Processors Association.

- UNH Extension research to grow bull calves to beef size with an all-corn diet.

Demand for local meat parallels the demand for local food in general; increasingly consumers seek local product and as the audience broadens so too do expectations for quality and convenience. What does this mean? **The authors argue consumers expect the same features and benefits integral to a "local" product that they would receive when shopping for "any" product**.

- **Access** must be convenient and accessible. It needs to be in areas they already shop, such as grocery and convenience stores.

- Local meat must **meet or exceed quality expectations** consumers assume from current grade A choice beef. Consumers want tender beef with wonderful mouth feel and great tasting, meaty flavor. Since Americans "eat" with their eyes, meat must be professionally presented with attractive cuts and packages. Standardized packaging also facilitates interest from commercial buyers, such as meat managers in retail settings, who consider features such as stack ability in the cooler. Retail and individual buyers appreciate the added benefits of a "being local" commitment, but they want it in "addition to" the features and benefits to which they are accustomed.

- To fulfill these expectations, **every step in production** becomes **essential** to produce **top-notch meat**. From careful genetic selection to pasture management to transportation to slaughter and meat-cutting, each contributes to quality. **A farmer makes a huge investment to raise a steer on grass over 18 - 24 months; inappropriate slaughter practices, imprecise butchering, and unattractive packaging can easily compromise this investment in a few seconds or minutes**. The Hannaford Career Center in Middlebury VT offers a federal-approved apprentice program for meat-cutting; every recent graduate secured employment. In collaboration with Vermont Technical College, Hannaford offered a meat-cutting course during summer 2014.

  In addition, over the last eighteen months, in all three states, new slaughterhouses were built to manage the growing population of meat animals. More slaughter facilities follow humane practices to respect the animal and produce a better quality carcass.

- We must recognize the **importance of consumer education about the costs to produce livestock** in our region. Without education, price surfaces fort consumers as a key decision making factor that in turn, pressures the local livestock industry into an increasingly **margins vs. features based business**. If we take the time to educate consumers about the **real cost of meat production** and what it means – the benefits to their health, landscape, local economy, and so

forth – we can potentially avoid some of the price pressure that normally comes into an industry as it becomes commoditized.

- **Room for growth exists for "local" protein in all markets from niche production such as certified organic, 100% grass fed and non-GMO to conventional production**. The best sales channel for expansion is penetration into local and regional mass market retail stores such as Whites Markets (northern VT), Market Basket (NH), Hannaford's (New England), Shaw's (New England), Price Chopper (New England), Whole Foods (national with a focus on farm fresh and local), and Trader Joes (national with a focus on specialty and local) to name those most prevalent in the local and regional markets. **The caveat for long term success is ability to produce at a commercial scale and wholesale price point that is profitable while revising the general perception of local as expensive and out of reach, such that more consumers see it as accessible and aimed at them. It is not that most consumers don't want local so much as their perception that they can't have it.**

- Ideally, through having multiple strategies available and through assisting each farm incorporate those which best suit their farm, land base, and infrastructure, the North Country can support **long term, successful, profitable agricultural enterprises produce** at a size and scale **environmentally sound** for their land base and infrastructure**.**

Seeking to capitalize on the growing demand for local, a new cadre of local meat businesses, many of which aggregate animals from different farms, are entering the market. Pioneering brands such as Maine Family Farms; Pineland Farms; Dole & Bailey; and Hardwick Beef are now joined by Black River Meats (an offshoot of BR Produce); Spring Hill Angus; and PT Farms as aggregators and distributors of local meat; in addition to many individual farms selling direct. **Local brands are not only competing amongst each other but also against niche, premium brands such as Applegate Farms, Niman Ranch, and Organic Prairie, who emphasize similar values, features and benefits such as certified humane and/or organic, grass-fed, sustainable, and family farmed.**

While the fastest growing market opportunity is placement in retail stores, **opportunities to expand direct market sales** do exist across the region. There continues to be a growing number of individuals seeking a direct relationship with a farm or grower. The effort required to find and retain these customers, however, place greater emphasis on the **individual farmer to be an expert producer AND expert sales and marketer**. The **product** and **customer service** must meet or exceed what can be obtained via mainstream channels. Buyers in these situations go out of their way to participate so the grower must convincingly communicate the customer value received from the relationship to attract a customer base and then must be able to follow through on expectations in order to retain that customer base. One reason buyers will continue to seek out direct relationships with farms is transparency and an ability to ensure authenticity, especially as demand for local food gains mainstream traction. This is in part as a reaction to what happened with the organic movement when many felt so much of the value of "certified organic" was bastardized once large corporations tried to cash in on consumer demand.

"....**organic labels no longer carry the same value as they did ten years ago**. For both consumers and producers, the federal standards diluted and undermined the distinction between organic and conventional farms. With Walmart the nation's largest purveyor of organic foods, many consumers want locally-sourced foods not organic as defined by a big box store. **One retailer said: 'neither designation** (grass-fed or organic) **is important – the issue is quality. An organic designation does not elevate a bad product to good!'"**[44]

Examples of Northern Tier farms, excelling in a direct to consumer model, include Snug Valley and Tangletown farms in Vermont; Otokahe Farm in New Hampshire; and Middle Intervale and Sumner Valley farms in Maine.

As mentioned New England has limited capacity to supply the larger regional demand for local product. As a result, several businesses that want to offer "local" meats, developed a strategy in which they source animals from outside the region to finish locally or are used in local value added products. These items then carry a label that implies or even says "local sources." As highlighted above for some buyers, producers, and most importantly, consumers, the practice is controversial. They question the authenticity of a "local" claim for animals that spend most or all of their lives elsewhere. The question then becomes, what features and benefits does a company claim and who is the target market? Will it dilute the weight that the marketing message "local" currently carries?

For some businesses the **goal is 100% grass fed or certified organic** and therefore, "local" is a secondary benefit. Their target are consumers concerned with the **way the meat was raised**. For these consumers, a local claim may not be so important. For others, the key element may be that the animal is **100% local**. For this claim, companies may find their target group are consumers concerned with **transparency** and **trust** in their food supply chain. Companies providing clear and honest information about their products, will attract positive visibility and increase sales. As demand for local grows, **producers must understand their target consumer and what drives their decision-making to insure their business practices and marketing messages speak to their audience.**

Most businesses that buy animals from outside the region expressed a desire to source a greater percentage of their animals from New England, if product was available at acceptable price points and quality levels. The bottleneck usually comes down to price. What a business can pay is often insufficient compared to cost of production; even with the best of intentions, the reality of a 100% local supply chain that feeds a greater regional market for fresh meat and value added production may be financially unrealistic. The report details opportunities

44 Jeffrey Roberts. "Catskill Mountains Cheese Project Market Study." 2013

for producers interested in working with aggregators or specific sales channels so producers can evaluate the opportunities for themselves.

In an effort to maximize sales of local meat, the most effective strategies to **increase market share** for local product will be to **promote the farmer**, who raises the meat, to create "**a face on the food**." People connect with people, they develop an emotional and psychological reassurance about the product by seeing and feeling a connection to the people who produce it. **Focus the marketing message and visuals on the people producing the meat, not the meat itself.**[45] Although seemingly inconsistent with the earlier arguments about quality and consistency, the recommendation emphasizes the value of identity and connection to farms and farmers as a key marketing tool.

Equally important, producers and retailers must make fresh (unfrozen) local product available. In many instances, retailers receive frozen product that they thaw for presentation and sale to consumers. The same technique needs to be extended to local product. Most farmers receive their product frozen from the processor and sell it frozen; likewise, retailers also resell it frozen. However, most consumers when shopping for meat, restrict their purchases to the fresh meat counter. Many opportunities for expansion of local product to a wider customer base are lost simply because of placement and method of sale. Having previously frozen, thawed local products in the fresh meat case would immediately increase sales and visibility for local meat. When buying meat consumers, thinking of their next upcoming meal, ask themselves "what is available that is ready to cook, what looks good, what do I have the time and knowledge to cook, and what is the best value?" **Whether in a supermarket or at a farmers market, producers will sell more meat, if some of it is available for sale fresh not frozen, and if they provide tips on how to use/cook those cuts**.[46]

Challenges and Opportunities

According to the Vermont Climate Assessment conducted by UVM in 2014, as the region's climate becomes wetter, growing grain in New England will become increasingly difficult. While potentially undermining the opportunity to grow grain and thus grain fed animals, **greater rainfall supports the ability to grow grass-fed livestock**. Over time New England may become naturally populated by grass fed animal farms simply because the region's farms adjust to new environmental conditions. If this scenario occurs, it would strengthen the region's ability to command a consumer response to a **place based brand**. The suitability of land and climate to grass-based operations creates the right conditions to raise superior meat; likewise, the region can emphasize the concept of terroir for the region. An example of a successful, large scale 100% grass fed operation is North Hollow Farm in Rochester VT. The farm has a 400-500 head beef herd from which it processes 3 to 5 head per week and **ship product to Vermont and national outlets**.

45 Wilson, R. *Market Analysis: Consumer Valuation of Meat Processing. 2014, VAAFM/VMPA*

46 Wilson, R. *Market Analysis: Consumer Valuation of Meat Processing. 2014, VAAFM/VMPA*

Local livestock production faces a set of important questions. If we capitalize on the demand for local, does it push the boundaries of profitable, sustainable production capacity? If so, what defines local? Are feeder stock brought in from elsewhere truly local? Consumers want local, but are they willing and able to pay for the cost of production? How much regional demand exists for local meat and how many producers would fulfill this demand? If producers need to focus on regional markets and margin driven production models, how can we create a food system in which more of the region's producers can meet lower price points or more consumers and buyers understand, accept and support the higher cost of local production?

Changes in the global food supply increasingly impact and inflate the cost of **commodity livestock** production. Over the past several years, droughts, floods, and epidemics created shortages and rising prices for commodity meat. Chinese meat consumption continues to add upward pressure on prices. Equally important to Americans, meat contamination forced product recalls and eroded consumer confidence. Therefore**, do rising commodity prices and wary consumers create an advantage for local meat?** Is it possible the gap between commodity prices and more expensive local meat may shrink? **In the authors' opinion, we can develop new strategies to emphasize quality grass-fed animals, humane growing and slaughter practices, safe food, and local farmers to shift consumer behavior towards the purchase of New England offerings to the point where the price for local makes sense to more consumers**.

Based on surveys completed in the study region,[47] 67% of livestock producers want to expand. To do so, however, the producers need to address the following challenges:

Access to capital	42%
Processor availability	36%
Feed costs	32%
Local Demand/Demographics of region	32%
Labor	24%
Handling facilities	23%
Lack of assistance	19%
Marketing	18%
Farmer Health and Age	16%
Supply	14%

According to the Vermont Livestock Care Standards Advisory Council, the state's pork industry is limited by inadequate infrastructure to support expanded production, including nutritional consultation, equipment availability, expertise in biosecurity and animal health, and feed diversity.[48] Maine and New Hampshire

47 "Keep Growing" 2013; "More Maine Meat" 2013.

48 "Swine Gestation Crates Position Statement." VT Livestock Care Standards Advisory Council. January 2013.

producers face similar concerns of inadequate access to technical assistance for livestock production. Eighty four percent of *More Maine Meat* respondents want to learn how to "live grade" animals to predict yield. The *Keep Growing* producers expressed need for technical assistance related to infrastructure design, feeding regimens, breeding and genetics, livestock handling, pasture & natural resource management, business planning, enterprise analysis and marketing. For regional buyers, a key concern is whether New England's farmers can produce consistently high quality meat at price points and volumes that support both parties.

One additional concern across the study region is a **shortage of large animal veterinarians**. Beyond any federal or state regulations, the Northern Tier must have veterinarians and food safety experts to provide medical, scientific, and technical support at every level. For any animal-based food products, these specialists are invaluable.[49]

Pricing

While commodity product faces regular and volatile price fluctuations, local meat pricing for the most part is fairly stable, in part because of the direct nature of the buyer-seller relationships. The producers did the math and know what price they need to charge to remain profitable. Buyers know they can plan on a stable price point for their budgeting and analyzed the numbers to ensure the prices work for them. The two develop trust and respect and a symbiotic, sustainable, long-term relationship evolves. The price equation does not require alteration unless cost of production goes up to a point where the producer needs to charge more, and even when this happens, the frequency with which it does so is minor in comparison to the rate at which commodity pricing fluctuates.

Alternative proteins (goat, mutton, lamb, aquaculture, rabbits, etc.) can be a direction for farms who can cultivate a direct to consumer market. In general, if the farm is to remain profitable, price points and yields for these products place them fairly out of reach of commercial buyers (retailer, restaurant, and wholesale markets).

Slaughter & Processing Plant Capacity

Because animal slaughter and meat processing are low margin activities, they require significant production volume to break even and provide for family living expenses over and above operating expenses. As fewer families raised their own animals for meat and more food was purchased from grocery stores, the need for slaughter, processing and meat storage in the northeast diminished. Changes to regulatory oversight of slaughter and meat processing in the mid-1990s required increased record keeping for small business owners and further reduced the number of slaughter houses operating in the region.

49 Interviews with Gail McWilliams Jellie. April 2 2014 and Bonnie Rukin. October 14 2013.

Many small grocery stores that historically hung carcasses for aging and processed meat for local families stopped providing these services.

Farmers need to be able to slaughter their animals in a timely manner, with the appropriate regulatory oversight, to fulfill their desired method of marketing to consumers. Vermont and Maine maintain state regulated meat inspection programs through state departments of agriculture. However, animals slaughtered and processed through state controlled programs may only be sold within state lines. Vermont, Maine and New Hampshire have access to federal meat inspectors through the Animal Plant and Health Inspection Service (APHIS) administered by the United States Department of Agriculture (USDA) and each state.

Through their state regulated meat inspection programs, Vermont and Maine provide a portal for development of slaughterhouses and meat processing businesses. Although the standards of inspection as essentially identical for state and federal programs, the state inspection services are able to provide a degree of technical assistance to small and startup businesses not readily available through federally administered programs.

Compared to other New England states, Vermont and Maine have maintained a fairly diverse system of state-inspected facilities and other slaughter options for meat producers, such as itinerant slaughterers (on-farm slaughter for home consumption), custom slaughterhouses (for home consumption), and commercial slaughter plants (for meat sold commercially). As livestock production began a resurgence, processing capacity was recognized as a serious barrier and several entrepreneurs stepped in to fill the void. A state-of-the-art 18,000-square-foot USDA-inspected plant opened in Westminster VT; NEK Processing recently opened a 15,000 square foot facility in Lyndonville VT complete with a smokehouse for use by its own farm (Spring Hill Angus) and by others. Since 2010, a number of VT state-inspected processing and fabrication facilities opened and some existing plants expanded their operations, thereby further reducing the bottleneck for timely access to slaughter. Several new poultry and mobile poultry processors will open, including two USDA-certified facilities in Barre and Randolph VT and a custom mobile operator from Randolph VT.

In New Hampshire, meat capacity and demand is slowly changing, although four slaughter houses are now in operation: Goffstown; Barnstead; PT Farms built a USDA-inspected facility in Haverhill; and Darrell Robinson opened a USDA-inspected facility in East Conway. According to Gail McWilliams Jellie, Director, Division of Agriculture Development, NH DAMF, the state could use another facility beyond North Haverill.[50]

The issue that remains for northern producers is distance to any particular slaughterhouse (most meat-producing states have similar transportation challenges). Trucking is an important economic factor to assess when evaluating the feasibility of an operation. A producer ten miles north of Groveton NH, for example, expressed concern although he can make the trip to North Haverhill NH (a distance of 65 miles, approximately an hour and half), the transportation expense makes his product cost prohibitive.

50 Interview with Gail McWilliams Jellie. April 2 2014

Research and Development

Tom Bivins, former co-owner of Crop Bistro in Stowe, VT argues strongly that producers should engage the region's chefs in their product development and marketing. For some types of dry-cured meats, for example, chefs are the best first step for a producer looking to sell new items. As the former executive chef at New England Culinary Institute and former chair of the Vermont Fresh Network, he thinks the story behind the products – what breeds; best farming and processing practices; what they eat; pastured; humane grown and slaughtered can help tell a compelling story. In addition, chefs and restaurants are an important source for feedback to producers about product quality and consistency. With markets growing more competitive, such constructive criticism is essential to future success.[51]

51 Jeffrey Roberts. "**Vermont Dry-cured Meat Marketing Study**." VT Farm Viability Program. 2012

PROTEIN SPECIES BY SPECIES

Pork

From 2000 to 2014, per capita consumption of pork in the US ranged between 46 and 51 pounds (in 1971, pork consumption peaked at 71 pounds per capita).[52] Recent trends in consumption of bacon and various valued added *charcuterie* products multiplied demand for pork raised from heritage breeds using specific production methods. Increased interest to use forages for pork production will help develop the competitiveness of meat raised in the Northeast.

Over the past six to eight months, Porcine Epidemic Diarrhea Virus (PEDv) changed prices significantly across North America. This disease "is not a new virus, nor is it a regulatory, reportable disease. Since PEDV is widespread in many countries, it is not a trade-restricting disease, but rather a production-related disease (National Pork Board)." [53]A shrinking supply translates into higher prices and until producers and health authorities control the spread of PEDv (during the last week of March 2014, the first Vermont cases were reported), these shortages will continue.

"... the economic burden of this disease is falling on the consumer not on the producer.... producers are losing animals from the disease, but they are able to make up for the losses because of the increase in meat prices. Consumers will pay the price for PEDv."[54]

Rabobank Report: PEDv Will Cause Significant 2-Year Shortfall in North American Hog Market of approximately 12.5% below 2013 Levels.

Writing for *Meat & Poultry*, Steve Kay describes the following:

> *PEDv was first confirmed in the US on May 16, 2013, in a herd in Ohio. It has since spread to 30 states and into Canada and Mexico. That slaughter-hog prices consequently set new record highs is little consolation to individual producers. Some have seen their pig herds decline as much as 50 percent. Just over half the US breeding herd has been affected, analysts say. The pigs that have died had a combined value of $280 million just to produce, says industry economist Steve Meyer, president of Paragon Economics. At finishing, they might have been worth a combined $1.26 billion, he says. "The pigs would have cost about $40 each to produce - that is at the time that they died," says Meyer. "Had they not died, they would have been worth anywhere from $160 to about $200 each at finishing. None*

52 USDA statistics

53 **www.pork.org**/News/3904

54 Kimberlie Clyma. "**PEDv continues to impact meat industry."** *MeatPoultry.Com*. June 3 2014

would have been worth the $250 or so that the remaining pigs will bring this summer. Profits on those pigs would have run from zero last fall to about $50 per head this summer," he says.

The cumulative impact of the deaths means that fewer market hogs have been available to pork processors from early in the year. Several plants by early April, notably Smithfield Foods' huge Tar Heel, NC, plant, were running reduced hours. As of the week ended April 26, year-to-date commercial hog slaughter was down 4.3 percent on the same period a year ago. Pork production during the period was down only slightly because of record-heavy hog carcass weights. Yet, the full impact of PEDv deaths is still to show up, say analysts. The decline in the number of market-ready hogs likely will not peak until July or August.

Consumers began feeling the PEDv pinch in March. The weekly fresh pork wholesale cutout, as reported by USDA, began the year at $83.70 per cwt, up only 1.4 percent from the year before. It broached $100 the last week of February and hit a record high of $131.97 the week ended April 5. It had declined to $117.35 the week ended April 26, but the damage was done. Retail pork prices, as also reported by USDA, averaged $3.76/lb. in January and $3.95 in April, up 5.2 percent. They were expected to be higher again in the June report.[55]

According to **Index Mundi**, **US commodity pork prices increased 31.12%** from September 2013 to April 2014 and then experienced an 8% drop. See chart below:

Table 1. US commodity pork prices

Month	Price	Change
Sep 2013	91.73	
Oct 2013	87.76	-4.33 %
Nov 2013	81.50	-7.13 %
Dec 2013	78.57	-3.60 %
Jan 2014	78.85	0.36 %
Feb 2014	86.35	9.51 %
Mar 2014	113.21	31.11 %
Apr 2014	120.33	6.29 %
May 2014	110.47	-8.19 %

55 Steve Kay. "**Vexing Virus**." Meat&Poultry. June 2014

According to Pig333.com, a Website tracking Canadian commodities, Quebec pork prices reflected similar volatility as the United States.[56]

Table 2. 2013 -2014 Quebec pork prices (Canadian dollars per 100 kilograms)

Weekly price CN$	Percent change	Weekly price CN$	Percent change
31-May-2014: 222.69	-0.018	08-Mar-2014: 200.05	+0.127
24-May-2014: 224.48	-0.032	01-Mar-2014: 187.38	+0.117
17-May-2014: 227.71	-0.025	22-Feb-2014: 175.67	+0.040
10-May-2014: 230.21	-0.060	15-Feb-2014: 171.68	+0.030
03-May-2014: 236.22	-0.054	08-Feb-2014: 168.70	+0.027
26-Apr-2014: 241.65	-0.111	01-Feb-2014: 165.98	+0.047
19-Apr-2014: 252.77	-0.088	25-Jan-2014: 161.26	-0.003
12-Apr-2014: 261.58	-0.023	18-Jan-2014: 161.51	+.064
05-Apr-2014: 263.84	+0.093	4-Jan-2014: 152.00	
29-Mar-2014: 254.49	+0.234	28-Sep-2013: 184.99	
22-Mar-2014: 231.08	+0.166		
15-Mar-2014: 214.52	+0.145		

56 From pig333.com. June 3, 2014. For up-to-date prices, go to **www.pig333.com**

From January to May 31, 2014, these numbers translate to a dollar value of $0.69 to $1.20/lb. hot hanging weight for commodity Quebec pork, New England's largest commodity pork supplier. Quebec pork producers supply Vermont Smoke and Cure and New Hampshire's North Country Smokehouse and Poultry Products Northeast to name a few. Meanwhile, during this same time frame, December 2013 and April 2014, direct local pork to consumer sales averaged $7.94/lb. for finished, packaged mixed retail cuts and $4.28/lb. for hogs sold to consumer by hot hanging weight as a whole, half, or quarter. The average price for local pork sold hot hanging weight wholesale to a distributor was $2.13/lb. Direct from producer to retail or restaurant, accounts were paying an average of $2.44/lb. for whole or halves hot hanging weight and $5.67/lb. for finished packaged cuts. Pricing data from interviews is found in the chart below:

Table 3. Local Pricing, December 2013 – April 2014

Local Pricing December 2013-April 2014				
Pork		Max	Min	Average
Direct to Consumer	Mixed Cuts	$ 12.00	$ 5.13	$ 7.94
Direct to Retailer	Mixed Cuts	$ 9.00	$ 3.50	$ 5.67
Direct to Consumer	Hot, Hanging Weight	$ 5.50	$ 3.40	$ 4.28
Direct to Retailer	Hot, Hanging Weight	$ 2.80	$ 2.05	$ 2.44
Wholesale	Hot, Hanging Weight	$ 2.40	$ 1.86	$ 2.13

In terms of what local producers are up against, one Vermont restaurateur commented: "Pork coming from Maine and Quebec is often quite a bit cheaper even for seemingly similarly raised [Vermont] animals."

Steps to Increase Production

Consumer demand for locally raised pork products remains steady or is growing slightly. Limiting factors to expanded production are grain prices, cost of slaughter and in some areas, access to slaughter. Profitable pork production requires sales of all available meat at the highest possible price. To dry-age hams from heritage breeds of hogs increases the sales value to more than $17/lb. but requires specialized training and facilities. Pork in particular, has significant value added potential, see the following.

Beyond Fresh Prime Cuts: Pork in Many Forms

Beginning in the 1970s, America's relationship to pork changed dramatically. In part mandated by Congress about a fear of too much fat in our diets and the rapid expansion of chicken as a healthier option, hog producers, breeders, and industry advocates like the National Pork Producers Council and National Pork Board worked to create a leaner animal. In 1987, a marketing campaign – "Pork. The other white meat" – debuted; pork was now "equal" to chicken

with lots of data and comparisons about calories and cholesterol. To say the least, the campaign was one of the most successful in American history; although chicken consumption increased, per capita pork consumption did not lose ground. The consequence of steady demand for leaner animals and a growing population translated to hog production on an industrial scale. Similar seismic shifts in practices occurred with beef, chicken, and turkey.

In addition, the advent of leaner hogs for the mass market pushed heritage and older breeds almost to extinction. Fortunately, enough farmers and consumers kept these animals from disappearing and in the last 20 years, as tastes again evolved, slowly these hogs are returning.

For example, a shift in consumer consciousness about fat spurred an explosion of "artisan bacon." Although great bacon was always available, media attention beginning the late 1990s, created a loud buzz in the food world.[57] Since then, bacon in recognizable forms (BLT sandwich or bacon and eggs) to the unique (bacon ice cream or bacon flavored bourbon!) captured consumer, chef, and producer interest. Despite rising prices, demand for quality bacon is at an all-time high; industry analysts predict even with higher hog prices, demand for bacon may increase further, since it offers a less expensive alternative to buying other cuts of pork.

But America's obsession with great-tasting pork products extends beyond bacon. Over the last decade, cross-breeding not only added more fat to leaner types but increased availability of better quality carcasses for both artisan and larger-scale processing. In New England, companies like Vermont Smoke and Cure (VT), North Country Smokehouse (NH), Smith's Smokehouse (ME), Fortuna Sausage (RI and VT), and Daniele Foods (RI) utilize hogs from the region and Pennsylvania and Quebec for fresh, cooked, smoked, and cured items.

The market for sausage continues to grow and since they use trim rather than whole muscle, producers, buying from regional slaughterhouses, make higher value items. The food safety regulations to produce these sausages are less onerous and expensive to institute and maintain. Some small operations begin with fresh and/or frozen sausages because they can generate cash flow quickly; and later, if they chose, can then branch into other specialty pork products that require more time and money.

Some farms, raising beef, pork, lamb, or goat, take back the animal trim from slaughterhouses and produce a variety of sausages, including various mixed meat types. A few examples are: veal and pork bratwursts; merguez from goat or sheep; or knockwurst with beef and pork.

57 R.W. Apple, Jr. "**The Smoky Trail To a Great Bacon**." The New York Times. February 16 2000

Dry Cured Meats

A 2012 study, analyzing the potential for dry-cured meats, revealed strong optimism for the future for these value-added foods.[58] Considering most 19th and 20th century immigrants to the United States came from countries with long histories of preserving meat, many traditional dry-cured sausages, salami, hams, and other styles had long since disappeared in post – World War II America, replaced by high-volume industrial products.

Dry-cured meat, mostly pork, is an important and growing culinary trend that follows in the footsteps of wine, craft beer, artisanal cheese, coffee, and tea. As travel became more affordable and efficient and as Americans' disposable income grew, so too has our exposure to other cultures and a desire to replicate these experiences back home. Dry-cured meats is one of the more recent trends and can be considered in tandem with artisanal cheese with which it is often paired. Americans first focused on perfecting the art of cheesemaking and now they are exploring the art of dry-cured meats.

"From national companies to owners of small curing operations to wholesalers and retailers of all sizes, owners expressed enthusiasm about a renaissance of American artisan dry-cured meat products. For instance, over the past five years at Di Bruno Brothers in Philadelphia, the market shifted from an emphasis on imports to local domestic products. Today, of their deli meat sales, 75% is dry-cured meat and this number divides into 60% import; 40% domestic. According to Emilio Mignucci, this represents an important change for his business.

"And yet, markets are not the same everywhere. Cities like Boston, New York or Philadelphia have such a large client base that even very high-priced items sell. In smaller markets, price may impact sales, even in those places where wealthy residents live. For example in Great Barrington, the owner of Rubiner's Cheesemongers and Grocers sees a maximum of $80 – $90/lb. retail for any dry-cured meat in his market, even though the Berkshires are a fashionable, more expensive region. Potential New England producers must make critical decisions about their markets, since higher-priced items have a narrower field in which to attract consumers."[59]

While dry-curing is an art form, making great, safe products requires scientific knowledge, specific skills and talent on behalf of the processor. These skills are traditionally passed down from generation to generation in Europe. In America, the ability to replicate European products has been challenging for two reasons, the first being access to training to acquire the skills normally passed down within families, and the second being food safety regulations that prohibit manufacturing and curing processes permitted in Europe. According to processors, it is nearly impossible to replicate old world products simply because of USDA regulations, according to Jeremy Stanton, owner of the Meat Market in Great Barrington MA. "In the US we are so interested in sanitation and sterilization, if you implemented US standards to making salami, you make a very generic product."[60]

58 Jeffrey Roberts. "Vermont Dry-cured Meat Marketing Study." VT Farm Viability Program. 2012

59 Jeffrey Roberts. "Vermont Dry-cured Meat Marketing Study."

60 Conversation with Jeremy Stanton, owner The Meat Market, January 1, 2014.

The American wine and artisan cheese communities are successful in large part because the industries invested resources into cultivating the scientific knowledge and providing the technical assistance producers needed to be successful in the US. Universities such as Cornell, Vermont, Washington State, and Wisconsin made access to technical assistance a priority. Because regulatory concerns continue to be an issue, a regional focus to develop the scientific knowledge, technical skills, and expertise to support producers would contribute to increased success of a New England and national dry cured meats industry.

For traditional dry-cured meats, salt is the essential "curing" ingredient; to make salami, a producer adds salt directly to ground meat, often with other spices and ingredients, prior to stuffing the mixture into a casing. For whole sections or muscles, the salt and perhaps spices or herbs are rubbed into the surface or are placed for a short time in a brine solution; the salt will migrate slowly into the muscles. Appropriate amounts of salt (and sometimes sodium nitrite or celery salt [it contain sodium nitrate]) and water with the correct pH level controls fermentation of the meat and mitigates growth of potentially dangerous pathogens (e.g. *C. botulinum*) during the aging process. All of these preparations – such as cased salami, hams, or single muscles like coppa – are aged in climate-controlled facilities (historically caves, cellars, attics or even chimneys) in which as they ferment and dry, slowly develop concentrated flavors, texture, and remain safe to eat. [61]A curing facility, similar to a cheese cave, nurtures a vast community of bacteria, molds, yeasts, and other micro-flora whose presence transforms each style into delicious, unique foods.

Market pricing and volume[62]

"As the Internet created virtual global media outlets, visibility, and marketplaces for craft beer and artisan cheese, likewise contemporary cured meat devotees can locate traditional and new up-and-coming bacon and salami makers through computers and smartphones. After an article in *Saveur* magazine about Benton's Smoky Mountain Country Hams in Tennessee, the company was so swamped with calls and Internet messages, it sometimes took months to fulfill orders just for bacon! **For many businesses, like Boccalone in Oakland and San Francisco, the Internet is the fundamental sales outlet; this company sells 90% of its high-end, expensive products through Internet and mail order sales**.

The data from producer and retail Internet sites shows retail prices range from approximately $7 - $9/lb. for low-end items to $140 or more/lb. for Spanish Iberico di Bellotta ham. Most retailers said they want to double the money they spend to buy a cured product. However, as you move up the price scale, margins tend to fluctuate to meet customer expectations. For example, one East Coast retailer buys Iberico for $72 and sells for $120/lb. As the previously mentioned Rubiner's example highlights, even in "high rent" areas, products must be priced to match market realities.

In major metropolitan areas, retailers must also satisfy high, middle, and low-end segments. At least one company has private label dry-cured products, some costing $16/pound wholesale to fulfill the lower end of the

61 **www.woolypigs.com/_aircuring**

62 Jeffrey Roberts. "Vermont Dry-cured Meat Marketing Study."

market. Several retailers commented their best selling items are Italian prosciutto, Spanish Iberico hams, and American prosciutto (e.g., La Quercia and Surryano); in some stores they account for 50% of the cured meat sold over the course of a year. During the Thanksgiving, Christmas, New Year's holidays, one store moves 50 – 60 prosciuttos a week!

The data suggests although wholesalers and retailers still rely on imports, the emergence of American dry-cured meats is shifting the balance. Overall, companies generally reflect a 50 – 50 split between domestic and imports. While Di Bruno Brothers and Murray's Cheese in New York reflect this division, they see the growth in domestic sales reducing the percentage of imports. Di Bruno is purchasing Pennsylvania products – bacon; ham; prosciutto; coppa; lonza; and capicolla – from Lancaster County farms. They see several new companies coming on-line, often with locally-sourced hogs.

Rubiner Cheesemongers in Great Barrington MA handles a wide variety of meats with a 75 – 25 domestic to import ratio that may reflect the store's well-established emphasis on sourcing local products. At Farmstead in Providence RI, they buy 50% import and 25% domestic. The reminder came from in-house; once the company's new facility is constructed and approved, the in-house percentage will increase dramatically. This may be a trend in the future for local businesses in smaller urban areas and rural communities.

The volume of dry-cured meat sold varies greatly and depends upon the outlet – most retail stores sell far more than restaurants. Beyond the type of business, a store or restaurant's location and the number of potential consumers impacts directly on sales. In 2011, both of the study's two metropolitan area businesses sold 50 – 100,000 pounds of cured meat; on average they move at least a **thousand pounds of dry-cured meat a week**! In addition, overall sales of cured meat products for these companies ranged from $1 million - $2 million. On the other side of the aisle, we have small retailers and restaurants whose modest sales range from **fifteen to thirty pounds a month** of cured products.

To answer the question about future potential volume, the study clearly identified, if great dry-cured meat is available distributors, restaurants, and retailers will buy it. "To increase sales of Vermont products, they plan to move incrementally, because of a need to educate consumers and patrons. Only two individuals gave estimates of the amount of product they might buy. One metropolitan company might buy upwards of seven hundred pounds a week, while a local Vermont restaurant would double its purchases to sixty pounds a month. Another company said they could use a middle price range product line for Vermont and New England."[63]

Challenges

Access to and the cost of hogs may be limiting factors for cured meat processors. As described earlier, high prices for hogs impact both fresh and value-added cured meat. In New England, limited production means processors of all sizes may need to locate hogs elsewhere. In addition, the 2012 study identified issues about the move from fresh to cured meat. One, why bother with dry-cured meat when fresh sausage is easier to make with less regulation and

63 Jeffrey Roberts. "Vermont Dry-cured Meat Marketing Study."

capital investment and faster cash flow? Two, HACCP plans and facilities are expensive and we are just beginning to education state and federal inspectors. Nearly every interviewee in the 2012 project said we must educate inspectors to help certify facilities and products. Furthermore, producers need technical support with HACCP plans and facility design.

The Quebec growers have two-to-three generations of production history and experience; in contrast Vermont farmers have just the current generation. In addition to farm size limitations and therefore production capacity, the region has a long way to go to improve animal genetics and animal feeds. For the best cured products, processors want animals with flavor, texture, fat, and other characteristics.[64]

In the authors' opinion, **NCIC can contribute to state and regional discussion** about these issues. The agency might help **connect potential cured meat entrepreneurs to available funding and funders,** while lobbying for **critical scientific and technical support.** Although some of these challenges seem daunting, over the past twelve to eighteen months, several encouraging trends suggest regional producers can fulfill opportunities for cured meat:

In 2013, **Daniele Foods** in Rhode Island, a large commercial producer, created a limited edition "Local New England" line of cured meats, including Del Duca Vlado's Riserva prosciutto (2014 Good Foods Award) and salami. They source hogs from several farms in Southern New England and want to expand production as more local hogs become available. Building upon Daniele's history and experience as a large-scale manufacturer, the strategy taps into demand for excellent, small-scale, locally-sourced, and produced products.

In addition, the company collaborates with **Black River Meats** to produce a Vermont line of cured meat. Black River Meats buys hogs from several Vermont farms for fresh cuts, while Daniele Foods transforms the trim into a variety of cured salami. This partnership offers a different strategy in which Black River Meats does not need to invest in a new facility or expertise, but creates a new value-added revenue stream for both companies.

Two Vermont companies – Guild Fine Meats and Vermont Salumi – are at different start-up stages for cured meat production.

Guild Fine Meats, part of the Farmhouse Group of restaurants, is located in Burlington. Guild sources whole hogs exclusively from Vermont Heritage Grazer Farm in Bridport and breaks down each carcass into a variety of fresh cuts to supply the company's restaurants and retail store. It uses the remaining trim to make its sausages and salumi. Guild constructed a USDA approved 5,000 SF facility, including a curing space, in Winooski to process all of its animals. Rather than aiming for USDA approval, the company decided to limit its permits and therefore, sales to Vermont, since they could work directly with state regulators.

Vermont Salumi in Plainfield started with whole carcasses purchased from local or Quebec farms. Initially, while most of the animal was butchered into quality cuts for local restaurants and retailers, production focused on

64 Interview with Pete Colman, **Vermont Salumi**. January 14 2014

fresh sausage and bacon. However, even buying an entire animal, they discovered wholesale prices for fresh cuts at best broke even, while the fresh sausage from trim made money. With a vision to create cured meat products, VT Salumi partnered with the Mad River Food Hub in Waitsfield; in 2012, the food hub constructed a curing facility (approximately $100,000 for equipment) with VT Salumi as its lead tenant. At approximately the same time, the company stopped buying whole hogs and now gets trim from Dole and Bailey to make fresh sausage and run its cured meat trials.

The process to develop recipes and procedures, including HACCP plans, took much longer than either partner expected. From balky air handling systems to unclear directions from federal regulators to unsuccessful trials and considerable expense (approximately $150,000 in employee time), the research and development took months. One outcome was a decision to forego federal approval and seek state authorization instead. Vermont Salumi aims to make a successful cured product, generate cash flow beyond fresh sausage, and gain valuable experience, skills, and knowledge. In July 2014, the company received its final state approvals. Ultimately, Mad River Food Hub has the capacity to manage 4,500 – 5,000 pounds of cured meats.

Late in 2013, **New England Charcuterie** opened in Waltham MA, after an eighteen month process from planning to construction to test trials and Massachusetts Department of Health and USDA approvals. The company buys hogs from several Massachusetts farms and processes the entire animal into fresh cuts, cooked, and cured products. Joshua Smith, the owner, attracted significant funding ($600,000 - $700,000) to build the top-quality curing facility. Initially, the facility and HACCP plans achieved state approval and in the spring 2014, the company received USDA approval.

Beef

From December 2013 and April 2014, direct local beef to consumer sales averaged $8.27/lb. for finished, packaged, mixed retail cuts and $5.29/lb. for beef sold to consumer by hot hanging weight as a whole, half, or quarter. Direct from producer to retail or restaurant, accounts were paying an average of $6.12/lb. for finished packaged cuts. Assuming an average beef animal is slaughtered at 1,100 lbs., yielding a carcass to live weight of 57%, and a finished product yield of 60% of carcass weight, the average animal should yield about 375 lbs. of finished packaged cuts, which would translate into a gross profit of $2,295 to $3,101 when sold direct to consumers or retail accounts. Meanwhile, the national commodity prices for beef sold at auction are at historic highs recently given the drought conditions out west, resulting in prices ranging from $1.92 to $2.27 per lb. live weight, for an average gross income of $2,112 to $2,497 for the same 1,100 lb. animal.[65]

65 http://www.indexmundi.com/commodities/?commodity=beef

Local pricing data from interviews is found in the chart below.

Table 4. Local Pricing Data, Beef

Local Pricing December 2013-April 2014				
Beef		Max	Min	Average
Direct to Consumer	Mixed Cuts	$11.63	$6.00	$8.27
Direct to Retailer	Mixed Cuts	$9.00	$3.50	$6.12
Direct to Consumer	Hot, Hanging Weight	$7.00	$4.25	$5.29
Veal		Max	Min	Average
Direct to Consumer	Mixed Cuts	$9.00	$9.00	$9.00
Direct to Retailer	Mixed Cuts	$6.95	$6.95	$6.95
Wholesale	Hot, Hanging Weight	$2.75	$2.45	$2.60

Challenges facing local producers again can be reiterated in terms of cost, but most especially quality. As one Vermont restaurateur commented: "[There is] lots of inconsistency with "local" beef as far as fat, marbling, conformation, firmness and texture."

We should also consider veal as a viable option for some farmers. Local veal can be found for $9/lb. as mixed packaged cuts direct to consumer. Direct to retail or restaurant local bob veal was selling for an average of $2.60/lb. hot hanging weight or $6.95/lb. for mixed packaged cuts. Veal has important benefits from tender meat to cartilage to make rich stock.

The greatest challenge with veal surrounds decades of confinement "farming" in which animals endured inhumane conditions to produce pure white, tender meat. The current perception for many consumers still reflects these practices, even though a shift to grass and milk-fed, non-confinement veal has been in place for years. Pastured veal, while more flavorful, can be difficult to cook and even so, may not be as tender as some consumers expect. Veal producers can help sales by providing recipes and techniques to cook different cuts of meat.

Poultry

The poultry market is the only one in which a demonstrable difference in the price exists for "local" compared to "certified organic, local" product. From December 2013 and April 2014, direct local whole chickens sold to consumer sold at an average price of $4.52/lb., while certified organic, local whole chickens sold direct to consumers averaged $5.58/lb. Local chicken parts sold direct to consumer for an average of $8.31/lb.

Local whole chicken sold direct to restaurants or retailers sold for an average of $3.31/lb. and $4.68/lb. for certified organic. Local whole chicken sold to a wholesaler or distributor averaged $3.33/lb. Local chicken mixed cuts retail sold directly to restaurants averaged $4.69/lb.

Local turkey sold whole, direct to consumer averaged $5.25/lb. and $9.00/lb. for mixed cuts. Local duck sold whole, direct to consumer averaged $5.50/lb., while local geese averaged $5.00/lb. At the same time, Quebec duck sold direct to retailers and restaurants was available for $2.67/lb.

Compared to commodity sales during this same time frame, the commodity price for whole, live chickens ranged from $1.04 to $1.12 per lb. live weight for an average gross income of $4.50 to $5 per 4.5 lb. chicken. Direct to consumer or retail account sales would yield between $15-20 gross sales for the same chicken.[66]

Local pricing data from interviews is found in the chart below:

Table 5. Local Pricing Data, Chicken, Turkey, Duck, Goose

Local Pricing December 2013-April 2014		Per Pound	Per Pound	Per Pound
Chicken		Max	Min	Average
Direct to Consumer	Whole Chicken	$5.25	$4.00	$4.52
Direct to Consumer	Whole Chicken, Certified Organic	$6.65	$5.00	$5.58
Direct to Consumer	Mixed Cuts	$12.00	$6.00	$8.31
Wholesale	Whole Chicken	$4.05	$2.60	$3.33
Direct to Retailer	Whole Chicken	$4.05	$2.25	$3.31
Direct to Retailer	Whole Chicken, Certified Organic	$4.85	$4.50	$4.68
Direct to Retailer & Wholesale	Mixed Cuts	$8.15	$1.00	$4.69
Turkey		Max	Min	Average
Direct to Consumer	Whole Turkey	$7.75	$4.00	$5.25
Direct to Consumer	Mixed Cuts	$11.00	$7.00	$9.00
Duck		Max	Min	Average
Direct to Consumer	Whole Duck	$6.00	$5.00	$5.50
Direct to Retailer	Whole Duck	$2.67	$2.67	$2.67
Goose		Max	Min	Average
Direct to Consumer	Whole Goose	$5.00	$5.00	$5.00

66 http://www.indexmundi.com/commodities/?commodity=chicken

According to a local Vermont chef, local poultry is a "good value." He would prefer a 3.5 pound chicken and could use turkey year round as it is "relatively inexpensive and easy to work with" even if it is "quite a bit more than commodity."

Spent hens:

The most insistent demand has come from Burmese immigrants. In the last couple of years, some local egg producers started to slaughter the old hens and sell them for soup stock or stewing. Likewise, those farmers selling cut-up parts from meat birds, now freeze the backs to sell for stock. Consumer demand for these "by-products" adds value to each chicken divided into parts or the old hens.

Steps to Increase Production

Market demand is strong for locally raised poultry. Limiting factors to expanded production are grain prices, access to and cost of slaughter. Profitable poultry production requires sales of all available meat at the highest possible price. Chicken parts (breasts, thighs, wings, and drumsticks) offer significant opportunity for local farmers.

Eggs

History

Beginning in the 1950s the number of egg producing farms in New England decreased dramatically, particularly mid-sized producers, because growers could not compete with much less expensive eggs from outside the region. In 1963, Maine's production of 890 million eggs far outstripped Vermont's production of 145 million eggs.[67]

A few pockets of commercial scale production remained in Maine and Vermont but until the development of New Hampshire's **Pete and Gerry's Organic Eggs** in the 1990s, New Hampshire had almost no commercial egg flocks. Although the northeast is not a significant egg producing region, over the last decade, converging trends created favorable conditions for expansion in egg production. The demand for eggs from cage free hens increased as consumers reacted negatively to caged hens. Strong direct markets, growing demand for organic eggs, and interest from institutional buyers created considerable opportunities for growth.

Over the last three decades, Pete and Gerry's grew from a mostly local operation to a multimillion-dollar producer. The phenomenal growth of demand for Pete and Gerry's led them to work with 63 small farms, mostly in the Northeast, and the company is looking for as many as 10 new partners a year.

The grass growing climate in the Northeast, providing farmers in Vermont, Maine, and New Hampshire with a production advantage for raising livestock, does not benefit egg producers because so little of a hen's diet can

67 Chicken and Eggs Including Broiler Production. USDA Statistical Reporting Service, 1965, Production, disposition, cash receipts and gross income, 1963-1964.

be replaced with forage. Even free range hens with access to insects and worms require a significant portion of their diet from high quality proteins commonly found in grain. A recently passed Vermont food recycling bill might provide farmers with an opportunity to raise flocks with low feed input cost. However, the lighting and heat required to start chicks and maintain production through Northern winters remain significant expenses to consider.

Steps to increase production

Cage free and organically produced eggs command nearly twice the market price of conventionally produced eggs. However, the cost of housing and grain for cage free and organic production methods far exceeds the cost of conventional production practices. This limits the sale of eggs from most northeast farms to consumers interested in food production practices and standards rather than price point. Eggs can be sold directly from a farm or into retail stores with a minimum of regulatory oversight.

Chevon

Consumption of goat meat, "chevon," in the United States is less than 1 pound per capita even though goat accounts for 63% of all red meat consumed worldwide! In 2008 Robert Spencer of the Alabama Cooperative Extension System noted a significant increase in goat meat production and consumption in the southern US.[68]

The most common types of goats currently raised in northern New England are dairy breeds used for the production of milk. Very few farms are raising meat breeds, most commonly Boers or Kikos. Buckling goats for meat are available in large numbers starting in February because of the seasonal nature of the dairy goat breeding cycle. Some dairy producers manage does for spring breeding/fall kidding and some bucklings are available year round but not in the amount available from February to April.

Meat goats are raised easily in dairy barns no longer used for cows and can also be housed in efficient hoop style buildings. Although goats make efficient use of browse (bushes, small trees and woody plants), they also adapt to pasture and with proper fencing can be rotationally grazed. They thrive on forage based diets supplemented with grain. Depending on the intended market and time of year they are born, buckling goats can be ready for slaughter during any season of the year and could help to fill the "shoulder months" of February to August when typical demand for use of slaughterhouses drops off.

68 **Overview of the United States Meat Goat Industry** UNP-104, December 2008. Robert Spencer, *Urban Regional Extension Specialist,* Alabama A&M University

Pricing

A November 2012 survey of five ethnic grocery stores in Burlington VT revealed frozen, imported Australian goat meat available at prices ranging from $4.25 to $5.00/lb. Between December 2013 and April 2014, local goat sold direct to consumer averaged $8.14/lb. for mixed retail cuts and $10.00/lb. direct to restaurant. Commodity live goat sales averaged approximately $122 gross income per animal, regardless of weight.[69] Assuming a 54% carcass yield from live weight and a 60% yield of finished, packaged cuts from carcass yield, a 125 lb. goat would yield an average gross income of $330 to $405 when considering direct to consumer or retail sale.

Local pricing data from interviews is found in the chart below:

Table 6. Local Pricing Data, Goat

Local Pricing December 2013-April 2014		Per Pound	Per Pound	Per Pound
Goat		Max	Min	Average
Direct to Consumer	Mixed Cuts	$13.00	$5.00	$8.14
Direct to Retailer	Mixed Cuts	$12.00	$8.00	$10.00

Live Animal Markets

Sale of live animals for slaughter in custom exempt facilities might absorb a small number of meat goats. The live animal markets in New York City have significant demand. Because holidays for Muslims, eastern Europeans, Jamaicans, and Hispanics fall at different times throughout the year, a year round market exists for live animals of various sizes. In order to cover the overhead of transportation and make a profit, growers must ship sufficient numbers and adequate sized animals. Local regional markets exist for live goat sales to ethnic populations for example in Burlington, VT, Manchester, NH and Lewiston, ME, however, the ethnic market for live goats has high price sensitivity and is difficult to make financially viable for the producer.

Trends

In addition to "New Americans," appeal for goat is slowly broadening to a more affluent and educated consumer as these consumers become aware of the increased personal health benefits of goat meat (for example it is the leanest red meat) and of its lower environmental impact in comparison to other forms of protein production. These consumers will be looking for pre-packaged retail cuts. To service this market, particular attention needs to be paid to packaging and ensuring a tight vacuum seal as goat meat tends to dry out quickly.

Processing goat into value added products such as sausage and Violina di Capra (a Northern Italian goat prosciutto) or Mocetta (dry aged leg of goat) will increase the marketability of the animal. Although the processing

69 http://colbylivestock.com/goat.pdf

will add value to the meat, these will continue to be specialty products appealing to a limited customer base most highly concentrated in metro areas.

Steps to Increase Production

The limiting factor to the increase of goat meat production is establishment of year round demand at a price point that affords a return to the farmer. Factors contributing to production costs include fencing, milk or milk replacer, grain and perhaps most importantly, slaughter and processing. The price point versus yield will limit feasibility for sales to commercial accounts or restaurants. Selling to ethnic populations may be limited because of price sensitivity. The best market strategy would be to increase awareness to affluent individual consumers about goat as a gourmet meat with unparalleled health benefits (lowest fat content of any red meat). However, the adoption process will be long and slow. For those producers seeking to serve ethnic populations, they need to understand different cultures consume livestock at different ages or growth stages and raised according to different specific production practices. Following is a quick reference chart.

Goat Preferences of Various Cultures

- Burmese: old dairy (cull) females
- Bhutanese: castrated young males; older males are ok but they don't like female
- Muslims: male goats over a year old, preferably intact
- Africans (Congolese, Nigerians, Rwandans, etc.): generally tolerant of different varieties but prefer larger animals and not particular about male or female. They like 2-3 year old female Boer goats.
- Hispanics: Young milk fed kids about 15-25 pounds.
- Chinese and Koreans: Young goats about 60 to 70 pounds

Lamb and Mutton

History

Over the past 200 years, the U.S. sheep population has come full circle: from 7 million head in the early 1800s, peaking at 56 million head in 1945, and declining to less than 7 million head by 2003. As of January 1, 2013 the United States accounted 5.34 million head of sheep.

Trends

Compared to other meats, Americans do not eat large quantities of lamb; per capita consumption dropped from 4.5 pounds per capita (retail weight) in the early 1960s to around .88 pounds per year over the past two decades. In two national cross-sectional surveys reported by the National Research Council, conducted in 1977 and 1985,

1.3 percent of U.S. women and 1.9 percent of men ate lamb. While per capita consumption of other major meats has grown or held steady since then, total lamb and mutton consumption has generally declined since 1975. Attempts to promote American lamb failed, as the industry focused on high-value cuts for the domestic market and neither capitalized on market segmentation nor developed export markets. Much of the lower-value meat is turned into sausage.

Although the U.S. lamb market is characterized as a niche market, some producers focus on meeting specialty demands. Examples include producing dairy sheep, natural lamb products, or organic lambs with direct marketing of lambs. Although seasonal opportunities to sell lamb exist, especially at Easter, and New England has sufficient marginal grazing land, existing barn capacity from unused dairy facilities, and slaughter capacity to support lamb production, the high cost of slaughter often eliminates any profit to be realized from the small carcasses.

Lamb consumers prefer high-value cuts such as legs and loins, while farmers, processors, and retailers struggle to sell the remaining cuts. U.S. sheep growers do not grow more animals when returns from a whole carcass rest primarily on a few desirable cuts. Recent immigrants, eat lamb or mutton as a staple part of their diet, buy low cost New Zealand or Australian frozen lamb.

The real wholesale price for lamb is half what it was in 1978 and real prices received by farmers for lamb and wool are even lower. The long term trend in farm-to-wholesale price spread means producers earn a smaller share of declining revenues. Limits to marketing opportunities for lamb include low margin for producers and low consumption by consumers. Between December 2013 and April 2014, local lamb sold direct to consumer and direct to retail/restaurant was averaging $9.66/lb. mixed, packaged cuts. Meanwhile, during this same time period, commodity pricing for lamb ranged from $1.22 to $1.37 per lb. live weight.[70] If an average shorn, market weight lamb weighs 120-140 lbs. live weight, the gross sales from commodity auction would be $146 to $192 per animal. Assuming an average carcass yield of 54% of live weight,[71] and 60% of carcass yield as finished product, an average shorn, market weight lamb will yield approximately 39 to 45 lbs. of finished, packaged product, which at $9.66 per pound would generate gross income of $376 to $435 per animal.

70 http://www.indexmundi.com/commodities/?commodity=lamb

71 http://ag.ansc.purdue.edu/sheep/ansc442/Semprojs/2004/process/CarcassEval.htm

Local pricing data from interviews is found in the chart below:

Table 7. Local Pricing Data, Lamb

Local Pricing December 2013-April 2014		Per Pound	Per Pound	Per Pound
Lamb		Max	Min	Average
Direct to Consumer	Mixed Cuts	$13.50	$7.00	$9.66
Direct to Retailer	Mixed Cuts	$12.70	$5.95	$9.66

Rabbit

History

Although rabbit is standard fare in many European countries, it has never gained a strong foothold in the US. Globally, consumption goes up when other animal proteins become scarce through war or poverty. Rabbit consumption in the US spiked during World War II when the government urged families to raise their own meat. In 2014, while appearing more regularly on upscale menus and specialty groceries, fostered by increased interest in local food, overall demand is modest. Even as demand increases, volume remains quite small. In the 1990s, annual US per capita consumption of rabbit was estimated at a third of a pound, compared to Italy with annual consumption in excess of 11 pounds per person.

Production Capacity

In the Northeast, rabbits are reared commercially in elevated cages or grass-based "rabbit tractors." Year-round rabbit production requires winter housing but utilize grass-based systems during the summer months. Quebec's Eastern Townships are a significant rabbit production region with flocks averaging 200 does.

The prolificacy of rabbits contributes to profitable meat production. A doe can easily deliver six to eight litters of eight to ten kits per year and the young reach a market weight of five pounds in 50 to 60 days. A full grown meat breed rabbit doe consumes about 292 pounds of dry matter per year, even as she produces and feeds 50 to 60 offspring.

Facilities

Converted dairy facilities can easily accommodate large-scale rabbit production. However, whether a new or converted facility, designs must consider carefully the layout of cages for maximum labor efficiency for feeding, watering, and manure management. An efficient, well organized production system minimizes animal care labor, which can be as low as 6 hours per breeding doe per year. An estimate of 10 hours per doe per year should be used unless the facility is of significant size, such as more than 100 breeding does.

Depending on the scale of production, ventilation systems are necessary to maintain air quality especially during the winter. Ideally does are exposed to light for 15 to 16 hours daily to maximize fertility and mothering capacity.

Slaughter

Rabbits are "non-amenable species" meaning they do not fall under federal requirements for inspection during slaughter and processing. However, some states have regulatory requirements governing slaughter and the regulatory oversight of restaurants and retail must be researched in the state where the carcasses will be sold.

For example, rabbits produced in New Hampshire can be slaughtered without inspection and sold as whole carcasses from the farm to restaurants, distributors, and grocery stores without any regulatory oversight. However, if sold to out-of-state restaurants or retail establishments, the farmer must check with the state level interpretation of federal law in that state.

Vermont has a state inspected plant that purchases rabbits to slaughter and process for sales to restaurants and grocery stores.

Marketing Potential

There is moderate opportunity for increased production of rabbit in the study area. Developing relationships with individual stores and retailers will most likely be necessary to assure sufficient margin for profitability. Farmers are cautioned to develop multiple markets for rabbit meat. The authors are aware of situations in which producers invested significant capital to increase production only to be priced out of the market by a low cost competitor in less than six months.

Between December 2013 and April 2014, local whole rabbit was selling direct to retail for an average of $7.43/lb. (there was little data to be found on commodity rabbit pricing).

Local pricing data from interviews is found in the chart below:

Table 8. Local Pricing Data, Rabbit

Local Pricing December 2013-April 2014		Per Pound	Per Pound	Per Pound
Rabbit		Max	Min	Average
Direct to Retailer	Whole Rabbit	$7.70	$7.15	$7.43

Steps to Increase Production

While rabbits are year round breeders, personal experience indicates that facility size, winter lighting, and cold temperatures present challenges to efficient kit production. Conception rates decrease with cold temperatures and short day lengths. During cold temperatures does will often eat kits and during extreme cold, even well

nested kits will freeze. Use of auxiliary lighting might increase fertility but adding heat to increase survival rate of kits is cost prohibitive. As evidenced by subzero temperatures in March 2014, planned breeding for births during anticipated warmer months cannot always assure kit survival.

Likewise, rabbits are furbearing animals that normally live underground and are only active after dark. They have limited ability to withstand heat and require adequate ventilation during summer months. If rabbits are reared in hoop style barns, the facilities should be fitted with shade cloths.

As with any livestock system, feed is the single largest operating cost for rabbit production. Several grain manufacturers in the northeast produce high quality pelleted rabbit diets that will support commercial production. Most commercial growers, buying smaller amounts of grain, don't qualify for savings from bulk delivery. However, if needs are communicated ahead of time, a farmer might save some money if they buy a large amount of bagged grain in a single load.

Commercial rabbit farms in the northeast are often stymied by lack of technical expertise to manage health and production problems. Grain manufactures are willing to assist with nutritional concerns but are limited in expert knowledge for commercial scale rabbit management. Phone assistance from land grant universities outside of the region is helpful, but does not replace "in-the-barn" assistance.

Opportunities

Market demand for rabbit meat is relatively steady with a slight upswing during fall months and foliage tourist travel. Restaurants are the largest consumers of rabbit meat, followed by specialty meat and grocery stores. Conventional grocery stores do not normally stock rabbit meat.

Tangletown Farm: a diversified model to duplicate?

Lila Bennett and Dave Robb own a 188 acre farm in West Glover VT, where, with three young children, they raise an array of animals for meat and eggs. The journey has been both rewarding and challenging. In 2007, they bought a few laying hens to supply a school, where Lila taught, with eggs for its lunch program. In 2008, the nation experienced a major beef recall that included ground meat used at her school. Although working different jobs, in 2009, they bought a few steers to sell ground meat to the school. Realizing the operation could not make money with just ground beef, they set up a small meat CSA and then transitioned to the Montpelier Farmers Market as a monthly replacement... and discovered a huge demand for local meat.[72]

"We are a small Vermont family farm committed to providing high quality and well cared for meat to our

72 Interview with Lila Bennett and Dave Robb. April 14 2014

community. We were vegetarians for years and began to eat meat when, Lila, pregnant with our second child, began dreaming about roasted chickens! It became clear that all people need a diverse selection of healthy choices and that buying organically grown veggies from China and California is having just as damaging an impact on the world as factory farming. We began to buy more local products, chickens for roasting among them, and then to grow our own. Now, teaching our children about the direct connection from farm to table is another important part of why we farm. Leading an increasingly self-sufficient lifestyle and ensuring our food is cared for is what drives our inspiration for farming."

"We believe local food should be available to everyone. And everyone should enjoy great local food! Our country is at the beginning of a food revolution. Buying food that is grown close to home helps reduce our dependence on fossil fuels, reduces our carbon footprint, and supports our local economy! We farm so we can offer truly great, high quality meat that is tasty, healthy, and that can be enjoyed by our neighbors. It is very satisfying to see lots of happy healthy animals outside, nurturing the soil, being happy and then feeding us."[73]

Early on, Lila and Dave determined they could not make any money with 1,000 chickens nor would this number fulfill a goal to provide excellent meat birds to customers. This strong commitment to exemplary customer service contributed to early success, but created production challenges. The small farm in Middlesex and some nearby leased

Courtesy of Tangletown Farm

land was simply inadequate to raise chickens, steers, hogs, and other animals, plus managing the laying hens. Over a two year period, they searched unsuccessfully for a new farm near Montpelier.

Finally in 2012, through support from the Vermont Land Trust, they purchased the new farm, of which 100 acres are pastures. In addition, they lease a 10-acre farm across the road for the egg operation. Today, Tangletown Farm grows diverse proteins: free-range chicken, duck, guinea hen, and turkey; pasture-raised pork; and grass-fed beef, lamb, and rabbit; and oh yes, eggs! While the farm is not certified organic, the animals eat organic grains and grasses in pastures and from their gardens; they use no antibiotics or growth hormones.

Another key element was the purchase of a mobile slaughter house from the State of Vermont, after

73 Tangletown Website. **http://tangletownfarm.com/**

the unit did not fulfill its initial mandate. Now, with on-farm slaughter capacity for chickens (a State of Vermont inspector is at the farm on slaughter days), they can grow and process many more chickens and other poultry. For example:

- In 2009 and 2010, they processed approximately 1,000 chickens annually.
- In 2013; 200 turkeys; 7000 chickens
- In 2014: an estimate of 10,500 chicken
- Future growth: possibly up to 20,000 – 25,000 chickens!

The slaughter house enables them to process chicken parts to meet customer demand. At the same time, they accumulated hundreds of chicken backs without apparent value. However, as customers asked for parts to make stock and soups in the winter, they realized people wanted backs. Now selling frozen bulk packages direct to consumers, they no longer have a problem and make more money.

Tangletown raises and processes an impressive number of animals:

- Beef in both 2013 and 2014: 14 steers. Unsure about beef in the future
- Hogs: 43 (2013); 60 (2014); future 100 – 200. Still considering growth possibilities
- Rabbits in both 2013 and 2014: 1000
- Layers: 600 (2013); 1,400 (2014)

They learned the hard way, made lots of mistakes, but learned from each one. The animals taught them as well: groups of animals have different behaviors, styles, and "comfort zones." For example, laying hens want a routine; Lila and Dave learned that continuous changes for hens resulted in stress and fewer eggs. On the other hand, meat birds relate differently to their environments and you must pay attention!

Raising hogs is a risky business and takes patience and clear understanding of inputs and outputs. They grow Chester Whites (faster growing with good fat) crossed with Tamworth (slow growth and lean) to provide the right combination of growth rate and fat to lean ratios. It takes at least six months to grow an optimum size animal and you cannot grow a full-sized hog without providing feed. If it takes longer, margins quickly evaporate. They give feed to hogs, so beyond six months, the farm loses money.

The farm sees about one-third of sales direct to consumers at the Montpelier Farmers Market with the remaining two-thirds to retailers (Burlington's Healthy Living and City Market; Montpelier's Hunger Mountain Food Coop). Pete's Greens, located in Craftsbury, sells their eggs through its CSA. In addition, they contract with Pete's for common carrier distribution. On Monday, they slaughter chickens and other poultry; that evening, the chilled birds go to Pete's for packing into wholesale orders. On Wednesday, a Pete's Greens truck drives to Burlington, Montpelier, and Waterbury to deliver product; all meat shipped to local retailers and restaurants goes out fresh. In addition, they rent space for cold storage of meat. In the Fall 2014, Farmers to You in Calais VT will transport eggs to Boston markets.

Tangletown does very well selling at farmers market, but wholesale and retail markets are challenging. The farm wants to sell meat to restaurants and retailers that share the same ethics about food and animals. At the same time, wholesale customers want, sometimes require, the farm follow certain protocols for feed and slaughter, but then balk at paying a premium for the meat.

Lila and David see market possibilities in Newport and Jay Peak. The farm sells meat at the Northeast Kingdom Tasting Center in Newport; the Brown Dog Bistro and Butcher Shop handles their meat. They have a real concern about ability to sell products in the NEK, because current income levels are a barrier for large percentage of population. The Jay Peak Resort offers greater options, since the resort caters to vacationers year-round.

Words of wisdom

- As the farm grows, their vision changes, amplifies, adjusts, and hopefully, becomes clearer!
- Listen to the farm… it tells you everything you need to know.
- Watch, listen, and smell the weather.
- When they started, they had to make the farm work – necessity was the mother-of-invention. Now, they are evaluating what they most want to do in the future.
- They emphasis the great difficulty to make any real money; margins are thin, but not insurmountable.
- They learned how to apply other ideas to farming. Lila thinks sometimes the focus on success means you hear only the good stories, not the ones that reflect challenges, failure, and all of the hard work… sometimes too romanticized.

SPECIFIC PROTEIN BUSINESS OPPORTUNITIES

At both the regional and national levels, retailers and suppliers want more local protein. The authors analyzed individual proteins and offered recommendations for each option. They also interviewed several individual suppliers and retailers. Following are opportunities pertaining to each supplier or retailer. Please note, several detailed supplier and retailer protocols are included in the Appendices including production and processing protocols for Niman Ranch, Pineland Farms, the Global Animal Partnership 5 Step Animal Welfare Program, and Northeast Family Farms. Producers should evaluate the feasibility and desirability of each opportunity and the production protocols with respect to their farm.

Pete and Gerry's Organic Eggs

Pete and Gerry's based in Monroe NH wants new farms to raise hens and produce eggs. The company distributes eggs as far away as Pennsylvania and wants to return trucks full of eggs to be processed in its NH plant. Ideally, they would pick up eggs at a central location that houses 5,000 to 20,000 hens or several growers could each raise 500 or so birds and consolidate the eggs to reach the 5,000 mark.

The company offers various arrangements and contracts to farmers. Growers can own the hens and sell the eggs to Pete and Gerry's. Alternatively a farmer can build or renovate a barn and supply electricity, while the company brings in everything else (hens, feed, sawdust, etc.) and pays the farmer approximately between $.21 and $.26 per dozen (depending on the barn situation) to care for the hens and collect the eggs. Growers can raise cage-free or organic birds.

Contact

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Northeast Family Farms (Dole & Bailey)

Northeast Family Farms want more local producers; these farmers must incorporate NFF Live Animal Production Standards that **prohibit the use of hormones or sub-therapeutic antibiotics for any animal**. **All animals must be raised on pasture and fed a 100% vegetarian diet of grasses**, although different species may require some different feed requirements.

Beef

- British breeds such as Angus and Hereford
- Also fed silage

Pork

- Breeds such as Berkshire, Duroc, Chester White, and Gloucester Old Spot
- Also fed grains and must have deeply bedded pens

Lamb

- Small breeds such as White Dorper; also fed legumes
- Large breeds such as Suffolk and Hampshire; also fed grains and legumes

Contact

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Hardwick Beef

Hardwick Beef sells 100% grass fed beef primals to natural food stores in Boston and New York City. Customers select Hardwick Beef because they want to buy 100% grass fed beef, and because it is from regional animals. The primary competition for Hardwick Beef is 100% grass fed meat imported from Paraguay and Argentina. Customers average 1-2 sides per week, 50 weeks per year (Thanksgiving and Christmas reflect purchase of holiday turkeys instead). At present 40% is sourced from Vermont and 50% is processed in-state. The remainder comes from New York and Pennsylvania. Hardwick Beef wants producers who can coordinate finishing times so the company can ensure its buyers weekly supply throughout the year. Hardwick Beef, acknowledging the challenges to raise and finish 100% grass fed animals in our region, found the following strategies work well for their producer partners.

- Farms with a big barn can calve inside in February. When calves are 18 months old, a farmer can finish them inside over the second winter, so long as they are fed high quality feed (a mechanical mixing bowl is also necessary).
- Without winter facilities, aim for summer calving so animals finish 24 months later the following August.
- Animals are ready sooner with access to indoor winter facilities.
- Planting high energy annual grasses results in faster growing animals.
- Planting perennial grasses results in fewer, slower growing animals.

Hardwick Beef has technical consultants on staff to work with farmers at no cost to customize growing strategies based on the farm's infrastructure, land base, and grasses.

"Hardwick Beef is not reviving a 40 year old tradition, we're trying to do something new. We need young people committed, with a little bit of a chip on their shoulder... who want to show the world. We're looking for 'professional grass finishers.'"

Specifically the company wants:

- Professional farmers who know their mix of grass species. Knowing your soil and grass and adapting your strategy to the ground are key.
- Farmers who participate in the learning community, continue to learn, refine their operations, and share their knowledge.
- Producers who also sell their own beef. "We find that these relationships work best because they are able to make the higher margin needed from their direct sales, while supplementing their income and volume through selling to us. The marginal cost of keeping more animals, if they have the land base to do so, is pretty low. The farm benefits by making money, while the benefits to Hardwick Beef are that farmers, selling direct tend to appreciate the role Hardwick plays; they understand how hard sales and marketing are. Second, the farms who sell direct have more ability to get feedback about products from their direct customers so meat quality tends to be better." Hardwick Beef believes most farms can sell 10-15 beef direct and make a good margin on this while rounding out their income and production volume through sales to Hardwick Beef.
- British Breeds: Angus, Hereford, Devon, British White, Red Angus. "Short stocky animals that do well on grass."
- French breeds (Charolais, Limousin) do not do well. Highlands are a definite NO.
- "While we wouldn't write off working with dairy farmers we have had poor experiences in the past. We found dairy farmers really struggle with finishing on grass and we had issues being able to trust they are adhering to a 100% grass diet, especially if they are growing corn for their dairy herd."

Contact:

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Black River Meats

In 2013, Black River Produce launched Black River Meats to offer its customers locally grown animals with no antibiotics, hormones or "growth promotants" (sometimes referred to as cattle growth hormones or steroids; currently 30 growth-promoting products are marketed and monitored by the FDA for use in cattle in the United

States[74]) and fed 100% vegetarian feed. Black River Meats' customers are still highly influenced by price and are looking for the best value USDA Choice and Prime grain fed beef. The company wants more cow-calf operations (a cow-calf operation is a method of raising beef cattle in which a permanent herd of cows is kept by a farmer or rancher to produce calves for later sale[75]) and more local hogs, ideally also born and raised on the farm. Black River's goal is traceability of ownership and transportation from birth.

In addition to livestock, the company also needs more locally grown feed, especially corn silage and total mixed ration. The target for its beef is USDA Choice. "At 90 head per year you might be able to do that on 100% grass fed, but at larger scale herds such as 250 head per year, it will not be economically viable for our producers to be 100% grass fed, so we still need commodity grain." "This would be an ideal opportunity for Maine grain growers as their climate is more temperate and rocky so they can do more livestock and grow grain... there is no grass cutting and the land lends itself well to pasture." In addition to conventional grain, , the company is searching for sources of non-GMO feed, because it believes the top consumer priority in the next five years will be non-GMO fed animals.

Requirements

- Black River Meats adheres to the same protocols developed by Whole Foods Markets. The company also considers the protocols for Niman Ranch, Pineland Farms, and Dole and Bailey, looks for commonalities between them, and requires the same of its producers.
    - No antibiotics
    - No hormones or growth promotants (see FSIS website)
    - 100% vegetarian feed (no whey for pork)
- Angus breeds do very well in Northern New England because they handle the cold, steadily gain weight, and the carcass breaks out well (for Black River size matters; they want an Angus rib-eye to look like a mainstream rib-eye). Holsteins are desirable because they have a long loin but the animal doesn't yield good flat irons or skirt steaks. The company prefers Angus because they have the whole package – good loins, rib eyes, flat irons, skirts – the whole carcass breaks down well.
- The company wants farms with herds of 35-250 head that can supply a minimum of four animals per pick up, even if it's only one pickup per year. Alternatively, several nearby farms could work together and arrange a pickup at one location with a minimum of four animals from all farms combined.
- Black River looks for professional producers interested in learning and understanding how to properly raise a finished animal. Farmers must be concerned about breeds, genetics, and what animals eat.
- The company will work with small farms and help them grow. For example, it had one hog producer who started with 3 pigs, then grew to 25 and are now up to 60.

74 http://www.explorebeef.org/CMDocs/ExploreBeef/FactSheet_GrowthPromotantUse.pdf

75 http://en.wikipedia.org/wiki/Cow-calf_operation

Concerns

Black River Meats sees the "big challenge" as "folks who want to sell 50 head per year and quit their day jobs. Realistically people need to consider this an opportunity to supplement other forms of income and with this supplementation they can make a really good living."

Contact

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Pineland Farms Natural Meats

Pineland Farms Natural Meats in New Gloucester ME sells to Hannaford's, Whole Foods, Walmart, and Costco. Their product has to be edible, safe and perform to very, very high standards. While the company's animals come from Virginia, Pennsylvania, and Maine, they are looking for more New England livestock producers.

Requirements

- Farms must pass a third party animal compassion audit and participate in the Beef Quality Assurance Program that includes traceability to birth and record keeping (http://www.bqa.org/).
- Animals must be raised in an environment that minimizes stress.
- Pineland requires a vaccination program, fence line, weaning, early castration, and two-thirds of the animal's life must be spent on pasture.
- For efficiency and also because it reduces stress, Pineland requires a minimum pick up of 40-50 head per trip. (Note, it is possible the total animals could be from multiple farms located near each other and brought to one location to reach the 40-50 head minimum).

Contact

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Spring Hill Angus/NEK Processing

Spring Hill Angus is located in Barton VT. The company invested a significant amount of money to optimize genetics and develop a specific feeding program. They intend to process a minimum of 300 steers per year, have 500 breeding cows in the program with room for 250 steer per year being born on the farm. The program is a cow-calf operation in which calves are fed their mother's milk and pasture or best quality hay for the first 7 months. Then they transfer to the farm's feed lot where they eat a very specific feed regimen until ready for slaughter at 16-17 months of age. To accommodate the size and scale of this operation, the company owns three farms and is in the process of purchasing a fourth. It also built a USDA certified processing facility. Even with four farms, Spring Hill does not have sufficient land to accommodate all the breeding animals it needs, so it is looking for farms to raise feeder calves. The company needs at least 50 feeder calves per year born and raised from other producers. Bob Butterfield commented for producers raising only 30 feeder calves per year, income would be supplemental for the family. However, depending on the number a farm wants to raise, it could become full time enterprise.

Requirements

- Producers must be willing to use (purchase) the Spring Hill Angus genetics to raise feeder calves for the operation.
- The feeder calves must be from calf-cow operations in which the animals are raised on their mother's milk and pasture (or best quality hay) until weaning, approximately 6-7 months at which point the calves should weigh between 500-700 pounds.

Contact

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Whole Foods Market

Whole Foods consumers make their purchasing decisions based on price, but they also value "local" as a key attribute. The store separates its locally sourced meat from its Midwest product to make it easier to find. The "Vermont" label is a key attribute in New York City and New Jersey markets. Whole Foods partners with its producers to feature a different farm family each week as the point of sale for the meat counter. Whole Foods is looking "for more farmers to grow live animals for us."

Requirements

- Producers must be certified by the Global Animal Partnership 5-Step Program and pass a third party farm audit for animal welfare. http://www.globalanimalpartnership.org/
- Producers and processors must pass a third party food safety audit.

Contact

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John Nicholson

Meat Coordinator for New England
(Retired in February 2014; until a replacement arrives, contact the two other coordinators)

Institutional Sales

In 2011, the "**New England Beef to Institution Marketing Study**" documented increased institutional demand for livestock, particularly beef. Most of the need (86%) is for raw, bulk ground beef. Two current business models might be replicated on a regional basis to serve this demand: a producer and a processor driven model. The producer-driven model is designed for the institutional buyer who can control purchasing decisions and has an active desire and the time available to devote to sourcing local beef. In this model the relationship is direct sale between the producer and the institution. The processor-driven model services institutional buyers whose key priorities are streamlined processing and price (see details in appendix III). In this model, beef are aggregated and the product is sold by the processor.

Cull Dairy Beef- One Farmer's Profitable Operating Model

An example of another potential opportunity is a Vermont former dairy turned beef producer who has created a model of purchasing breeding age non-pregnant heifers and dairy culls at $1-1.25/lb. live weight, growing high quality forages for them, feeding no grain, housing them in a free stall former dairy barn. By not spending time on breeding or calving he's able to spend his time on marketing and producing high quality forages and has turned this into a profitable business, selling an average of 8 cows per month direct into restaurants and grocery stores at an average of $6/lb., and a dressed weight of 600 pounds per carcass.

Keys to success of this model are:

- Not spending any expense on grain
- Use the time freed up from not breeding and calving to cultivate markets.
- Source large frame dairy heifers and culls as they are naturally higher yielding carcasses

DAIRY

Across the study region small dairies are struggling to stay in the commodity fluid milk business. Whether conventional or organic, New England dairy farms face competitive disadvantages from larger producers and processors in other regions. Selling to a wholesale market at prices over which they have little control, many dairy farmers have been unable to withstand prolonged periods when milk prices do not cover the costs of production. In the **past twenty** years, we've **lost nearly half of all dairy farms in New England**.[76]

Some dairies address this challenge by implementing operational efficiencies, most notably replacing existing equipment with energy efficient models; exploring alternative forage/grain feeds to offset need for purchased grain; using alternative bedding to reduce cost of wood shavings, and expanding herd size to optimize ratio of fixed expenses per unit of production. A few farms with sufficient financial capital have invested in robotic milking parlors that allow individual cows to milk when they want. Such automated facilities may drive down labor costs, but initial investment is high and the equipment requires specialized technical skills to maintain.

Other dairies with the capacity and/or interest diversified into value-added products to capture more profit per unit of milk produced or explored complementary enterprises such as vegetables or livestock. The growth of artisan cheese, craft ice cream, and yogurt reflect a transition by some farms into value-added products. A few dairies banded together as small groups to pool efforts and resources with the hope of having more direct control over earnings (see discussion of MOO Milk – Maine's Own Organic Milk).

Unfortunately, although these approaches work in some instances, every New England state witnessed declines in the number of dairy farms. For example, between 2007 and 2012, states lost: Connecticut 31%; Massachusetts 43%; and Vermont 20%. Ironically, as the numbers of farms and cows decline, the quantity of milk produced has remained relatively stable. In Vermont, for example, production has only dropped 2% from 2003 to 2012.[77]

"Analyzing the regional numbers, the Mid-Atlantic States had 175,185 dairy farms in the mid-1900s; in 2007 that number dropped to 15,881. New England was once home to 27,780 farms that produced milk in 1950; that declined to 2,235 farms in 2007."

If we look at the New England and Mid-Atlantic States, home to nearly 69 million people (23% of the nation's population), you wonder why so many dairy farmers so close to this market would call it quits. Especially, since milk is a healthy food and a key source of nutrition.

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76 "**New England Milkshed Study**." American Farmland Trust and Tufts University. 2013

77 **www.nass.usda.gov/Statistics by State/New England /Publications/Annual Statistical Bulletin/vmilk2012.pdf**

One reason for the market decline is that people are drinking less milk. In 1945, the per capita consumption of milk was 45 gallons, the peak of individual consumption; by 1980, consumption declined to 27 gallons and today approximately 20 gallons. Cheese and yogurt are bright spots among dairy products, with consumption increasing significantly in the past several decades.

Another dynamic that contributes to the loss of dairy farmers is that dairy farmers are price takers not price makers. In other words, farmers can't sell their milk based on the cost of production but must rely on a Federal Milk Marketing Order system that originated in the 1930s to set the price. In the past decade, dairy farmers have experienced cyclical milk prices that have gone under production cost and have reached historic lows."[78] [79]

In 2014, milk producers are enjoying higher prices because of flat production in the United States over the past three years, a result of drought and high grain prices. The tight domestic supply and a strong export market driven by increased demand and drought in a few key countries that typically produce for the export market add to price pressures benefiting the farmers. Currently, nearly 18% of United States milk is exported to meet expanding markets in China and India.

Production Capacity

Strong demand exists for commodity milk in the northeastern United States. The capacity for profitable production of milk in the area of study is limited by:

- Access to larger **land base** for crop production and nutrient management
- **Forage quality and quantity**
- Cost of **feed**
- Adoption of **practices** to maximize cow comfort and production
- Access to **capital** to **update and improve efficiency of existing infrastructure**
- High **debt** load
- **Access to milk handlers** (for example conventional farms and milk routes in Corinth, Vermont were dropped when the only conventional handler still serving the area decided it was no longer cost-effective for the company, and ten certified organic farms in Maine were dropped. These were not new farms exploring dairying, these were working farms whose entire livelihoods depended on their milk handlers and who have now been stranded. Additionally for farms who are exploring entering dairying, they may not be able to find a milk handler willing to service them.)

78 Charles Kuperus, a Sussex Borough farmer, served as NJ's Secretary of Agriculture from 2001-2008

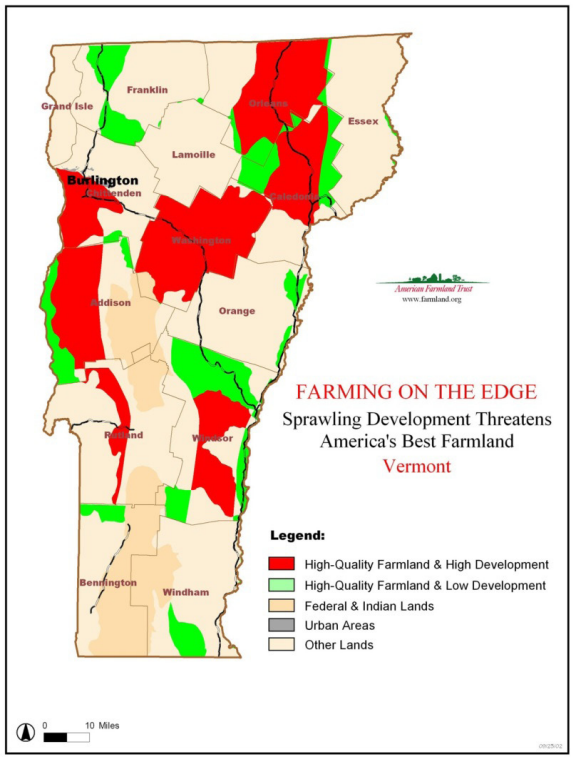
79 "**Got milk? More Americans aren't bothering**." *CBS Money Watch.* June 4 2014

These common threads run across all methods of milk production ranging from tiny herds selling organic, grass based raw milk on a seasonal basis to large herds using confinement housing and modern technology.

Land Base

Maps published by the American Farmland Trust show that even in the Northern Tier, there are portions of Orleans, Essex and Caledonia Counties in Vermont, Grafton County in New Hampshire, and Oxford and Franklin Counties in Maine that contain "high quality farmland" and yet are under "high development pressure."

Figure 1. Farming and Development Pressure, Vermont



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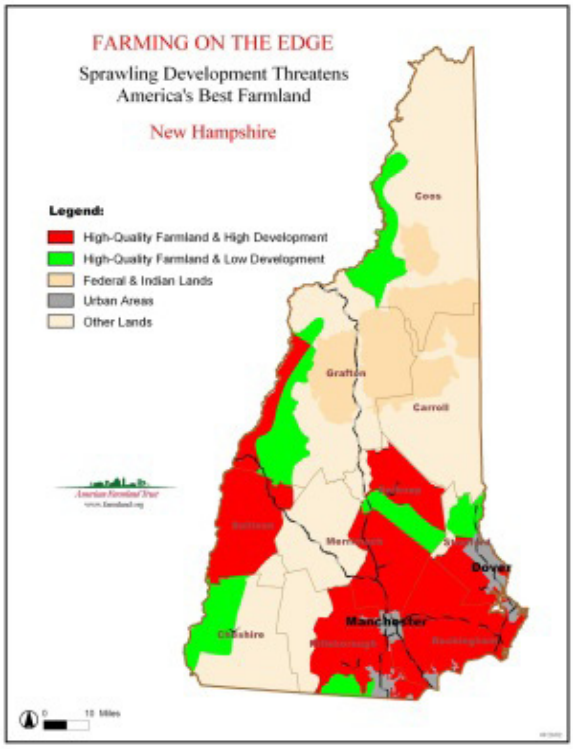
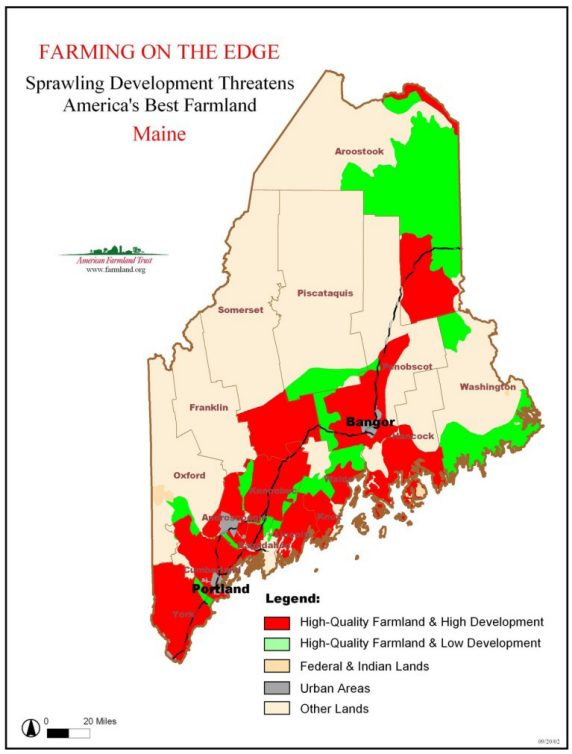
80 http://www.farmland.org/resources/fote/images/map_vermont300.jpg

Figure 2. Farming and Development Pressure, New Hampshire



81

Figure 3. Farming and Development Pressure, Maine



82

81 http://www.farmland.org/resources/fote/images/map_newhampshire300.jpg

82 http://www.farmland.org/resources/fote/images/map_maine300.jpg

Land use decisions must balance competing pressures for agricultural production, development, recreation and conservation. Legislation of land use practices can impact use patterns in unintended ways. For example, the requirement to buffer streams from tillage, nutrient application, and other crop management practices may reduce the value of small parcels of land for agricultural use and make them more prone to development pressures.

Forage Quality and Quantity

Profitable Northeast dairy farming depends on efficient production of high quality forages that utilize a variety of harvesting techniques. Maximum use of quality forages in dairy cow diets reduces expense and nutrient management pressure from imported grains and the prevalence of metabolic disorders caused by high grain diets. The forage management practices employed for grass-based farming are equally technical as those for production of annual crops such as corn silage. Production of small grains such as oats, wheat and barley can also play a role in dairy profitability, but a focus on forage production is paramount for healthy cows and healthy farms.

The University of Maine, the University of Vermont, and the University of New Hampshire employ faculty and extension staff to conduct applied and theoretical research and maintain testing laboratories to support the production of quality forages. UVM increased its number of agronomists by utilizing federal funds to partner forage production with water quality.

Practices to maximize cow comfort and production

University of Maine extension faculty said they do not get much participation in educational programming from many dairy farms in Oxford county. It is not clear if the farmers choose not to travel to the central locations where meetings are held or if they have little interest in meetings or seminars. Some organic dairy farms participate in the Farmington (Franklin County) area.

Most of the dairy farms in Oxford and Franklin counties have traditional, small tie stall barns and these facilities have not changed appreciably on most farms for quite some time. A couple of the larger farms made changes in cow comfort and one of the largest, milking over 400 cows, just completed a new barn designed completely around cow comfort with a special emphasis on bedding and environmental controls. The stalls are sized based on differing cow size to maximize comfort.

The amount of university support varies widely across the study area, as does its value to established dairy farmers. In Vermont, a forage variety demonstration for grasses and legumes is entering its third year in Caledonia County. Farmers are invited to field days throughout the growing season to observe the species as they perform under local conditions. Variety demonstrations for silage corn and forage brassicas are conducted annually in northwestern Vermont. Pasture walks during summer months bring seasoned farmers together with those new to the business to learn and share ideas.

Across the region, a variety of multi-state, applied research projects offer advice on cover crops, organic grains production, and forage and nutrient management. However, due to staffing constraints, few opportunities exist for one on one farmer support to implement procedures adopted through research.

In addition to university employees, other technical service providers such as NOFA-VT and NOFA-NH provide forage quality support; bring in outside speakers for workshops; and provide limited support directly to farmers. Maine Organic Farmers and Gardeners Association has a livestock specialist, but her expertise is not associated with forage production.

A review of information available to Maine and New Hampshire farmers indicates the availability of significant material and many workshops for new and beginning farmers and backyard hobbyists. While some resources explain new developments in crop production and forage varieties, most of the information appears very basic and of little value to established farmers.

The University of New Hampshire experimental station initiated trials to compare different grass harvesting techniques and the University of Maine is conducting a research project (feeding and pasture trials) on an organic dairy farm in New Vineyard.

Marketing Potential

In January 2014 the number of licensed dairy processors in Vermont grew to 100 separate plants ranging from tiny on-farm processors to plants of moderate scale that import milk from throughout the region. The total number of dairy processors in Maine closely matches the fluid output of the state with 71 processing facilities and a growing number of cheesemakers. New Hampshire has seen a growth of on-farm processing, almost all of it at the farmstead scale.

Some of the more notable changes are that in February 2014, Maine's premier, family-owned dairy processor, Oakhurst, sold the business to Dairy Farmers of America, a national cooperative of over 8,000 farms. DFI said it would continue to buy milk from all 70 Maine dairies. Also in Maine, in 2014, the short lived Maine's Own Organic Milk (MOO Milk) cooperative which had been viewed as a model for other regions to follow, closed due to lack of access to capital (see more in The Story of MOO Milk).

Barriers to Growth and Viability:

The key barrier to maintaining the viability of the Northern Tier dairies is access to capital. Access to funds is essential to help existing, smaller, and older dairies remain competitive and efficient, facilitating their ability to remain profitable in a world of tighter and highly volatile margins. Many of the region's farms would benefit from energy efficiency improvements but do not have the capital or are so burdened with debt they cannot be extended additional capital to make the improvements. Other dairies would be interested in some of the newer technologies such as robotic milkers, or improving pasture and forage quality but again lack the capital or access to capital to make the improvements.

For example, a New Hampshire conventional dairy in the study region received a complimentary NRCS energy audit that determined the farm could save 60% on its utility bill at an annual savings of $8,851, if they installed a $7,000 variable speed milk pump. While the audit was free, the ability to implement any recommendations was not. There were no "implementation funds," grants, or support to help the farm act on the recommendations. The audit revealed an opportunity to make lasting impact on the long term viability of an operation for an investment with a payback of less than a year and yet despite these positive merits, the farm's pre-existing debt and limited operating income precluded their ability to make the purchase. As of last contact the farm had still not found a way to finance the $7,000 pump.

Additional barriers include ability to hire and retain quality labor and an inability to plan due to the volatile nature of the current national dairy industry.

The Story of MOO Milk – a case study in the need for long term visioning, planning, fundraising, and timely execution in order to achieve long term success

In 2009, Hood Milk dropped ten small Maine organic dairies. After exploring options – sell their herds or revert to conventional milk production – the group founded Maine's Own Organic Milk (MOO Milk), a USDA certified organic operation. MOO Milk organized as a L3C, relatively new corporate structure that allows a company to receive grants and endowments like a nonprofit or a Coop. After several challenging years, the company gained its footing and both supply and demand increased. The company expanded to thirteen dairies and became a dominant presence in the Boston metropolitan area. While most of its milk was bottled, several processors made products from MOO Milk including Casco Bay Butter in Portland and Liuzzi Cheese, makers of fresh, hand-stretched organic mozzarella, in North Haven CT. However, MOO Milk was under-capitalized and relying on old and reconditioned infrastructure such as a used carton filling machine decommissioned by Oakhurst and donated to MOO Milk. In 2013, Norman Cloutier, founder and former CEO and chairman of United Natural Foods was introduced to the company by Slow Money Maine and invested $3.9 million in an equity round to help move the organization forward. Despite this influx of cash, in less than a year the organization was challenged by poor performance of the aging carton filling machine and lacked sufficient time to implement necessary upgrades for continued processing in order to maintain retail placement."[83] In May 2014, the company announced its closing and CEO Bill Eldridge said in a telephone interview that Stonyfield's yogurt-making facility in Londonderry, New Hampshire, had agreed to buy all of the milk from the company's member farms for the next three months, while MOO Milk arranged long-term contracts for member farmers with Stonyfield, Organic Valley, Oakhurst, and others.[84]

83 Moo Milk to End Production Press Announcement. Moo Milk Co. May 16 2014

84 *Bangor Daily News*. "**Maine organic milk producer MOO Milk to close**" May 16 2014.

The demise of MOO Milk highlights the challenges of operating a dairy business without necessary capital. **At the same time, the loss of this supplier leaves a gap for many retailers and dairy processors that need organic milk. Might the loss of MOO Milk create an opportunity somewhere in the region**?

Steps to Increase Fluid Milk Dairy Production

While Vermont and Maine dairy farmers are fortunate to have access to a wide range of technical assistance service providers, this is more of a challenge in New Hampshire. Within the study area, the Maine and Vermont producers, although on the fringes of geographic access to state level resources, still receive technical assistance programs because critical levels of dairy farms still exist. In New Hampshire the small cluster or remaining dairy farms for the most part lie outside the three northern counties.

Data collected by Stonyfield Yogurt during the summer of 2013 indicates approximately 17 organic dairies clustered along the southern borders of Franklin and Oxford counties, ME; five organic dairies in Coos and Grafton counties NH (none in Carroll county), one organic dairy in Essex county VT, and 44 more spread through Orleans and Caledonia counties.

The Maine and Vermont dairies are easily serviced by grain mills producing organic feeds in Barnet VT and Auburn ME. The New Hampshire dairies face greater challenges to access organic feed because of the small number and distance from a mill processing organic grain.

Dairy farmers and dairy processors and technical assistance providers often express differing opinions on necessary steps to increase milk production in the region. During the summer and fall of 2013, Stonyfield Yogurt hosted a series of meetings with farmers and technical service providers in the region to gather input on methods to support farmers in profitable production of organic milk. The technical service providers offered a list of ideas, including education and implementation for financial analysis, forage production, and grazing management. The farmers in attendance were very focused on the pay price and expressed little, if any interest, in technical support.

Opportunities for Fluid Milk Production

From data gathered from other regions of the Northeast, and from experience with the Vermont Farm Viability Program, the authors believe encouraging and providing farmers with the resources necessary to help them adopt a more businesslike approach to their operations would help address profitability of dairy production. In addition to Vermont's Farm Viability Program for example, Vermont also recently launched DairyVision Vermont, a farmer-led initiative to invigorate, assist, and support dairy farm operations to build innovative, successful businesses. Both the Farm Viability program and DairyVision Vermont are intended to provide one on one assistance to farms with service provider teams composed of experts well versed in various aspects of dairy operations and business planning to help the farms identify opportunities, challenges, and pitfalls in profitable dairy production and then develop effective solutions.

Examples of Innovation

Hatchland Farms in North Haverill NH milks 400 cows along the New Hampshire - Vermont border on the Connecticut River. What makes them distinctive is how their milk is sold and distributed. An article in *Dairy Star* describes it best:

"From the 1920s until 1963, Thatcher Farm had 250 cows and managed the milking, processing and delivery all from its Thatcher Street location in Milton. Fields on private estates were used for growing corn and hay used for feed.

"'But by the '60s, the town was changing. Milton had been pretty rural in the '40s and '50s, but it was becoming a bedroom community of Boston. Land was getting harder to find, and the barns were in need of a lot of work. We used to farm a lot of space that is now subdivisions,'" says Joe Manning, who delivers to homes built on land where he once baled hay. 'We decided to discontinue the farming part and kept the dairy open for another six or seven years, getting the milk from a farm in Vermont. Then we closed the dairy in '67 or '68.' Today, Thatcher Farm is a farm in name only. It relies on **Hatchland Farm in North Haverhill** [bold for emphasis], New Hampshire, to supply all its milk. 'They have 400 cows on the New Hampshire/Vermont border near the Connecticut River,' says Manning.

"'The farm is run by two brothers: one runs the farm and the other runs the dairy. In my opinion, there is no better milk. It goes right from the cows into a holding tank, then straight into the dairy where it gets processed. The milk is down here the next day.'

"The approach is a familiar one for many of the milk-delivery services in Massachusetts. Two of the area's largest home-delivery services receive their milk from elsewhere. Hornstra Dairy Farm in Hingham, which delivers milk in communities south of Boston, also gets its milk from **Hatchland Farm i**n New Hampshire. Crescent Ridge Dairy in Sharon, which delivers milk to 70 communities around the 495 belt, gets its milk from the Howrigan Family Farm in Vermont."[85]

Another noteworthy farm enterprise is the **McNamara Dairy** in Plainfield NH, a multi- generational family dairy, begun in 1950 by Bill and Hazel McNamara. The 140 cow dairy processes and bottles milk twice weekly... in glass bottles... and deliver five days a week. "In 1992, [Pat and Tom McNamara] began bottling their own milk on site, marketing to the nearby population centers in Hanover and Lebanon, N.H. Seventy-five percent of their milk is sold within a ten mile radius. Professors from Dartmouth College and doctors from Dartmouth- Hitchcock Medical Center are a great market for milk in glass bottles. The dairy maintains a 21,500 pound rolling herd average with 3.95 percent fat and a somatic cell count under 120,000. They don't test for protein, since it doesn't affect the bottling process. They intentionally produce more milk than the plant needs, ensuring that they are never sold out. Typically, over eighty percent of their milk is bottled on the farm, selling the rest in bulk. 'I'd hate to think my whole milk check was coming from that,' said Tom when talking about the milk sold to the commodity market."[86]

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85 Genevieve Rajewski. "**A Home Run for Local Milk: Delivered Right to Your Door**." *Edible Boston*. October 2010

86 *Dairy Star*. Andy Birch. **dairystar.com/print.asp?ArticleID=2931&SectionID=1**

DAIRY VALUE-ADDED PRODUCTS: CHEESE, BUTTER, ICE CREAM, AND YOGURT

We see considerable opportunities for value-added dairy with markets at every levels from local to regional and national. Each market offers unique possibilities and challenges.

"The advent of limited production cheeses with distinctive flavors and unique shapes coincided with other changes in the American palate. In the last two decades, demand soared for organic foods, the arrival of new immigrants fueled an expansion of ethnic foods and tastes, more Americans traveling abroad enjoyed different foods, and a strong vibrant economy created more opportunities for farmers, consumers, cooks, and chefs. As national food trends emphasized more regionally and locally grown fresh fruits, meats, vegetables, and other products, sophisticated consumers looked for small-scale... farm enterprises that practice sustainable agriculture."[87]

Demand

According to a 2012 National Association for the Specialty Food Trade Inc. report, *The State of the Specialty Food Industry 2012*, within the specialty foods market, **dairy product sales currently account for 18%** of total national specialty food sales or $6.2 billion annually (The next three tables come from the Specialty Food Trade report).

Specialty Dairy Food Sales 2011[88]	
Product	**$Billions**
Cheese	3.4
Yogurt and kefir	1.6
Milk	0.9
Other dairy alternatives	0.3

87 Jeffrey Roberts. *The Atlas of American Artisan Cheese*. 2007

88 These sales do not include Whole Foods, Trader Joe's, Walmart or private-label items.

According to the study, "Cheese and Cheese Alternatives, at $3.4 billion, are by far the largest specialty food category." At the same time, yogurt and kefir showed the second highest rate of growth across all specialty foods, at 96%, second only to shelf-stable, functional, beverages at 204%. Given the study data was from 2011, prior to the huge explosion of Greek-style yogurt production, these figures today are probably more dramatic.

When exploring dairy sales as an aspect of all food sales, specialty and non-specialty, dairy product retail sales account for 15% of total food sales or $37.5 billion annually.

All Food Dairy Sales 2011 (not Whole Foods, Trader Joe's, Walmart or private-label items)	
Product	**$Billions**
Cheese	12.5
Yogurt and kefir	4.9
Milk	15.3
Other dairy alternatives	4.8

The annual market share of dairy products whether a specialty food or a regular item is growing with greatest increases in yogurt, kefir, and fluid milk and when branded as a specialty food.

Sales Growth by Product Category (not Whole Foods, Trader Joe's, Walmart or private-label items)		
Product	**Specialty Food Sector % Change 2009-2011**	**All Sector % Change 2009-2011**
Cheese	10	8
Yogurt and kefir	96	19
Milk	18	10
Other dairy alternatives	14	8

The Specialty Food Trade data shows conclusive evidence of the growing demand for quality milk and dairy products. If anything, the diverse array of products from Greek-style yogurt to cheese to ice cream and pro-biotic dairy foods challenge markets of all sizes for shelf space. Distinctive, high-quality, dairy products, both artisanal and commodity scale should find opportunity for placement and growth. While initial entry might be most

easily gained through food coops, natural and specialty-gourmet food stores, large national food retailers like Walmart, Whole Foods, and Costco, together with regional ones such as Wegmans and Hannaford, offer additional opportunities. With the growing interest in "specialty foods" noted above, marketing the products as a "specialty food" will likely help them gain a higher rate of adoption.

As brands grow, be aware that moving from local to regional to national markets creates challenges for distribution, adoption of new marketing strategies, and increased pressure from competition, and with many food retailers will also require fulfilling their humane animal, quality, and food safety protocols and invoicing, ordering, tracking, and traceability accounting.

Artisan Cheese

Since the 1980s, the American artisan cheese movement has witnessed extraordinary growth in the number of producers and products with corresponding improvements in quality and safety.[89] Over the last dozen years, the national expansion accelerated; in 2000, we counted 185 producers and by 2006, the number grew to 411. **Between 2006 and 2012, the number of cheesemakers doubled to 826**; in some states, small-scale cheese companies doubled or even tripled in number. Such growth paints an optimistic picture about the future of small-scale farming and food production and may provide valuable models for dairies across New England and beyond to diversify and bolster their revenues.[90]

In 2014, **New England accounts** for at least **181 artisan producers; Maine** leads the way with **73** cheesemakers, followed by **Vermont** at **51** and **New Hampshire** at **12**. Southern New England accounts for: Massachusetts at 23, Connecticut at 21, and Rhode Island has one. Maine has the third largest number of cheesemakers in the country, while Vermont has the highest per capita number of small-scale producers.

Although New Hampshire has fewer licensed producers, state law allows farmers to sell aged cheese on-farm and at farmers markets without a license. However, they must label cheese with warnings about no inspection of products. At present, the NH Department of Agriculture does not have data on unlicensed producers, so the number of cheesemakers certainly exceeds the 12 licensed ones.

Maine's recent history reflects some interesting trends and consequently, intriguing questions. In 2006, the state counted 23 cheesemakers, several of which have well-established histories. Six years later, the number nearly tripled to 61 producers, and by 2014, another 10 companies were in production. Surprisingly, with few exceptions, Maine cheese stays home and most consumers beyond its borders have never heard of, let alone tasted, these excellent cheeses. This points to robust in-state markets, most likely direct sales and farmers markets. On the other hand, we wonder what size are these producers, can they make a living from artisan cheese or is the decision a lifestyle one in which making a profit is not paramount?

89 Jeffrey Roberts. *The Atlas of American Artisan Cheese.* 2007.

90 Jeffrey Roberts. "American Artisan Cheese: A Renaissance on a Fast Trajectory: 2000 – 2012. " Unpublished article.

The advent of the nearly 50 new producers since 2006, depicts other characteristics worth noting:

- Goat dairies and cheese play an important role in the expansion. In 2006, just over half the creameries featured goat cheese; in 2012, goats accounted for the same percentage. By 2013/2014, goat dairies accounted for 53% of all cheesemakers.

- Cow creameries and cheese grew equally over this period. In 2006, cow dairies accounted 47% of all cheese makers; in 2012, they were 56% of the total. In 2013/2014, the percentage dropped to 50% reflecting the more recent expansion of goat and sheep dairies. Because some cheesemakers work with both milks, the totals for cow and goat companies are higher than the actual counts.

- John Harker, Director of Market Development, Maine Department of Agriculture, sees homesteading as one component in the growth of Maine's cheese community and believes it reflects the **impact of the recession**. In his opinion, homesteaders turned extra land into dairy production and cheese.

- Women are key members of the cheese communities, especially with goat dairies. In 1979, Marjorie Lupien established Mystique Cheese in Waldoboro ME; today one of America's oldest goat cheese companies, Mystique helped pioneer both goat cheese and women as accomplished food producers. **Whether businesses owned by females or in farm families with women cheesemakers, their presence is key to understanding the growth in Maine**. In 2006, women accounted for 70% of owner/operator or family cheese businesses and their presence appears still strong in 2014.

Likewise, data for Vermont and New Hampshire reflects the significance presence of women in artisan cheesemaking. In 2006, women comprised 71% of Vermont cheese businesses; in 2012, the percentage was 63%. New Hampshire's 60% in 2006 grew to 75% in 2014.

- The tendency for women to focus on goats may reflect a level of comfort with smaller animals compared to cows, as well as an appreciation of goat's different dispositions and personalities. In many ways, they are attractive animals, easily worked, and if managed properly, a profitable dairy animal. The financial investment with goats tends to be less capital intensive, although by no means a bargain.

Very high demand exists for sheep cheese because of its unique flavors and texture and limited US production. Dairies face significant financial hurdles beyond the costs of start-up, production needs, and so forth. Sheep are seasonal animals and of all the dairy species in the States produce the least amount of milk. A cheesemaker operates for five months, then the facility sits idle the remaining months, while the sheep must still eat. These constraints translate into highly variable cash flow and in several instances over the past ten years, contributed to sheep dairies going out of business or expanding product lines in different directions. Several remedies include: freezing seasonal milk for winter production (sheep milk may be frozen without loss of quality); the use of cows' milk in the "off season."

- One critical element tied to these new businesses is the movement of many young people into farming and food production. We see many young entrepreneurs embarking into cheese and value added dairy products.
- Maine has the largest land base in New England and while sizable holdings are in timber, in many places land is relatively inexpensive and accessible. The Maine Farmland Trust works closely with young farmers and food producers to keep land economically feasible and productive.

Market opportunities and challenges

Overall, artisan cheese continues to experience **growth in consumer demand at state, regional, and national levels.** Beyond local retail and direct sales, artisan cheese appears in many small regional multi-unit supermarkets like Wegmans and large national ones like Whole Foods Markets and Trader Joe's. Even large conventional chain supermarkets carry an array of goat cheese, for example, something unheard of just a few years ago. All the data shows goat cheese production leading the expansion of artisan cheesemakers in New England and nationally.

Over the past twelve to eighteen months, concerns surfaced about the prospects for continued robust growth in consumer demand for artisanal cheese and the implication for production expansion. This past winter, several Vermont cheesemakers encountered an apparent saturation for cows' milk cheese in both New England and New York City markets. Their distributors told them they could not move the product. Many retailers expressed their suspicion that the extreme cold winter limited consumer demand. From small corner stores to a food coop in Montpelier and a cheese shop in NYC, both steady and foot-traffic customers dropped off. Everyone witnessed declines in sales and distribution of all foods from artisan to commodity. While we will need time to assess and understand more clearly the implications of this combination of slow sales and weather impact, the fact is several cheesemakers have copious amounts of product in storage.

Whether slow sales results from too many regional and national producers, too much similar cheese, the weather or a combination of factors, a caution flag is up for the future of the artisan cheese movement. Existing and new prospective cheesemakers must invest time to assess market access, demand for certain types of cheese, competition, distribution channels, financing options, and other factors. Beyond possible shifts in demand and weather, we must consider essential components of the cheese itself. In a 2013 study for a possible new Catskill Mountains cheese producer, the report concluded the following for the New York Metropolitan area:

"A very **high quality bar exists for artisan cheese** in the Metro area. Every retailer remarked about the challenge of adequate market and shelf space for a company's products. With intense competition, a cheesemaker cannot rely on labels, stories, or marketing to achieve success. Customers will pay high prices, but **expect outstanding cheese**. And when they buy it again, they expect the same quality. One retailer said: 'Consistency – absolutely the most important issue. There is far too much competition to sell cheeses that do not meet high quality standards.'"

In the authors' opinion, **these cautions regarding expectations of quality and consistency apply to all markets and all local food products.**

Education, Research, and Technical Assistance

Cheesemakers need educational offerings, research, and technical support; unfortunately, the region suffers a lack of these services, especially in microbiology and risk management. The former Vermont Institute for Artisan Cheese at the University of Vermont was a comprehensive resource for the entire region and beyond through its array of programs. To help fill gaps since its demise, **Sterling** and **Vermont Technical** colleges, in 2014 established new programs to teach the basics of cheese production. While excellent dairy resources exist for both cows and small ruminants across New England, no one program offers an integrated approach. The University of Connecticut is making serious efforts to build a strong dairy and artisan cheese program and may emerge as the key resource for New England.

Jasper Hill Farm and the Cellars at Jasper Hill in Greensboro VT provide aging services for artisan and farmstead cheesemakers. They also purchase young cheese from cheesemakers across Vermont and New Hampshire, age and resell it under the Cellars at Jasper Hill label. The company is building a top-notch microbiology laboratory to support their businesses. If successful, the lab may also serve Vermont and regional cheese companies with technical expertise. In addition, the Cellars, while collaborating with Sterling College's programs, offers a course through **Academie Opus Caseus**, based in France.

The stakes are too high to leave safety to chance. In our opinion, **NCIC and other funding agencies** engaged with artisan cheese production, must **advocate for these services**. Making distinctive, consistently high-quality and safe cheese requires support.

Regional Cheese Associations

With the exception of Connecticut and Rhode Island, artisan cheese associations exist throughout the region. While the organizations function differently, generally they help educate and promote each state's cheese community and products. They provide a forum for issues relevant to cheesemakers and have valuable roles as advocates around state policy and regulations and potential changes in food safety protocols, including the Federal Food Safety Modernization Act. Prospective cheesemakers and established ones should take advantage of whatever assistance and support available. Here are the current organizations and their Web links:

- Massachusetts Cheese Guild. **http://macheeseguild.org**
- Maine Cheese Guild. **http://www.mainecheeseguild.org**
- NH Cheesemakers Guild. **http://www.nhdairypromo.org/cheesemakers-guild**
- Vermont Cheese Council. **http://www.vtcheese.com**

Butter

With growing awareness of the impact of food choices on one's health, consumers express an increasing desire to decrease or eliminate the amount of artificial ingredients they ingest. They also feel disconnected with their food and want to reconnect with where and how food is grown. An outcome is a renewed interest in real butter versus margarine and "butter spreads." While demand for farmstead butters can be attributed to these concerns, we see a growing trend for flavored butters driven by convenience. Flavored butters save time when preparing meals. In the past year, Land O' Lakes, several dairy cooperatives, and Vermont Creamery all released a variety of flavored butters including honey, cinnamon sugar, maple, and garlic-herb.[91] [92]

A 2011 study of several Vermont small-scale butter makers and retailers in large metropolitan regions revealed the following:

> "The interviews with **retailers and wholesalers** point to markets both locally and beyond for **butter and buttermilk**. Although certified organic designation isn't always important, the interviewees emphasized the **value of local and Vermont** to consumers. The four Vermont outlets want local items and will vigorously promote these foods within their stores.
>
> "For all retailers and I would include any potential wholesale clients as well, the most important characteristic is quality – color, taste, flavor, and texture – they use the word **integrity** to describe product consistency**; a reliable item that arrives on schedule without flaws**. One of the most frustrating issues for wholesale and retail firms is inconsistent product and delivery. Any producer who can satisfy these demands can establish beneficial, long-term business relationships with clients. At the same time, if a butter maker fulfills these requirements, they should expect reasonable financial terms regarding turn-around times and payments. A working relationship depends upon both parties meeting the other's needs.
>
> "The overall message from butter makers may appear pessimistic, but they offer vital insight into the nature of production and the realities of the marketplace. One producer said, the work is hard and hot, facilities and equipment are expensive, and it takes significant time and energy to market, sell, and distribute dairy products. If a prospective producer can address these issues and still see potential profit from the work and costs involved, the markets are there. The use of social media may contribute important advantages to the farm; most of the producers do not use Facebook or Twitter, since they have established business relations. But for a start-up company, these links can build consumer identity and visibility.
>
> "Local and urban markets reflects a wide spectrum for both wholesale and retail prices. Most retailers were reluctant to provide a price point or range, since everyone wants a best product at the cheapest price! But based upon current price data, **both Vermont and New York retailers**

91 http://www.agmrc.org/commodities__products/livestock/dairy/commodity-dairy-profile/

92 http://www.vermontcreamery.com/cultured-butter-1

> **will pay a fair price for butter and buttermilk**. As one retailer pointed out, a producer must **set a wholesale price that makes sense to them** – input costs plus profit margin – and then negotiate with wholesalers or retailers. Know where your absolute minimum price is before you negotiate, but start higher. **You can negotiate down, but rarely if ever, negotiate up**."[93]

In 2013, the South Hero Land Trust (VT) commissioned a feasibility study of value added dairy products for local production. The study revealed the following about butter products and price points found in retail settings across Vermont and New Hampshire:

"Butter products ranged from commodity brand Shurfine, to slightly more premium regional brands, Land O' Lakes, Cabot, and Kate's of Maine in the standard pound category. Vermont Creamery and Kerrygold products were presented as gourmet offerings in smaller, higher priced packaging, and Horizon Organic and Organic Valley were available for those seeking certified organic products. The price for conventional and organic butter ranged from $2.99 to $5.19/lb. Gourmet butters ranged from $3.49 for 8 ounces of Kerrygold to up to $7.99 for 6 ounces of Vermont Creamery cultured butter.

Table 9. Butter Price Comparison

Butter Pricing	Low	Mean	High
1 Pound Conventional	2.49	3.74	4.99
1 Pound Organic	4.99	5.09	5.19
VT Creamery 8 oz. log	4.95 ($9.90/lb.)	4.95 ($9.90/lb.)	4.95 ($9.90/lb.)
Kerrygold 8 oz. log	3.49 ($6.98/lb.)	3.49 ($6.98/lb.)	3.49 ($6.98/lb.)
VT Creamery 6 oz. tub	7.99 ($15.98/lb.)	7.99 ($15.98/lb.)	7.99 ($15.98/lb.)

Features and Benefits of Premium Butter

What were the marketing tools and claims used to support gourmet butter's higher price points? How are brands conveying the features and benefits of their products? Kerrygold markets itself as "naturally softer pure Irish butter." Vermont Creamery cultured butter is marketed as "churned in small batches becoming a rich European-style butter with 86% butterfat content and unique farm-fresh taste." The creamery also provides suggested usage and cooking tips on their packaging, for example, "Use Cultured Butter at high temperatures for a perfect pan sear, or in pie crust and cookies for superior elasticity and flakiness. Taking perfection one step further, the Sea

93 Jeffrey Roberts. Farm Technical Assistance Project. VT Housing & Conservation Board. 2011

Salt Crystal Cultured Butter is a balance of creamy butter with the crunch of Celtic sea salt." In addition to their marketing claims, the packaging is also made to be more alluring."[94]

Yogurt/Kefir

As noted in *The State of the Specialty Food Industry 2012*, the fastest growing dairy products are yogurt and kefir, with Greek-style yogurt experiencing the largest surge in demand. According to a 2012 NY Times article, Julie C. Suarez, director of public policy for the New York Farm Bureau cited an estimate by Cornell University that New York farmers would have to increase milk production by 15 percent in the next two years to keep up with demand. The production process for Greek style yogurt requires straining the yogurt to make it denser, requiring three to five pounds of milk to make one pound of yogurt versus equal amounts in a traditional style yogurt.[95] Reinforcing the specialty food report, a study conducted in 2010 for farmers in the New York region by Cooperative Development Institute found alternative products such as yogurt or kefir had more demand than locally bottled milk.[96]

Two farms in Vermont produce drinkable yogurt/kefirs, **Butterworks Farm** in Westfield, whose regular and maple kefir sell for $2.99 per pint and **Millborne Farm** in Shoreham that offers five flavors of pint and quart sized drinkable yogurts.[97]

Market Potential

Although production and sales have accelerated in the past few years, the yogurt business is a difficult product for commercial feasibility. Among other challenges are so many brands from large national companies to local farms; consumers have extraordinary choices. While yogurt production is cost-effective because it uses all of the raw material, unless making Greek-style, competition for shelf-space and consumer attention is intense. In June 2014, Chobani Greek Yogurt laid off temporary and full-time employees at its Twin Falls Idaho plant. The company opened this facility because its New York State plant reached full capacity nor could they obtain sufficient milk. In addition, the company's success set off a huge scramble from other yogurt brands to capture part of Chobani's market.[98]

Ethnic Dairy Products

Another emerging market is ethnic foods. According to *The State of the Specialty Food Industry 2012,* Indian food is the second "hottest emerging cuisine" on the American landscape. The cuisine includes a variety of dairy products such as Lassis (a version of drinkable yogurt), paneer (cheese), and ghee (clarified butter). At present, the majority of Indian dairy products are imported to the U.S., representing an opportunity for American

94 Wilson & Andersen. South Hero Land Trust Feasibility Study for Value Added Dairy Processing in Grand Isle County. 2013.
95 William Neuman. "**Greek Yogurt a Boon for New York State**." New York Times. January 13 2012
96 Wilson & Andersen. South Hero Land Trust Feasibility Study for Value Added Dairy Processing in Grand Isle County. 2013.
97 Wilson & Andersen. South Hero Land Trust Feasibility Study for Value Added Dairy Processing in Grand Isle County. 2013.
98 "Chobani layoffs in Idaho will hit temporary staff hardest." *Associated Press*. June 3 2014

producers to enter the market. Capitalizing on this opportunity, DAHlicious Lassi formed in Massachusetts, leased processing facilities from Millborne Farm drinkable yogurt in Vermont, and now sells its product throughout the northeast and southern states in stores like Whole Foods. **A market exists for more competitors to enter; however, producers must understand ethnic products require a target market highly focused on metropolitan areas and regions of ethnic concentration**. Manufacturers, therefore, must recognize an increased effort is needed in distribution, distance to market, and targeted outreach.[99]

99 Wilson & Andersen. South Hero Land Trust Feasibility Study for Value Added Dairy Processing in Grand Isle County. 2013.

GRAINS, MALTS, MILLS, AND FLOUR PRODUCTS

Until the early to mid-19th century when the Erie Canal and railroads made it easier to move grain long distances, Vermont was considered the "breadbasket of New England" attaining a peak production of 19,320 tons per year.[100] Vermont grains and flour traveled to markets in New York, Boston, and Montreal. Similarly, Maine was a principal grain region and during the Civil War, Union soldiers ate bread made from Maine flour grown in Somerset and Aroostook Counties. Today regarded as a potato producing region, Aroostook was initially cultivated for wheat. During the wheat harvest the horizon in Northeastern Maine looks like the Midwest with huge combines traversing the land. Quebec maintains a strong grain production economy and grows large amounts of a wide variety of grains for both animal and human consumption.

Demand and trends:

A growing demand exists for both **food-grade and livestock grains, especially organic types**. The increase in consumer demand for local grains links in part to overall interest in local foods, as well as diet and health considerations, especially gluten-intolerance.

Over the past five to seven years, rapidly increasing **livestock grain prices** forced many farmers to begin grain production and/or look to local growers to meet their needs. Organic grain prices escalated even faster, a result of expansion of organic dairies, beef, and other meat and poultry operations that require organic feed. For example, in 2010, Organic Valley Coop and twelve of its dairy farmer-members established the **Maine Organic Milling** Coop in Auburn to meet a local need for organic feed. The enterprise reflects the significant demand and limited regional supplies for organic farmers to source grain for livestock. Blue Seal Feeds buys grain from farms in Northern New Hampshire for livestock feeds.

Beyond the need for livestock grain and feed, consumer interest in artisan bread and craft beer, coupled with health concerns about wheat gluten intolerance and over-processed grains, has sparked an interest in regionally-grown grains. Today, Northern New England states are experiencing a grain growing renaissance. In the 1970s, Jack Lazor conducted experiments to grow grain in Westfield VT. Considered a pioneer in Vermont's grain growing industry, he credits Quebec growers and their expertise as key to his success. In the late 1970s, Helen and Jules Rabin opened Upland Bakery in Plainfield VT and their European-style rustic breads became the norm in many kitchens across northern Vermont. The 1984 arrival of industry leader King Arthur Flour to Norwich VT, reinforced a consumer image associating the state with premium quality food and grain production.

100 Darby H., Wilson R., ***An Evaluation to Determine the Feasibility of a Multi-Purpose Grain Processing Facility in Vermont***, 2012.

Challenges & Opportunities

The challenges for local grain production parallel the more general ones of locally grown: what do consumers perceive as locally grown? How can we produce a quality product from our region? How can we be price competitive or change the dynamics of our food system such that consumers value and support the cost of local production?

Many consumers envision "local/craft" beer, flour, and bread to be synonymous with locally sourced ingredients. In fact, rarely is this the case. Value added producers must protect their product integrity and hard-won reputations. Their products must meet consumers' expectations especially consistent quality and offer the same satisfying customer experience again and again. Products must meet consumers' price sensitivity thresholds. As much as value added producers may want to support local production, they often require more standardized, affordable inputs than local producers can meet. Potential new markets include:

- Micro-brewers welcome local grains and hops, since they produce small batches, promote variability and differences as unique attributes of their beer that can command a premium for their product. However, in addition to the unique characteristics and variations, breweries must maintain consistent good product quality.
- Many craft brewers make "signature" brews or seasonal offerings and use a variety of local products – for example, spruce tips, maple syrup, pumpkins, or cherries – to create "one off production or limited edition batches." Because of limited availability, consumers seek out these highly-valued products and are willing to pay a premium price for them.
- The gourmet home chef and home brewer, who value local product, can justify the cost of local ingredients for personal consumption and cooking.

In 2012, a study by UVM Extension on the feasibility of a commercial grain mill in Vermont, found that for commercial bakers using local grains, the average size and scale of the operation came to 207 tons of all flours per year with local volume accounting for 56 tons. The study projected an opportunity to increase local grain purchases by up to 28 tons per year (50% of their current local volume).[101]

Along with local grains other ingredients such as hops are of interest to this same market segment and to craft distillers. Again, **quality, consistency, scale, and price are limiting factors**. For example, ninety-four percent of New England craft brewers expressed an interest in local hops, but price, product quality, ability to meet product specifications and volume are key factors in whether they would **actually purchase** local hops. If local growers could meet product requirements and price points, the New England craft brewing industry could support a minimum of 100 acres in local hop production.[102] Atlantic Hops, founded in upstate New York in 2010 to work with regional growers. The company looked to serve the New England craft brewer market through aggregation and pelletizing hops to provide the uniformity, quality, volume, and product format needed. In 2013, Atlantic Hops

101 Darby, Wilson. *An Evaluation to Determine the Feasibility of a Multi-Purpose Grain Processing Facility in Vermont.* 2012.

102 Wilson. *2009-2010 Feasibility and Market Research Study for Commercial Hop Production in New England.*

closed because it could not develop sufficient collaboration with growers to work together. The founder continues to believe it was a good idea, just ahead of its time.

To make local grains and hops more accessible and feasible, researchers over the last decade from the University of Vermont collaborated with New Hampshire, Quebec, and Maine colleagues. The projects experimented with old and new varieties of wheat, barley, buckwheat, oats, rye, corn, and other grains along with hops for yield, disease resistance, proteins, glutens, and other characteristics to identify ones suitable to grow across the North Country on a commercial scale and that could also yield the product requirements the brewers, bakers, and distillers need.[103]

In 2007, the **Maine Grain Alliance** in Skowhegan ME launched the "Kneading Conference" attracting hundreds of farmers, professional and amateur bakers, and hungry consumers. Since this time, the conference has raised visibility to key cultivation challenges, taught about good food and baking techniques, helped leverage new farm, processing, and production businesses, and fostered demand for local grains.

Maine with a topography, climate and geology similar to Quebec, has the potential for large scale, large volume grain production. For example, Aurora Mills in Linneus and Maine Grains at Somerset Grist Mill use only Maine-grown grains to mill flour and roll oats. Both companies work with state farmers to expand the varieties of available wheat and other grains.

MAINE GRAINS

Amber Lampke, owner of **Maine Grains and Somerset Mill**, was a volunteer at the Skowhegan Main Street Community project that launched the town's farmers market. She helped organize the first Kneading Conference; the meeting identified need for infrastructure and contributed to creation of Maine Grain Alliance.[104]

Somerset Grist Mill is located in the former Skowhegan Jail, a 14,000 SF solid building with lots of adjacent parking. Amber and her partner, Michael Scholz, purchased it for $65,000 and spent $1.6 million in renovations and milling equipment. While Maine Grains is the principal occupant, the building houses The Pickup CSA and Café, located on the ground floor, and the Skowhegan Farmers Market. They installed a commercial kitchen to "support baking education workshops, value-added food production for the Pickup, and nutrition and cooking classes for low income people."[105]

103 *An Evaluation to Determine the Feasibility of a Multi-Purpose Grain Processing Facility in Vermont*, 2012 Darby, Wilson

104 Interview with Amber Lampke. November 20 2013

105 **http://www.mainegrains.com**

The mill produces a variety of stone-ground flours, including hard winter and organic pastry types, oats, emmer or farro, and organic rye. They need at least 250 tons annually to make a profit and want to source the majority of grain from Maine. Since opening in 2012, the production growth curve hit the following benchmarks:

- 2012: 150 tons of wheat; 90% Aroostook County; 10% central Maine
- 2013: approximately 250 tons; 70% Aroostook; 20% central Maine; 10% NYS
- 2014 forecast: approximately 300 tons.

In 2014, the mill added several new grains:

- Cold-rolled oats
- Red Fife. In 2013, Whole Foods Markets contracted with them for a quantity of Red Fife, a Canadian hard winter wheat.
- Rye for bread, beer, and spirits. Some concern about climate conditions for rye with potential for ergot.
- Emmer; new grain for them
- Japanese buckwheat variety
- Triticale, a wheat/rye hybrid, generally used for animal feed, although some flour shows up in health food stores. If the company expands into animal feed, they must determine how to keep feed grain separate from ones for human consumption.
- Milky oats for medicinal tinctures
- Soybean
- Considering flint corn and spelt

The company works with growers in Aroostook County and all farmers pledge not use chemical fertilizers or pesticides on the grains. Obtaining adequate seed supplies for growers is an issue, but getting better, while appropriate harvesting equipment remains a challenge for both large and small farms. Harvesting equipment ranges from hand-harvest to horse-drawn and mechanical large combines. Most small seed producers harvest by hand to preserve quality and integrity of seeds. The mill itself, has a critically important need for heat to insure grain is complete dry. In the Midwest and Great Plains, the weather allows growers and elevator operators to fully dry grain before storage. Because Maine isn't as fortunate, an inexpensive heat source is essential. We discussed possible opportunities to work with the **Northern Forest Center's programs for small wood pellet furnaces**. Conceivably, this opportunity could be a win-win for forest and food producers.

Maine accounts for 60% of Somerset Mill's current market: Coops; natural food stores; bakeries; colleges and institutional food service. They bag 1 and 5 pound bags for retailers and larger volume for bigger clients. Beyond Whole Foods, New York City Greenmarkets sell the flour and several metropolitan restaurants use it in their kitchens.

Amber identified several challenges:

- Cost-effective distribution outside Maine and New England
- Technical support, especially business planning and management skills
- Training for expertise in grains and milling

A relatively new trend is the emergence of micro-malting enterprises to fulfill the demand from regional breweries. Supportive industries and the trickle-down effect, may then also be viable, for example, one proposed new enterprise, **Blue Ox Malthouse** Maine looks to open in 2014 to supply Maine and regional brewers with malts and custom products. Joel Alex, founder and owner of Blue Ox, argues craft brewing is cut off from local food and agriculture and asked "How [can he] encourage greater grain production for brewing?" He sees a new malting operation as a key component, since Maine grown grain goes to Quebec for malting. Wanting to buy Maine grain and believing Franklin and Oxford Counties could grow barley for him, Alex made this powerful argument for farmers to consider: "growing hay may gross $35 an acre, while commodity barley comes in at $200/acre!"

Two new Vermont malthouses – Peterson Quality Malt in Monkton and Slow Hand Malting in Hinesburg will join Blue Ox as the first malting facilities in Northern New England in years.

"Another part of the appeal of micro-malt houses is... they can produce unique, distinctive flavored malts that are identifiable to the region in which the grains are grown. Like grapes and hops, grains have terroir. The term 'terroir' refers to the effect the geography of a region, including climate, soil and water has on a particular crop. 'A malt house is kind of like a winery,' says Brian Simpson of **Riverbend Malt House** in North Carolina. 'Grapes from each winery are distinct to those soils. It's the same with grains. Different soils and climates produce different flavors.'"[106]

What about the Weather and Grains?

As described earlier in the report, the 2013 harvest for hard red winter wheat varieties, both conventional and organic, are in critically short supply. In June 2014, World-Grain.com published an update about recent rains in Kansas and the situation for the 2014 harvest looks even worse. "Some western areas of Kansas, as well as parts of Oklahoma and Texas had endured about half a year without significant precipitation only to have the rain spigot turn on at exactly the wrong time. And the 6-to-10 day forecast calls for above normal precipitation across much of the region where the hard red winter wheat crop has struggled through excessive cold, drought and now rain at an inopportune time."[107]

106 Ben Keene. "Rise of the Micro-Maltsters: Growing Number of Businesses Selling Locally Malted Barley to Breweries." *All About Beer Magazine*. 2013

107 "Rain comes at wrong time for Kansas wheat." World-Grain.com. June 10 2014

Last year, while the Central Plains wrestled with drought, the Northeast suffered through excessive rainfall and in some places cooler than normal temperatures. The weather impacted significantly the region's most prolific grain growing pockets: Addison County VT and Aroostook County ME. Randy George, co-owner of Red Hen Bakery, said:

> "Ben Gleason, who has been growing wheat in Bridport for over 30 years, had his worst harvest ever last year (because of too much rain– the opposite reason that the Midwestern harvest was so poor). We normally purchase about 1 ton of flour a month from him and in 14 years he has only come up short one other time. That was after the wet year of 2011. That year he was able to buy a few months' worth of wheat from Canada to keep his mill running. This year he ran out of wheat in January and was unable to find any organic wheat to purchase."[108]

As of July 2014, certified organic, high quality, Midwest hard winter wheat flour was selling wholesale for $1.06 a pound per 50 pound bag in Vermont. Even a commercial bakery committed to purchasing local grains, like Red Hen Baking Company in Waitsfield VT, can only buy a portion of their flour locally because of quality issues. Co-owner Randy George stated: "We're really only a few months into these wheat difficulties so time will tell how price, availability and quality will be affected in the coming months. Fortunately the flour from Quebec is good right now, so we feel very lucky to be able to make good bread with an affordable flour." Better wheat from Quebec makes a huge difference, since quality has varied and they cannot justify the additional cost.[109]

George described further the implications to Red Hen's retail and restaurant customers:

> "We had to raise our prices by about $.25 a loaf at the retail level. We were due for a price increase to catch up with increased costs of everything, but the sharp spike in flour prices put that on the front burner. We don't have the ability to raise the prices instantly to our retailers so we had a very tough month after the flour costs first went up and before our price increases took effect. As with every price increase we have ever done, we hear almost nothing from our retail customers in the way of complaints.
>
> To the contrary, when I wrote a blog post about the issues with wheat availability and pricing, we received several comments from people who wanted to voice their support in these tough times and were happy to pay what we needed to charge for our bread to make things work.
>
> Restaurants are another matter altogether. In that tight margin business, they really couldn't handle any increase. So we made the tough decision to start making a bread exclusively for restaurants that uses conventional (not organic) flour. We get it from a mill in Quebec that is a side project of Milanaise. They source all the wheat from Quebec and they are calling it transitional organic (although there is no certification for that). It comes to us for $19 a bag! I was not excited about moving away from organics even in a small way, but with sales in stores lagging lately and price woes on the organic side, I felt that we had to do this to hold on to our restaurant accounts. All but

108 Randy George interview. June 9 2014

109 *An Evaluation to Determine the Feasibility of a Multi-Purpose Grain Processing Facility in Vermont*, 2012 Darby, Wilson

> one of our restaurant customers has happily switched over to this non-organic bread (which we sell at a lower price than they had been paying)."[110]

An April 2014 update about grain prices from the Northeast Organic Dairy Producers Association said:

> "Unlike their conventional neighbors, 2014 does not look to be a profitable year for organic dairy farm families. There is no word of any increases in a base price despite increased demand and tight supply, and feed costs remain high, with producers hanging on to the extended MAP and seasonal payments to stay in business in the Northeast with a farm gate price of around $33 per hundred pounds. Western producers are suffering terribly from the drought and the high price of feed with some major producers and historical leaders of organic dairy in the West diversifying out of organic dairy. It's time for the processors to move away from regional payments and increase the pay price for Western producers to match their input costs. There is plenty of evidence of the need and if the processors are truly supporting the future of organic production rather than their own growth as companies or their future as salaried employees, then they need to recognize the needs of their member owners and their suppliers."[111]

Rice

Rice as a commercial Northeast crop is still an experimental crop and a fairly recent concept (2006) spurred on by a few specific farms including Akaogi Farm in Westminster West, VT growing on wetlands within a ten acre farm, and Boundbrook Farm (Erik Andrus) in Ferrisburgh, VT growing on approximately six acres. The Vermont Goat Collaborative in partnership with New Farms for New Americans is also working on test rice production with UVM Extension on five acres along the Winooski River in Colchester, VT.

As an outcome of Akaogi Farm's research, Cornell launched the Ecological Rice Farming in the Northeastern USA website, and has begun hosting an annual conference on rice growing in the northeast. Even on the website, the authors caution, "Although five seasons of experience has shown that growing rice is possible and productive at Akaogi Farm with yields of around 2 ton/acre, there are several issues and challenges... future management recommendations for small-scale rice paddy systems in the northeastern United States should take into consideration watershed issues, wildlife ecology, and agricultural requirements. In addition, providing education to growers and consumers about rice will ensure both a supply and demand. Addressing these issues through additional research, education, and outreach will support the ultimate goal of a sustainable rice production system for the northeastern United States."[112]

110 Randy George interview. June 9 2014

111 "April 2014 Feed, Pay and Retail Price Update." **Northeast Organic Dairy Producers Association**

112 **http://www.ricenortheasternus.org**

Beans

Vermont Beancrafters

Vermont Bean Crafters (VBC) is a recently launched company focused on resurrecting local and heirloom dried bean production in ME, NH, NY and VT. The company operates as an aggregator of harvested, dried, packaged beans, and a producer of value added bean products. VBC is also conducting R&D to help commercial growers optimize variety selection for yield and suitability with the growing region. VBC is seeking to establish contract growing relationships with growers across these states and asks anyone interested to contact them.

Contact

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NON-TRADITIONAL FOREST & TREE PRODUCTS

Dave Fuller, the University of Maine (Farmington) Extension Service expert in non-traditional forest products, enthuses about possibilities from the entire region for diverse, sustainably harvested, managed foods, and other products.

> "Fuller says non-timber forest products fit right into the local food and fair trade products movements. He said there needs to be a study of tourist preferences. Do they really prefer locally produced items?
>
> While useful and decorative items from the forest have to be competitively priced, what Fuller has found out in his research is that craftspeople from Maine to Minnesota and beyond almost invariably underprice their products. He routinely sees carefully crafted things, whether it's a birch bark photo frame or delicate basket or a beautifully designed twig wreath with dried flowers and seed pods from indigenous Maine plants, priced for only a few bucks when it should be selling for many times that.
>
> To a certain extent it's marketing. And that's where Fuller says some Mainers need help, learning how to read markets and price their goods so they get a fair return for their labor. The internet, however, has made marketing easier. On the internet you can tell your story, and the story of your personal product, in a way you can't in other media, and thus differentiate yourself from the herd, said Fuller. People want to relate to the person they're buying from these days.
>
> Fiddleheads get harvested pretty hard. Fuller did a multi-year study on a patch and found that the plants that were over harvested – where all the fronds were taken, even if only once a year, declined or died within four years, while the plants that underwent a single partial harvest in a year continued to be as healthy as ones that weren't harvested at all. It's a cautionary note.
>
> That being said, non-forest products do have economic potential. 'I think we need to capitalize on the fact that we're the most forested state in the United States,' Fuller said. 'I think there's some potential for unexplored medicinal uses of forest plants and trees. We need to look more closely at it. The University of Maine has recently started doing this.'"[113]

In a 2010 study of non-timber forest products use by residents of the St. John Valley in northern Maine, a trio of researchers from the University of Vermont and the U.S. Forest Service concluded that non-timber forest products "make substantial contributions to the economic viability and cultural vitality of northern forest communities."

113 **http://www.forestsformainesfuture.org/fresh-from-the-woods-journal/forest-products-its-not-all-about-logs.html**

In that study, titled "Culturally and Economically Important Non-timber Forest Products of Northern Maine," they estimated that northern Mainers used some 120 items from the woods and "established NTFP commodities including maple syrup and conifer wreaths **contribute more than $50 million to the northern forest economy annually**."[114]

Getting a handle on the numbers statewide, much less across northern New England region or the northern forest region, is so hard because most non-timber forest products aren't collected on anything even approaching an industrial scale. In fact, most are part of what could be considered **an underground economy**, but one that **provides part-time or seasonal employment for thousands** and a supplementary income for rural Mainers who often desperately need it.

"It's often a **cash economy**. It's appealing to folks because there are **low start-up costs** associated with it. Which is a great thing. We frequently **champion the cause of small business** people. But this is **even smaller** than that," Fuller said.

While rural populations in the three states are different, the concept of a cash or underground economy built around the forest seems very plausible for the entire Northern Tier. Is it possible to bolster these delicate arrangements without compromising the people involved or damaging the forest with the best of intentions? **The authors recommend NCIC explore with Extension service faculty, local experts, and Native American groups, the opportunities for forest-derived, sustainably managed foods and medicines.**

Maple Syrup

From **Vermont's Northeast Kingdom across Northern New Hampshire into Western Maine, maple syrup production is a highlight of the regional economy**. In addition to the economic value of the syrup itself, maple helps define the Northern Tier, generates public visibility and credibility, and attracts tourists, as well as residents. As the number of taps increases, coupled with new technologies that both speed sap transfer and water extraction, Northern Tier syrup production continues its dramatic growth. Vermont is the nation's number one producer; in 2013, the state made 1,320,000 gallons; New York at 540,000; Maine 420,000; and New Hampshire 124,000 accounted for the Northern Forest totals.

Equally important, consumers recognize these states for quality syrup. Because Quebec is the world's number one producer, large quantities of bulk syrup move over the border. Labeling laws, like those in Vermont, means that Northern Tier producers may have a marketing advantage over Quebec syrup in the States. One indication of the Northern Tier region's untapped potential is the recent announcement of a Canadian company setting up business in Island Pond to expand sap quantities and syrup output. The new enterprise is owned by Les Industries Bernard:

114 **http://www.forestsformainesfuture.org/**

"A leading [Quebec] supplier to such [Canadian] grocery chains as Loblaws, Provigo and Maxi, recently signed a deal to lease the 15,000 sq. ft. Ethan Allen factory space in Island Pond VT at a rate of $1/sq. ft. with the lease payment going towards purchase price of the building ($250,000). The company has also submitted plans to expand the facility by another 5,000 sq. ft. 'There are a few cultural and historical factors that explain why Quebec's maple industry is so much more developed than Vermont's, [Mr. Bernard] said. It was a labour-intensive industry and with the large French Canadian families, you had the labour to do that. Now, it's looking more like a mature industry on this [Quebec] side of the border. **If you look at it from a maple-tree point of view, Vermont and Northern New England have 10 times what we have in Quebec. We've tapped at least 50 per cent of the trees in Quebec and in Vermont it's 2 per cent. You've got a huge potential there that's not been looked at**. "That's the appealing part to us. There's just so much out there that no one has touched. We can't really figure out why somebody hasn't thought of this before.' The company will create 30 to 40 new jobs in Vermont at the outset, but could easily create "hundreds" more over time as production is expanded."[115]

The Bernard family has been making syrup for 200 years and has built the kind of expertise that can successfully develop Vermont's potential. The facility will service some of Bernard's large corporate accounts in the U.S. The plan is to start with 100,000 taps, growing to 1 million over time. A significant amount of the taps are expected to come from land leased from timber holding companies such as Plum Creek that owns more than 86,000 acres in northern Essex County. Essex County has the third highest number of maple trees in the state.[116]

Revolutionary New Technique

A key concern for the long term viability of our region's maple production is climate change. Maple trees need a winter period of below freezing temperatures for dormancy and plant health. Researchers fear shorter, warmer winters may lead to the disappearance of maple trees across Vermont, New Hampshire and Maine by the end of the 21st century. In a potential answer to this, a group of researchers stumbled on a technique that may allow for continued maple production, albeit without the majestic trees. "Their new technique uses tightly spaced plantations of chest-high sugar-maple saplings. These could be single stems with a portion — or all — of the crown removed. Or they could be multiple stemmed maples, where one stem per tree can be cut each year. Either way, the cut stem is covered with a sealed plastic bag. Under the bag, the sap flows out of the stump under vacuum pressure and into a tube. Voilà, huge quantities of sap."[117]

115 "Quebec firm tapping Vermont Maple syrup potential." *Montreal Gazette*. September 2013

116 "Quebec firm tapping Vermont Maple syrup potential." *Montreal Gazette* & *Barton Chronicle*. September 2013

117 Joshua Brown. "Remaking Maple: New method may revolutionize maple syrup industry." UVM Communications. 11/6/2013

Birch syrup and other products

Darrell Bussino and Bucky Shelton, maple sugar makers from Glover, VT are exploring an idea that evolved in Alaska: **birch syrup** made from paper birch trees that retails for **$300/gallon**. The maple sap to syrup ratio is 40:1 and sells for $55 - $65/gallon, while the birch sap to syrup ratio is closer to 100-150:1, hence the extraordinary difference in price While these ratios seem daunting, advantages exist in New England. Because birch season follows maple, it extends a sugarmaker's season and provides supplemental income and improved cash flow without interfering with maple activities. The **two seasons** leverage existing fixed assets and increase return on investment of equipment and infrastructure. Challenges include that birch sap is easy to burn, the low sugar content makes it expensive to boil down, especially without reverse osmosis, and the season is short. A 2014 article in the *Barton Chronicle*, notes that Northeastern State Research Cooperative recently conducted a study on the feasibility of birch syrup in the Northeast. Abby van den Berg of the Proctor Maple Research Center, principal investigator of the report, said unless you have a lot of trees, it may cost up to $200/gallon to produce. Each Vermont paper birch tree, however, can produce an average 18.3 ounces of syrup annually, and if the product can command $300/gallon in gross sales, then there still may be room for profitable production.[118]

Another well-known birch tree is the black birch, found predominantly in the southern Appalachians. During the last century, black birch filled in places where losses of American chestnut and oak and more recently hemlocks killed by the woolly adelgid opened large forest areas. Since the tree prefers warmer temperatures, if regional temperatures continue to warm, a strong possibility exists the tree will extend its range northward and Northern Tier businesses might develop new regional products.

Native Americans and colonialists prized black birch leaves and bark as medicine and to make oil of wintergreen. "…. The best known non-timber product from black birch is birch beer. Donald Culross Peattie, in his 1940s book, *A Natural History of Trees in Eastern and Central North America*, describes the process: 'Tap the tree as the Sugar Maple is tapped, in spring when the sap is rising and the buds are just swelling; jug the sap and throw in a handful of shelled corn, and natural fermentation – so the mountaineers tell us – will finish the job for you.'"[119]

Nuts

Individuals own a considerable portion of forested land across the study region and many of these private holdings are prime for silviculture management to produce desired hardwood and nut trees. Interest exists to develop edible tree nut cultivation and harvesting in the region, since American nut trees have a long history of use in New England for food and timber, especially for furniture. The list includes:

- American chestnut. Prized for wood and food. Although decimated by blight, new hybrid chestnut trees offer promising possibilities to return the tree to New England forests.
- Black Walnut. Prized for wood and food.

118 http://bartonchronicle.com/vermont-sugarmakers-turn-birch-syrup/

119 http://northernwoodlands.org/articles/article/black_birch_betula_lenta

- Beech tree. Prized for wood and food
- Butternut. Scarce; for food
- Hazelnuts. Several native North American hazelnut trees as well as hybrids offer potentially significant production. For example:

"Hybrid hazelnuts from Arbor Day Farm combine the characteristics of two North American native species, American and Beaked, and the European hazel. Originally crossbred in Minnesota, these shrubs will likely produce sweet, tasty nuts in approximately 4-5 years. A yield of up to 7 pounds of nuts per bush may be expected from well-established plants. Plant in a sunny area with enough space for 2-3 bushes to help assure cross pollination by the wind. They form a dense, multi-stemmed shrub up to 15' tall and 10' wide with deep, fibrous roots that grow well in most soils, but prefer acidic to neutral, moist, and well drained. Avoid heavy clay, shallow hardpan, or marshy soils. In addition to producing nuts for your personal enjoyment or market, hazelnut shrubs have a high wildlife value providing food and nesting and hiding cover for many birds and mammals."[120]

Looking towards the future, with warmer global temperatures, hickory and pecan trees may have a place in the Northern forest. In addition, hogs fed with nuts – acorns, hazelnuts, peanuts, walnuts – produce very distinctive meat. As ancient forest animals, hogs are natural foragers and the fall season of abundance nuts helped fatten the animals before winter. In Italy, Spain, and Hungary, heritage pork breeds, feeding extensively on fall nuts, put on a final layer of fat, while the nut meats impart distinctive flavors and aromas to the meat. Even now, in states like Oregon (hazelnut-fed hogs) and Virginia (acorns, black walnuts), growers established rotational grazing regimens in hardwood forests. The result – the pigs are happier and the end product highly sought after. [121]

Medicinal Plants, Herbs, and Neutraceuticals

Beyond timber, wood pellets, and other traditional products, forests and cultivated beds are a potential source of **medicinal plants, herbs, and neutraceuticals**. Both Native Americans and people living in the North woods have long harvested a wide variety of plants for personal use. **The region has significant capacity to increase production of pharmaceutical grade, therapeutic, and medicinal herbs to support the growing worldwide demand for these products**. Such products from the Northern Forest fulfill the desirable characteristics of traceability, production standards, and quality metrics. Northern Tier forests offer an ideal opportunity, especially given the competition is predominantly overseas with questionable oversight on harvesting and production methods.

Examples of herbs and edibles with potential value as medicines, flavorings, and neutraceuticals:

- Witch hazel
- Birch, root, and spruce beers

120 **www.aborday.org**

121 Kathryn Shattuck. "Let Them Eat Acorns: Preaching the Gospel of the Forest-Fed Pig." *New York Times*.12/30/13

- Spruce gum, a non-petroleum based chewing gum! From a sustainable and environmental perspective, natural spruce gum contrasts to petroleum-based commercial gums. Spruce gum costs upwards of $250/lb.
- Spruce tips for flavoring beer and gin
- Dandelion for edible greens and flowers for wine
- Elderberry
- Burdock
- Holy basil and oregano
- Mint and wintergreen
- Juniper
- Chaga

Chaga grows on rotting birch trees, of which the Northern Tier has millions of paper birch. "Relatively unused in the west, chaga is a potent immune enhancing agent that is highly popular in Russia and parts of Europe, and it enjoys a major body of science for its health benefits. Chaga is rich in natural antioxidant and anti-inflammatory phenols, containing the compounds betulin and betulinic acid, which derive directly from host birch trees. Both betulin and betulinic acid demonstrate anti- tumor effects, which explain why chaga is known as an anti-cancer agent. Additionally, some science shows that betulin can play a beneficial role in controlling metabolic disorders, such as obesity and metabolic syndrome. A group of compounds in chaga called lanostanoids also appear to play significant anti-cancer roles."[122]

Finally, although foraged mushrooms and chaga, fiddleheads, and ramps remain key wild foods, the best collecting areas are under considerable stress. We continue to lose land to development or indiscriminate practices that destroy fungi and plant habitats. **The greatest concern is over- harvesting of wild foods; a combination of reckless harvesting with difficult weather can compromise these wonderful resources**.[123]

Another exciting and important resource is Rosemary Gladstar, owner of Sage Mountain Herbal Retreat Center and UPS Botanical Sanctuary in Barre VT. Rosemary is a pioneer in the herbal movement and known as the "godmother of American Herbalism." Founder of the California School of Herbal Studies, the oldest herb school in the United States, she wrote several books and The Science and Art of Herbalism, a home study course. Rosemary is the director of the International Herb Symposium and the New England Women's Herbal Conference held annually in NE. Rosemary is also co-founder of Traditional Medicinal Tea Company and did all of the original formulations for the company. At present Rosemary is working with other herbalists in Vermont on a 2014 SARE grant application to fund a feasibility study for the launch of a Vermont Herb Growers Cooperative.

In addition to these plants and herbs, a 2013 study for the redevelopment of the Groveton Mill in Groveton, NH found that therapeutic marijuana could be produced profitably in indoor growing, hydroponic conditions.[124]

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122 **http://www.foxnews.com/health/2013/05/29/chaga-potent-immune-enhancing-fungus/**

123 Tyler LeBlanc. "**Why There's a Black Market for Ramps in Quebec**." *Modern Farmer.* June 2, 2014

124 Business Planning Associates, ***Groveton Mill Site A Study of Business Enterprises to Occupy the Site***, 2013

CULTIVATED "WILD" PRODUCTS

We **advise strongly not to make wild forage or harvest** a direction for NCIC. Rather appropriate, sustainable practices must underpin any harvesting.

Mushrooms

Specialty, organic mushrooms are the fastest-growing segment of the U.S. mushroom market. Direct-to-consumer; wholesale; retail; and restaurants are paying $16.00 – $20.00/lb. for cultivated and sustainably harvested, organic, fresh and dried wild mushrooms.

Production and potential markets:

While current mushroom production in the region is very limited for both cultivated and wild mushrooms, **producer interest is growing rapidly**. A 2010 SARE grant to Cornell University, University of Vermont, and Chatham University entitled the "Shiitake Mushroom Project" aimed to reach new producers in New York, Pennsylvania, and New England and teach them how to grow Shiitake mushrooms for commercial production. The goal of the three-year project was to develop a group of commercial mushroom growers in the Northeast with production of 100 to 500 logs per year and create a supply and distribution chain to pay a fair price to growers.

"In January, 2014, the project team published a guide for growers who want to explore shiitake mushroom cultivation on their own land. Shiitake mushrooms are the second-most cultivated variety in the world, and the demand for locally produced, log-grown shiitakes is high among chefs and consumers. According to the guide, 'Forest cultivation of shiitake mushrooms can generate income, diversify farm and forestry enterprises, add value to forestry by-products and create opportunities for timber stand improvement.' At publication time, these mushrooms sell for $10-$18/lb. across New England." [125]

In addition to the result of the SARE grant, other growers have popped up independently in the Northern Tier project region. These include Wildbranch Mushrooms in Craftsbury VT; Pierre & Micheline Miron-Freysonnet and New Hampshire Mushroom Company in NH; and Toshio and Kalin Hashimoto of Shiitake Farm in Rumford ME. A stalwart of the industry, the Oyster Creek Mushroom Company, established in 1989 in Damariscotta ME, sells fresh and dried wild and cultivated mushrooms direct to consumers, restaurants and via mail order.

Founded in 2011, Mousam Valley Mushrooms, in Sanford ME takes a complementary approach. The owner, Robert Sharood, has an interesting view concerning "human – fungi relationships." He argues eloquently for

125 2014 Report: "**Best Management Practices to Log-Based Shiitake Cultivation in the Northeast**"

greater research and knowledge about the essential value of mushroom to human health and evolution. He does not harvest wild mushrooms, rather collects a sample for its mycelium and then clones it to produce crops. Recognizing the value-added opportunity to use hardwood logs to grow organic mushrooms, Robert uses timber, not destined for furniture or other similar uses, from Maine's Northern forest and currently grows several types of oyster and shiitake mushrooms. The company also harvests chaga from Northern forests. They are the only year-around cultivated mushroom operation in Maine.

After developing his proprietary process, Robert's initial production was in a 4,000 sf. facility that averaged 20 lbs. a week with sales to Hannaford and Whole Foods markets in Portland ME. In 2013, the company averaged 100 lbs. a week and in the fall 2013 completed a new facility. In 2014, he estimates an average of 400 – 500 lbs. a week and Sysco will handle wider distribution.[126]Currently the business has six full time employees; in 2014, the new operation looks to add another two to four employees.

"To get off the ground, Farming Fungi received a $24,990 grant from the Maine Technology Institute, which it matched with $61,087 of private funds, to develop software and control systems to manage the mushrooms' environment and to trace lots of finished produce. The control system handles the sterile environment required to grow the organic culinary mushrooms by automatically controlling temperature, humidity and air flow. It also helps keeps the mushrooms free from pests and germs, and manage their growth or 'fruiting.' Additionally, the software keeps a database of raw materials, environmental conditions and other factors that affect a fungi's growth and allows the Sharoods to trace each mushroom lot from spore to market." [127]

While Maine retailers and restaurants are important markets, Robert sees Boston and other southern New England cities as significant markets. In addition, researching potential markets in Montreal and Quebec, he determined most fresh mushrooms are not from Canada and believes Canadians will buy **Mousam Valley Mushrooms**.

In the spring of 2014, conversations with **several Vermont foragers** of mushroom and other wild foods points to **potential interest to create year-round mushroom businesses.** With extensive forest resources across Northern New England, pioneering companies, and the SARE grant's "best practices manual," **the potential for new enterprises exists**.

In addition to utilizing Northern Forest resources for mushroom production, consideration of animal manure could be another growing medium. Kennett Square Pennsylvania is the "Mushroom Capital of the U.S." and the region's producers use well-composted horse manure to grow fungi. With the New England's growing number of horse farms, perhaps horse manure might factor into potential mushroom media.

126 bangordailynews.com/2012/12/31/business/maine-farmers-tap-technology-to-grow-organic-mushroom-business

127 "Mushroom business grows from new technology." *MaineBiz*. December 24 2012.

APPLES AND BEVERAGES

New England's reputation as an apple region extends back to the first English settlers. They brought apples, principally to make ciders, a fundamental beverage in rural colonial regions. Over time, both sweet and cider apples dominated the region and became a valuable commodity fruit crop. Until the middle of the 20th century, the area's growers sold eating apples across the eastern half of the country. However, the Pacific Northwest's larger apple orchards with less variable early spring weather, supplanted New England. Today, the Pacific Northwest grows 40% of the US crop; foreign imports of apples and juice concentrates undercut all US production.

As the region's producers struggled to compete with Northwestern and now Asian orchards to sell eating apples, some enterprising growers looked beyond fresh. Americans' desire for unblemished fruit translated into a handful of profitable varieties. The new entrepreneurs are looking to heritage and antique varieties for fresh eating apples and beverage production, and are also exploring value added approaches to leverage value from blemished product and "falls" (apples that fall from the tree and may not be sold as fresh).

This movement has been in part devised by growers as a strategy to minimize risk. Value added products do not require grade A, unblemished apples to sell for eating and thus more of the crop can be salvaged in any given year to optimize profitability. While varieties like McIntosh, Red and Yellow Delicious, or Granny Smith dominate the wholesale market and supermarket chains, many growers now choose older heirloom and antique eating and cider types. These varieties appeal to consumers, as well as cider makers. A similar situation exists for seasonal fresh pears; while fresh pears are still in demand, fermented beverages – traditional English Perry and wine – offer additional opportunities for value-added products.

Organic apples remain a small percentage of regional production, since organic control of native and non-native pests is difficult to achieve. The use of Integrated Pest Management practices helps some growers, but competition from cheap apples and apple products from outside the region continues to be the most important factor to financial success.

The new **outcomes offer exciting and profitable opportunities**. One direction uses apples to make sauce, butter, and other cooked condiments, as well as frozen pies and other desserts. In Maine, another approach links orchards, growing "small" apples for school lunches to the new standards for school lunches and increased interest in "farm-to-school" programs. Likewise, an opportunity may exist for a processing company to cut and package apples for lunch programs.

The third innovation is more of a renaissance – the **production of ciders from sweet too hard to ice**. In the fall, the smell and taste of sweet cider flavors the air in New England; historically, these ciders were made from a wide variety of sweet and tart eating apples. State and regional apples associations promoted orchards, apple varieties,

and cider. Over the past 15 years, orchards across New England, working with hard cider apples developed traditional English and French style ciders, often very suitable with food. Consumers value these ciders because they tend to have lower alcohol levels, are alternatives to craft beer, and gluten-free. An additional outcome is the emergence of traditional unpasteurized cider vinegars. Consumers view these fermented vinegars as ideal culinary additions with health benefits.

In the last five years, the **growth of the American craft cider community especially** across the Northern Tier is astounding. Cideries like pioneer Farnum Hill in West Lebanon NH; Vermont's Citizen Cider (Essex) and Flag Hill Farm (Vershire); and Maine's Kennebec (Winthrop) and Urban Farm Fermentory (Portland) are excellent examples. The explosion of consumer interest is reflected in the explosive growth of Woodchuck Hard Cider, by Vermont Hard Cider Company (VHCC) based in Middlebury VT who has been growing at a rate of 30% per year and controls 60% of the U.S. hard cider market, with annual sales of $32 million in 2011.[128] VHCC just completed a new production facility to keep up with demand. One can tell the category is hot when multi-national brands such as Anheuser Busch start launching offerings (Michelob Ultra Light Cider debuted in 2012 and Johnny Appleseed Hard Cider came out in April 2014).[129]

In 2013, the US Association of Cider Makers launched with organizational help from the American Cheese Society. The association reflects the rapid growth and early maturation of the cider community. However, a significant problem appeared over the past couple of years – a **shortage of appropriate apples for hard cider**.

Jonathan Frochtzwajg, writing for *Modern Farmer*, describes the situation and response:

> Trouble is, cider apples haven't kept pace with cider. Many of these fruits are heirloom varieties—distinctively flavored, colorfully named cultivars such as Kingston Black, Yarlington Mill, and Porter's Perfection — that went nearly extinct on American soil during Prohibition and haven't been cultivated on a large scale since.
>
> Given the economics of the apple market, it's unlikely that major growers will provide a solution anytime soon, says Jim Allen, the New York Apple Association's executive director.
>
> "You've got to remember: the lowest-valued apple is the apple that's crushed up and made into juice; the highest-valued apple is the apple that ends up at Trader Joe's," he says. "Nobody's planting apples to do anything but try to put them into that high-value category."
>
> With or without the big guys, though, a patchwork of cider-apple sources is coming together. Smaller-scale and more-nimble commercial growers are diversifying into cider varieties to hedge against crop failure.[130]

128 Keck, Nina. "**Hard Cider Demand Creates Need For Expansion**." VPR News. 6/14/2012

129 "Anheuser-Busch Entering Cider Market." *Fool.* March 24 2014. "New Michelob Ultralight Cider Hits Shelves Today." Anheuser-Busch.com

130 "**America's Hard Cider Boom Has One Problem: Not Enough Apples**." *Modern Farmer.* April 23, 2014

For New England apple orchards, orchardists, and nurseries, the shortage may provide an opportunity to diversify – to support a mix of eating and cider apples and by doing so, spread risk more broadly. However, developing orchards with sufficient annual yields takes time; whether using grafting techniques or cloned trees the plants require years to bear adequate fruit to support the burgeoning craft cider community. Two important risks result from the time needed. Can these new cideries manage with current supplies or must they use concentrates to build a business? Five or ten years out, will consumer interest in craft cider still exist? The authors cannot answer these questions, but want to illustrate the risks involved.

While hard cider bursts on the scene and wins new converts, **another bright opportunity comes from ice cider**. For centuries, Austrian and German wine makers produced ice wine, a dessert wine produced from grapes that freeze while still on the vine. While the water freezes, the sugars and other dissolved solids do not; when the frozen grapes are pressed, the more concentrated grape liquid yields a smaller amount of more concentrated, very sweet wine.[131] The results are complex, low alcohol, dessert wines. In the 1980s, ice wines appeared on Canada's Niagara Peninsula, most notably Inniskillin Winery, and sparked a new generation of North American ice wineries. Following these precedents, pioneering Quebec apple growers confronting the same market pressures and loss of business as New England apple growers, embarked on ice cider relying upon the region's variety of sweet apples and cold winter temperatures! The Quebecois discovered apples frozen on the tree concentrates the sugars and flavors and once pressed produces a rich, fermentable liquid, just like ice wine (there are also ice wine makers in Quebec as well).

Eden Ice Cider

Eden Ice Cider in West Charlestown VT led the Northern New England movement into ice cider production. From its debut in 2007, Vermont now counts seven cideries, four of which started as orchards. While the company grows some of its apples, it buys the majority from other orchards to produce its own branded ciders and private labels product for other producers. To understand the growth potential, Eleanor Leger, co-owner of Eden, described the company's growth:[132]

> **2007:** Company organized with first press in the fall.
>
> **2008:** Produced 100 cases (**1200 bottles**) of 375 ml bottles from 2007 press.
>
> **2009:** Hired an orchardist who works three days a week. He designed and cultivated Eden's biodynamic, organic orchard.

131 http://en.wikipedia.org/wiki/Ice_wine

132 Interview with Eleanor Leger. May 16 2014.

2010: Company first distributed into MA and NH

2012: Outgrowing their orchard's apple supply and on-farm facility, they received a grant for production and tasting center in Newport.

2013: They source apples from different orchards; press them onsite and transport the juice to Newport for fermentation, a process that takes months. In fall, 2014, they will fill **75,000 bottles**!

They can scale up production to **225,000 bottles** annually!

Currently, Vermont accounts for 25 – 30% of Eden's market with Chicago, New York State, and Massachusetts rounding out the bulk of their sales.

- Alberta Canada: they made a connection through a trade wine show and now sell to retailers in the province.
- October 2011: They attended NY Cider Week organized by **Glynwood Institute**. The event opened the door into the metropolitan market; among others Daniel Boulud's restaurants carry it.
- Senator Patrick Leahy's Taste Vermont event in Washington DC (a hugely popular annual event) opened doors to Maryland and District of Columbia.
- They have distribution into Chicago, Portland, Seattle, and have a West Coast distributor.
- In 2014, they expect to expand into Connecticut and New Jersey.

Challenges to the Company's Growth and Sustainability[133]

- Although the region has a climatic zone to produce dessert apples and ice cider, the market is limited: low customer awareness and demand (you can only drink so many ice ciders). Eden Ice Cider thinks climatic change in the region might match with appropriate terrain characteristics for other types of apples.
- The company needs apples; lack of cultivated orchards for cider production is a barrier. Other cideries own extensive orchards to supply apples, Eden buys apples from several Vermont orchards. The company does not plan to expand its own orchards. The Eden Ice Cider situation raises questions about similar companies' ability to locate appropriate apples at a price favorable to both farmer and producer. Each must find a reasonable economic return to make the equation work.

133 Interview with Eleanor Leger. May 16 2014.

- They need appropriate scaled apple presses that are efficient, fast, and do not damage the pulp. One possible **opportunity for future growth and investment** is to build a press located near an exit on I-91 with cold storage capacity to serve a number of orchards and cider makers.

- Many commercial cider producers such as Woodchuck and Angry Orchard (Samuel Adams) use apple juice concentrate, sometimes from foreign sources.

- Large commercial cideries have launched "craft" products, such as Woodchuck Hard Cider's recent release of "Farmhouse Select" available in 750 mL bottles made exclusively of Addison County VT apples. They expected to sell 3,600 750 ml bottles (713 gallons), but instead, sales came in 15 times higher, around 54,000 750 mL bottles.[134]

- Eleanor thinks the cider business will look eventually like the wine industry with a broad spectrum of company sizes, distribution networks, quality, and so forth.

- To an extent, the company is already driven by distribution market. Unlike Hall Home Farm on Grand Isle that sells direct to consumers (onsite and farmers markets), Eden works with distributors and wholesalers. Factoring in its costs of production, the company is already at the mercy of the system.

- Current state regulations are challenging and could be revised to support the growing cider, wine, and spirits communities without compromising public health and safety.

- Neither consumers nor trade partners are educated about hard and ice ciders.

134 Bullard, G. "Woodchuck Gets Back to Basics." WCAX.com. 11/7/2011.

FERMENTED BEVERAGES

Wineries/Grapes

From pioneering wineries like Snow Farm and Shelburne Vineyards, **wine-making in the Northern Tier is now a serious business.** While fruit wines and traditional European types are well-known, **new cold-hardy grapes varieties** that both **tolerate cold and make excellent wine** are planted **in Vermont, New Hampshire, and Maine.** Jerry Rodman in Litchfield ME developed some varieties ideally suited to Maine and other Northern New England states.[135]

Vermont wine now has a strong roots in the Vermont agriculture scene, evident by the number of viticulture classes popping up around the state. At Vermont Technical College, students and learners alike can now take classes that are a part of their Cold Climate Viticulture Series. Topics include:

- Grape Science: grape chemistry, harvesting, and basic wine processing
- Wine Science: basic wine chemistry, nutrition, stability, and analysis.
- Vineyard Operations: site selection, varietal selection, site preparation, planting, trellis construction, winter pruning, weed control, and cover crops.
- Vineyard Pest Management: pest and disease control, integrated pest management, and canopy management by cluster and shoot thinning.

This summer, the University of Vermont offered a summer class called Sustainable Orchard and Vineyard Management. Students learned the principals and practices of commercial orchard and vineyard crop production with such topics as:

- Site selection and preparation
- Cold hardiness development
- Varietal selection
- Tree and vine training and trellising systems

135 Interview with John Harker. February 5 2014

- Cold hardiness development
- Nutrient, water and pest management
- Harvest and post-harvest considerations.
- Environmental and economic sustainability of fruit production systems.

The **Vermont Wine School** teaches wine education individuals to expand their knowledge or enter the wine world as professionals.

"For those of us northerner's who never thought we'd see grapevines scattering our hilltops, this is an exciting time. And as a state leading the way in the production of specialty foods, we're excited to see growth in the Vermont wine industry."[136]

In 1985, two vineyard professionals from the Champagne region of France and four Quebecois in the hospitality industry founded Canada's premier vineyard, Cep D'argent on the shores of Little Lac Magog. Brothers François and Jean-Paul Scieurs' knowledge of viticulture and winemaking from Champagne made Le Cep d'Argent a great success. The winery and vineyard consists of 114 acres housing 65,000 vines, producing 125,000 bottles of wine per year. Cultivars are red: Marechal Foch de Chaunac, Frontenac, and Sainte Croix; white: Vidal and Seyval Blanc. For the champagne they use chardonnay and pinot noir.[137]

Distilled Spirits

Over the past ten to twelve years, the advent of new distilled spirits and cocktails revolutionized American drinking habits, created new generations of consumers, especially Millennials, and helped establish hundreds of innovative bars, taprooms, and restaurants. "Federal permit data show that just between 2008 and 2012, the number of craft distilleries more than doubled to 471."[138] This phenomenal growth from rural small towns to metropolitan areas, reflects important changes in Americans' palates away from high-alcohol California wine, mass-produced national brand beer, and bad coffee, for example, to sophisticated, even subtle beverages, including niche market coffee, cocktails, beer, and tea. The evolution, sometimes bordering on a revolution, means potential new opportunities for distilleries in the Northern Tier.

In New England, American Distilling Institute data for 2013 shows the following:

136 http://www.vermontwine.com/2014/03/viticulture-classes-come-to-vermont/
137 http://cepdargent.com/en
138 http://www.npr.org/blogs/thesalt/2014/01/22/264863748/small-batch-distilleries-ride-the-craft-liquor-wave

Table 10. America Distilling Institute Data, 2013

[139]

State	Population	ADI Distilleries	Distilleries per capita
Massachusetts	6,646,144	8	830,768
Rhode Island	1,050,292	2	525,146
Connecticut	3,590,347	1	3,590,347
Vermont	626,011	13	48,155
New Hampshire	1,320,718	4	1,320,718
Maine	1,329,192	6	221,532

Many of these distilleries use a variety of local raw materials – whey for vodka; barley; corn; maple sap and syrup as a flavoring or to ferment; apples; juniper berries – to create their spirits. Beyond the possibilities for new spirits businesses, a growing demand for local ingredients creates potential for regional farmers. For example:

- **Vermont Spirits Distilling Company**, located in Quechee, hand-picks juniper berries as part of its botanical recipe for Gin.
- **Dunc's Mill** in Barnet VT produces different rums, one of which uses maple syrup made from its sugarbush for flavor.
- **Caledonia Spirits** in Hardwick VT makes an Early Riser Corn Whiskey from grain grown by Jack Lazor, a well-known organic farmer in Westfield VT.
- **Sea Hagg Distillery** in North Hampton NH makes a variety of rums and when local fruit is available, fruit brandies and eau-de-vie.
- **Flag Hill Distillery** in Lee NH produces gin, vodka (made from NH apples), rum, and moonshine.
- **Maine Craft Distilling** in Portland manages its own malting and distilling onsite and uses a wide variety of Maine raw ingredients. They contract with a Fryeburg (Oxford County) farmer to grow barley. Its Chesuncook Botanical Spirit, made from carrots, is flavored with such herbs as locally-sourced juniper and mint, while Blueshine mixes wild Maine blueberries and maple syrup. In 2014 – 2015, the company expects to bottle 25,000 bottles with a 10% growth projection. They see real cache with spirits from Portland. Slow Money Maine helped connect them to investor capital.[140]

139 http://nedistilling.com/first-look-at-craft-distilleries-in-new-england/

140 Interview with Luke Davidson. Maine Craft Distillers. December 5 2013.

"This local movement is huge, I think," said Heather Hughes, co-owner of Sea Hagg Distillery in North Hampton. "There are a lot of people supporting local business, and I think if you make a quality product, they are going to keep coming back."

Flag Hill's [Heather] Houle also said she thinks that micro-distilled spirits have a fighting chance because of the nature of the generations out there shopping. She reasoned that baby boomers "have some spending money, and they are looking for things to buy and experience. So it's not even, 'let's go buy that craft beer from the store,' it's, 'let's go find that craft distillery and visit them.' And they have the money to make those trips."

And they aren't alone, she said. The Millennials – now in their 20s – are looking for adventure. "The Millennials will try anything. They don't care what public perception is. They don't care if someone says, 'Oh that's a New Hampshire wine or that's a New Hampshire spirit, it's not as good.' In fact, if somebody says that to them, they are more inclined to do the opposite. 'I'm going to do it my way, I'm going to explore.'"[141]

The authors recommend **NCIC consider the overlapping demand for grains, fermentable fruits, and flavorings that can drive new products and markets**. Working in partnership with the region's distillers, farmers, and grist mills, identify facility needs, desirable grain and fruit characteristics, and other collaborative opportunities. Clearly, the growth of distillation in New England, together with the craft beer community, argues for future potential. We recommend drawing upon the knowledge and expertise of these new entrepreneurs to help support new business development. At the same time, acknowledge and collaborate with nascent educational programs at several regional colleges.

A Vermont Public Radio broadcast examined a 2014 summer course on distilled spirits at Vermont Technical College and captured some of the recent changes in the craft distilling community:

> *Instructor Duncan Holaday founded Dunc's Mill, the oldest continuously operating distillery in the state. "I would call this a kind of master's course," said Holaday. "Some of the people are marketing people, others are distillers, engineers and farmers." Holaday has been making rum in Vermont for 14 years. At one point his was the only distillery in the state. Not anymore.*
>
> *"Now there are probably 16 distilleries," said Holaday. "So we've been watching growth and it's now what you might call a kind of boom. A time when many people are coming in and making remarkable products."*
>
> *The students looked at everything from the marketing of spirits, to the science of distilling using Vermont ingredients.*
>
> *David Thayer is from Hooker Mountain Farm in Cabot. He's taking the course to see what types of small-scale production might work for his farm. He's thinking whiskey. "The obvious thing would be doing a grain-based whiskey, because we have the grains," said Thayer. "But then a maple base*

141 **http://www.nhbr.com/July-26-2013/Micro-distilling-trend-makes-its-way-to-New-Hampshire/**

allows for flavor that would make it sort of regional, native to New England." Thayer has been selling maple sodas produced at the farm at the Montpelier farmer's market and is looking to branch out.[142]

In 2013, one of the authors developed a pro forma business plan/feasibility study for a craft distillery in the town of Groveton NH. Following is an excerpt from the study's executive summary, findings, and recommendations:

> A recent trend in value added food production has been the creation of craft distilleries across the country. There are now thirty-one distillers in New England alone and two national craft distilling associations. Products range from Moonshine to clear liquors, brown liquors, and fortified wines and liqueurs. Some producers are capitalizing on their "terroir," using locally sourced ingredients for their products, such as honey, potatoes, and grains, while others are simply noting they are using local water or not mentioning anything at all other than the story of why they got started. A 500 gallon still operation would be considered a medium sized craft distillery. This size of an operation could easily fit within a 10,000 square foot space. A 500 gallon still would yield about 120 gallons of 80 proof liquor per run. Assuming one run per day, five days per week, a 500 gallon still operation could yield 31,200 gallons of 80 proof liquor per year.
>
> In order to establish a presence in the marketplace and ensure a stronger financial footing, the operator would be wise to consider a diversified product line including both clear and brown liquor. Clear liquors, such as vodka, could benefit from claiming terroir of local base ingredients, such as potatoes, however, brown liquors, such as whiskey, command a significantly higher premium and attract more cache in the market place.
>
> The study revealed a distillery making clear spirits such as vodka would be financially challenged if it relies on locally sourced inputs. At full production of one run five days a week and retail sales at $19.99/750 ml ($12.27/750 ml to distiller after wholesaler and retailer mark ups), vodka would generate a negative cash flow of approximately $9,000 per year. If purchasing commodity "grain neutral spirits," the vodka generates a positive EBIDTA (earnings before interest, taxes, depreciation, and amortization) of approximately 6%.
>
> Producing a whiskey retailing for $34.99/750 ml ($21.49/750 ml to distiller after wholesaler and retailer mark ups), made from pre-purchased wholesale whiskey or scotch could yield an EBIDTA of 32%. Producing just whiskey might, therefore, seem most profitable; however, since the time required for aging impacts immediate cash flow this approach may not be feasible.
>
> Therefore, the study recommended a plan to make two products, a locally sourced ingredient clear liquor and a pre-purchased brown liquor to distill and age (such as Whistle Pig's strategy to buy top-grade Canadian whiskey to age and bottle in Vermont, while growing some of its ingredients on-site). The clear liquor could leverage the higher margin from the brown liquor to support

142 Annie Russell. "Course Highlights Vermont's Craft Distilling Boom." *VT Public Radio.* June 9 2014

it, while sourcing local ingredients to optimize market appeal. The clear liquor can generate immediate cash flow to support operating expenses while the brown, aged product would support long term profitability. The capital expense to renovate and equip a 10,000 square foot building to house a distillery is approximately $600,000."[143]

Craft Beer Renaissance

Of all the major changes in America's food landscape, none matches the explosive growth of the craft beer renaissance. By 1978, with the exception of Rhode Island's Narragansett Brewing Company (closed in 1981; re-opened 2005) and perhaps one other company, New England had no breweries left. Since then across New England and the country, a renaissance of craft beer production ensued, driven by entrepreneurs and home-brewers who transformed hobbies into businesses (federal legislation signed in 1978 allowing legal beer-making at home contributed to the expansion). "The 'Beer Revival' of the past 30 years is a phenomenon attributable to one of the first (if not the first) 'open-source' collaborative experiences in modern history. The community of homebrewers, beer enthusiasts and craft brewers [were] the pioneers of the democratization of process."[144]

From approximately 80 US breweries, large and small in 1978, today the number of operating breweries totals 2,822, with 2,768 of them considered craft (98 %). The number includes more than 400 new breweries opened for business in 2013. The number of breweries is the highest since the 1880s!

Today, New England counts at least 230 breweries, with Massachusetts (70), Maine (52), and Vermont (31) the highest totals, while the latter has the highest per capita number of breweries in the nation (Maine is fifth and New Hampshire is eleventh). In 1996, brothers Jason and Todd Alstrom founded *Beer Advocate* in Boston; today, it is a highly respected craft beer rating site. In January 2013, *RateBeer*, a consumer Website, ranked Hill Farmstead Brewery in Greensboro VT as the "best brewery in the world." On a Friday afternoon at Montpelier's Hunger Mountain Coop, the store sells more than 100 cases of The Alchemist's Heady Topper in less than an hour. Even in the winter at Hill Farmstead, customers wait in line in the snow to buy whatever the brewery has available.

Examples like these point dramatically to the potential economic benefit New England's breweries, pubs and taprooms could have on the local agricultural economy if they sourced ingredients locally. The grain section highlighted some of the potential opportunities for and challenges to Northern New England grains and hops. Up to this point with few exceptions, all of the region's breweries buy barley, wheat, other grains, and hops from outside sources.[145] If even only a small percentage of needed grains and hops came from the region, the economic impact would be significant. Finally, one distinct advantage in New England – access to adequate water resources.

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143 Business Planning Associates. Groveton Mill Site. A Study of Business Enterprises to Occupy the Mill Site. North Country Council. 2013

144 Charlie Papazian. "History of Beer: The Revival." **www.CraftBeer.com**

145 Jeff Baker. "What Does It Mean for a Beer to be Local?" *Burlington Free Press.* May 30 2014.

The accompanying chart depicts the existing, considerable (non-agricultural) economic value beer generates annually for the Northern Tier states. The authors recommend that NCIC work on cultivating relationships within the local craft beer supply chain (between growers and brewers, growers and malters, growers and technical assistance, malters and technical assistance, malters and brewers, etc.) to optimize the potential for local ingredients to be sourced on a more regular and frequent basis within the region's craft beer industry.

Table 11. Northern Tier Breweries, An Economic Powerhouse – 2012[146]

Maine	
Total Economic Impact:	**$873,586,400**
Industry-related jobs:	**10,370**
Total tax contribution:	**$191,844,700**
Brewers & Beer Wholesalers:	**58**
New Hampshire	
Total Economic Impact:	**$1,350,073,400**
Industry-related Jobs:	**10,320**
Total Tax Contribution:	**$301,765,100**
Brewers & Beer Wholesalers:	**34**
Vermont	
Total Economic Impact:	**$552,164,800**
Industry-related Jobs:	**6,130**
Total Tax Contribution:	**$117,260,900**
Brewers & Beer Wholesalers:	**35**

The authors recommend NCIC promote value of local ingredients, especially a wide array of flavor elements. As a result of the USDA Jobs Accelerator Grant, the agency is positioned strongly to connect farm and

146 **The Beer Institute**. 2012

forestry components to help expand the flavor characteristics found across the Northern Tier. Using such local ingredients make the following statement stronger:

Full-flavored, small batch beers are a gastronomic experience that help satisfy our need to take part in something truly special and support local businesses all at the same time—it's a meaningful pursuit. What feels good tastes even better, and this sentiment, coupled with the fact that craft beer comes from small and independent businesses making world class, fermented beverages truly sums up craft beer's success in 2013.

For example, add in that "...craft beer comes from small independent businesses **sourcing local ingredients** to make world class, fermented beverages.... "Any brand that can provide a meaningful bridge between our idealized identities and cultural reality will be a marketplace success. We all want a life that is remarkable, but only a rare few do not feel short changed at least at some level. We then use stories to overcome life's contradictions. We sort things out with parables from religion, folklore, the arts, pop culture, sports, politics, and, yes, consumer brands. In beer, craft is only currently the most poignant storyteller."[147]

Beer's Future Looks Bright

In the past decade, craft brewing nationwide averaged 9.3 percent annual growth, despite a challenged economy and tighter purse strings. To put it into perspective, nationally beer consumption declined at an average rate of 0.2 percent, mostly a result of the top 10 U.S. beer brands losing market share. This is a true sign of the cultural shift in the beer landscape.

A 2013 Technomic Inc. survey reveals:

- More than half of consumers (56%) agree that it is important for a restaurant or bar to offer a wide variety of craft beers
- 49 % say they will go to a particular establishment because of its craft beer selection.
- Flavor most important attribute of a craft beer according to 86% surveyed.
- Food was important to half of the consumers ordering craft beer (54 %) and was particularly important to Millennials (65%).

The authors reiterate, while the craft beer industry future appears bright and may continue to generate jobs and support the local economy, it will **impact local agriculture** only if:

1. Scientific research and technical support are essential to improve quality of local inputs.
2. Growers make use of technical assistance and developments in science and technology to improve their product. Vermont Technical College offered a summer 2014 brewing course; taught by Steve

147 Greg Owsley. Storied Brand. Published in *Beer Business Daily*.

Parkes, owner of Drop-In Brewery in Middlebury VT and the American Brewers Guild, an online program for aspiring brewers.

3. The region and industry work to broaden consumers' perception of value to appreciate "terroir," possibly through small batch, limited edition products. Even if local grains or hops are not of equivalent quality to commercially available alternatives (to a point), its uniqueness will be valued.

4. In addition to educating consumers, we must also attract brewers to experiment and promote local grains, hops, and flavor ingredients.

More fermentation!

As the previous examples illustrate, fermentation plays a significant role in new business development across the region. While most businesses focus on one product, the **Urban Farm Fermentory** in Portland ME counts several in its portfolio.

"Founded in March 2010 by entrepreneur Eli Cayer, a Mainer himself, the Urban Farm Fermentory (or UFF) is an experimental fermentation center. We source as many local ingredients as possible in an attempt to highlight and preserve Maine's unique terroir. Our array of fresh pressed Maine apple cider is spontaneously (or wild) fermented in a Farmhouse style until bone dry & tart. 'Spontaneous fermentation' utilizes naturally-occurring yeast in the air and on the fruit, which means even the yeast culture in our cider is local. Our potent, probiotic Kombucha (fermented tea), with its 1.5% ABV and tart, acidic bite, is one of the few true examples of the form left after the infamous kombucha crackdown of 2010."[148]

All UFF ciders depend directly upon local ingredients; here are a few examples:

- Dry Cidah – 6.8% ABV: 100% fresh pressed Maine apples and wild Maine yeast create different levels of funk depending on the batch. Arguably their definition of Maine terroir.
- Hopped Cidah – 6.8% ABV: dry cider conditioned with Cascade hops
- Sour Cidah – 5% ABV: a new cider with kombucha.
- Dickson Cidah – 6.8% ABV: dry cider hopped with fresh Maine cascade hops from the backyard of Great Lost Bear bar manager Mike Dickson.

148 **http://www.urbanfarmfermentory.com/**

- Buchanan – 6.8% ABV: a dry cider made from Maine Baldwin apples, an heirloom variety prized for its remarkable cider taste. Most of the New England Baldwin trees didn't survive the 1934 winter and were not re-planted. Named after David Buchanan, a friend of UFF who identified the Baldwin trees that were harvested to create this brew.

Eli took over a former taxi garage in the East Bayside area of Portland, a mixed light industrial zone with rail yards. Company has access to four spaces:

- One bay is a multi-purpose hub to house food companies that complement UFF and offer classes spanning the fermentation spectrum. Future plans include three commercial kitchens rentable by the hour for aspiring entrepreneurs. They want to spark innovation and collaboration to make products that promote economic growth in the East Bayside neighborhood and Maine. Currently, they open part of this space for music, theatre and other art programs.

  During winter 2013 – 2014, they housed the Saturday Portland Farmers market; a brilliant use of space and simple way to showcase UFF and tenants.

  Current tenants include Bomb Diggity Bakery; Pure Pops frozen popsicles and the Maine Pie Line frozen pies, both of use Maine fruit; and Swallowtail Farm Creamery & Apothecary.

- Bay 2 is the tasting room. They are building a greenhouse so visitors to view plants used in UFF products.

- Bay 3 house the cider and mead production area, where they can ferment up to 2,000 gallons at a time in primary and secondary fermenters. The bay includes space to handle bourbon barrel aging and limited or experimental brews.

- Bay 4, the original unit, is dedicated to kombucha brewing and packaging.

UFF beverages are distributed throughout the state and some into Massachusetts by Pine State Beverage Company.

Beyond Urban Farm Fermentory, the East Bayside neighborhood now boasts several food businesses: Bunker and Rising Tide Brewing companies with Oxbow Brewery considering warehouse space; Tandem Coffee Roasters and Coffee by Design; and Maine Craft Distillery. Since the arrival of these companies the area has changed; no longer do buildings look shabby and abandoned and the increase in traffic reflects a vibrancy. Land and building owners realize the built environment offers relatively inexpensive production space... and rents appear to be increasing.

BERRIES

Elderberries, blueberries, cranberries, raspberries, and strawberries

Market for fresh, frozen, and processed berries is strong. A wide array of value-added options exist from jams and jellies to natural sodas, fruit wines, and flavors for fermented and distilled beverages.

Barriers/Opportunities:

Major concerns focus on pests – a new Asian variety of fruit fly threatens native blueberries – and climate change. Advanced and expanded processing and storage capacity are needed. Also, again, producers are using strategies of turning the berries into value added products such as wine as a tool for continuing to salvage income from the crop even if they are unsalable for eating out of hand.[149]

149 Wilson R., *Keep Growing Pilot Study Preliminary Report.* 2013

PRODUCE

New England consumers eat increasingly large amount of fresh, locally-grown produce. Whether at farmers markets, coops and specialty stores, small grocery chains, and large supermarkets, fresh produce sells. While the greatest challenge is for out-of-season vegetables, we see expanded use of high-tunnel cultivation for produce to extend the season in both directions. Farms in Vermont, New Hampshire, Maine, and Quebec grow fresh vegetables year-round using hoop houses and hydroponic production. At the same time, New England receives abundant precipitation, ideal for pastures and growing a variety fruits and vegetables. Across the region, different research projects are ongoing investigating the intersection between climate, farming, and soil.

Barriers/Opportunities

Certain population centers in Vermont, New Hampshire, and Maine can support full time income for direct to consumer produce growers. In general, however, this is not easily accomplished in the Northern Tier. Another more logistically feasible avenue would be to grow larger volume crops for wholesale markets. However, even this option may be limited. According to Anthony Mirisciotta, Executive Director for **Deep Root Organic Coop**, a certified organic grower cooperative in Northern Vermont and Southern Quebec, the market for "summer vegetables" at the wholesale level is saturated. The key opportunity he sees for northern growers is the opening in the market for root vegetables and winter storage crops. "There is a 'storage crop void.' It is mind blowing what kind of [volume] they [wholesale buyers] go through." Deep Root quantified the opportunity as an additional two million dollars in gross sales of root vegetable if it had access to product. Currently, Deep Root grosses $3 million in sales, growing at 40% per year and expects to be at $5 million in sales in two years, all from a surge in storage crops. Historically Deep Root's Vermont farm members have focused on greens and early product, while mid-season crops came from both Quebec and Vermont. Quebec farms tend to grow most of the storage crops.

Another strategy some producers are exploring is frozen product as a way to extend and create demand and generate year round sales. With less fresh product available in winter, the ability for local residents to buy local product diminishes. Frozen local produce preserved at the peak of freshness can make a welcome alternative to otherwise non-local vegetables or root crops in the winter months. To create frozen product, farmers need processing and storage capacity.

We identified a parallel issue to the meat industry with these questions:

- How far is it feasible for producers to travel to process produce before it makes the end product price prohibitive to the consumer?

- How far are producers willing to travel to utilize available infrastructure?
- Is the level of demand for such a facility financially feasible itself?

To illustrate this point, NCIC conducted a feasibility study on shared use storage in the Northeast. 61% of growers said they were interested and of that group only two thirds could agree on a site. **At this volume of usage, based on rates users were willing to pay, the facility projected an annual operating deficit of just under $16,000 per year.** While different demand and profitability outcomes exist for a processing facility, the research demonstrates location and financial feasibility of the service are essential to explore. In addition, the location and service fees impact directly the feasibility of growers to make use of the services. The Vermont Food Venture Center in Hardwick VT offers leasing of processing and freezing infrastructure to growers, and has clients from all across VT, NH, and ME.

The Farm to Freezer Project offer another example of the challenges to make long term sustainable progress in the local food system. In this case even with cooperative, active retail, distribution, processing and producer participation, the launch of a local, frozen vegetable line could not be maintained beyond the two year grant period.

http://nfca.Coop/farmtofreezer

The Vermont Food Venture Center, Neighboring Food Co-op Association, and Sunrise Orchards along with a variety of producers worked together to source, process, distribute and retail frozen local vegetables. Despite a lineup of local vegetables processed at their peak for year round consumption, (see picture below) the project was discontinued.

The reasons cited were as follows: "Conducted between 2011 and 2013, the project enabled us to learn a great deal about the realities of developing stronger regional food systems. Based on this learning, the NFCA and its partners decided to discontinue the program while we focus on some of the key obstacles to its long-term success. Our hope is that as we begin to address some of these challenges, we will be able to expand our efforts in the future."[150]

Hydroponics

While aquaponics offers the benefit of dual income, hydroponics can be a profitable endeavor on its own. Several examples of hydroponic operations in the Northeast exist, including Vermont Hydroponics (Florence), Green Mountain Harvest (Waitsfield), and Backyard Farms (Madison ME) and the many hydroponic growers for Quebec's "Taste of the North" brand. Hydroponics operations on the whole, however, are labor intensive

150 **http://nfca.Coop/farmtofreezer**

and challenging to run profitably in the Northeast with high energy and lighting costs in the winter and potential for blights, pests, and infestations to devastate crop yields. They are also capital intensive with significant costs for startup, infrastructure, and technical expertise. Efforts in Vermont and Maine are too new to have yet demonstrated long term success and profitability.

Specific Vegetable Business Data and Opportunities

Deep Root Organic Coop

If Vermont farms want to capitalize on a growth opportunity, they need to **cultivate more storage crops**. According to Anthony Mirisciotta, all Deep Root members are about the same size with similar capabilities, soils, and climate. Demand for summer product (like lettuce, tomatoes, etc.) is "topped out." The main difference between Quebec and Vermont growers and why the Quebec ones have year round cash flow is because they optimize their assets and have more of a drive to produce more storage crops. Americans vegetable growers appear to tend to want the winters off. The Quebec growers visit their Vermont counterparts and are amazed to see empty barns in the winter. Vermont farms could capitalize on their barns and land base to grow and store more root crops and participate in Deep Root's growth.

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Vermont Food Venture Center Institutional Vegetable Aggregator Opportunity

Vermont Food Venture Center started an initiative to coordinate growers with institutions to sell lightly processed carrots, broccoli, and potatoes at a scale of 2,000lbs of product per production day. The center has a maximum capacity of 6000 production hours per year at 5 days per week. The pilot seeks to have 20 schools participate. The goal is to work with smaller growers who need more market opportunities.

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Blue Ribbon Farm and Pasta Fresca: a collaborative recipe

From sheep to produce to pasta, Bob and Mary Burr in Mercer ME created a long creative history of entrepreneurship. Bob grew up in Maine and was a senior executive at Pride Manufacturing in Burnham, the world's largest producer of golf tees, while Mary is Australian. In 1976, the couple began farming "with a mutual passion for agriculture and growing our own food." They grew hay and raised Dorset sheep for lamb and wool from 1976 to 2011; descendants of their noteworthy flock are found across the United States. Their interests "changed in recent years with the development of the pasta business and the expansion of fresh vegetables."[151]

In 1994, they bought Blue Ribbon Farm and started vegetable production. They grow produce 10 months of the year and sell throughout the entire year. Influenced by Elliot Coleman, the Burrs followed his research and practice of growing vegetables year round under winter conditions. In 2008, they built the first greenhouse and it did so well, they added another one two years later, more than doubling production. In an adjacent processing shed, they wash, box, and chill the vegetables. "Late October and November see the high-tunnel greenhouses planted to winter crops which allow for harvesting throughout the winter months. Planting begins again [in] mid-February as the length of the day exceeds 10 hours of sunlight. By early March, the first of the year's vegetables are again ready for harvest."[152]

A few years ago, after a trip to Italy, the Burrs decided to start another new business. With no experience but their knowledge of good food and excellent palates, Mary and Bob learned how to make fresh pasta (not frozen!) from reading books. They secured private equity funds and purchased Italian equipment. The company's flour comes from two Maine mills, Somerset (Skowhegan) and Aurora (Linneus), while the wheat is sourced from Aroostook County ME and the Midwest. Using their eggs and vegetables, they make for pastas in 22 different shapes and several varieties of ravioli, including lamb sausage and pear and pecorino. Every week, they buy 20 – 30 pounds of ricotta (Jersey cows) comes from Crooked Face Creamery (Skowhegan) and chèvre from Kennebec Cheesery (Sydney).[153]

The demand for Pasta Fresca products is reflected in a steady expansion of production:

2011: 50 – 60 lbs./week; 2012: 100 – 150 lbs./week;
2013: 150 – 300 lbs./week

They employ three full-time and three part-time workers; in the summer, part-timers work 3 days/

151 http://www.blueribbonfarm.net/

152 http://www.blueribbonfarm.net

153 Interview with Mary Burr. November 20 2013.

week, while in the winter, 1 – 2 days/week. They sell direct at the farm; farmers markets in Skowhegan, Waterville, and Brunswick; and a group of seven to ten small retailers between Farmington, Skowhegan, and Waterville. Luce's Meats in North Anson, functioning as a common carrier, transports the pasta as far south as Freeport and Portland (Rosemont Markets). Linda Bean's Maine Kitchen in Freeport sells 300 – 400 pounds/week. Because of the success of Pasta Fresca, the Burrs are considering additional production of dried pastas, and developing a line of pesto derived from local ingredients.

In the authors' opinion, Blue Ribbon Farm and Pasta Fresca demonstrate potential opportunities for Northern Tier businesses. Despite Central Maine's cold winter temperatures (Skowhegan averages 14° in December; 4° in January; 8° in February and 18° in March), the Burrs grow vegetables during ten months and sell throughout the year. The successful vegetable business supported the development of pasta production. Their ability to source local flour, cheese, meat, and other ingredients contributed to strong local place-based image and visibility and excellent tasting, quality products. The collaboration with nearby farmers and producers, together with one company as the common carrier, helped increase everyone's revenue, and the local Skowhegan economy, while strengthening social and cultural community connections. These innovations took years to build as the steps were incremental; at the same time, the Burrs success required vision, hard work, investment capital, and a community network of colleagues and friends.

INSTITUTIONAL BUYERS

As consumers demand local food, institutions are also taking note. At Bates College in Lewiston, Maine, the study discovered the college buys 32% its food from 30 Maine farms. In 2010 Dartmouth College in Hanover NH spent 4% of its budget on local food (defined by Dartmouth as food produced within 50 miles of the College) from 27 different producers ($275,000-300,000 out of a $6.5 million budget).[154] In March 2012 the University of Vermont became the first school east of the Mississippi and just the fifth school in the nation to sign the Real Food Challenge, a commitment to serve 20% "Real" food by 2020. Real food, according to the Challenge, is food that "truly nourishes producers, consumers, communities and the earth." For the purposes of categorization, if local (within 150 miles or within the state of VT), humane (free-range, cage-free), ecologically sound (organic, sustainably harvested) or fair (Fair Trade), the food is considered "Real" and even better if it hits two categories. Today UVM is at about 12% "Real" food with about 8% being local from about 40 producers.[155]

In 2010, Fletcher Allen Hospital in Burlington VT, an early adopter of the Healthcare Without Harm pledge initiative, spent $1.5 million of its annual food budget of $3.5 million (43%) on products made in Vermont.[156] As of March 2013, 437 hospitals, health systems, long-term care facilities, and hospital food service contractors across the country had signed the Healthy Food in Health Care Pledge, to demonstrate leadership and send an important signal to the marketplace. These health programs are committed to their interest in local, nutritious, sustainable food and modeling healthy food practices for patients, staff, and visitors.[157]

Institutional buyers continue to represent a significant opportunity for local food sales. However, of particular concern is price, quality, quantity, and timely deliveries, and health and food safety protocols and assurances. Both farmers and buyers need education and mutual understanding.

154 http://www.greenreportcard.org/report-card-2010/schools/dartmouth-college/surveys/dining-survey.html
155 http://uds.uvm.edu/social.html
156 http://www.fletcherallen.org/about/news_room/press_releases/fletcher_allen_wins_national_awards_for_sustainable_food_lea.html
157 https://noharm-uscanada.org/documents/menu-change-2013-program-report-highlights-awards-and-survey-results

AGGREGATION AND FOOD HUBS

Everyone from growers to wholesalers, retailers, and restaurants emphasize an essential need for expanded aggregation facilities, transportation, and distribution networks especially in the North Country. The Interstate system helps somewhat in Vermont's Northeast Kingdom and Grafton and the west side of Carroll counties in New Hampshire. Maine's Franklin and Oxford Counties are served east – west by US Route 2; however, to move products south, growers and processors must connect to Interstate 95 in Augusta, Auburn/Lewiston or Waterville.

Although outside the immediate study area, the Auburn – Lewiston region has important advantages for Franklin, Oxford, Androscoggin, and Kennebec Counties: a large regional airport; direct access to I-95; an Intermodal Freight Transfer Facility in Auburn; and labor force. To benefit fully from the Auburn – Lewiston advantages, the region needs an aggregation center, rather than processing center. They see great opportunities for aggregating mixed loads to transport to places like Boston.[158]

Feedback from Maine interviewees emphasizes an overall need for increased processing capacity for vegetables — mostly for flash-frozen varieties — with major caveats about embarking on a regional facility. In addition, one purpose of food hub incubators is to help new businesses get started without the necessary major capital investments. Once a new business moves out, the food hub must attract a replacement. Recent experiences with several food and product aggregators or processors raise significant questions about the efficacy of these operations:

- Atlantic Hops in Maine, a failed effort to aggregate, market, and distribute local hops
- Micropak, a failed Burlington VT food hub and rental space food processing center
- According to Ellen Kahler, of the Vermont Sustainable Jobs Fund, of 22 food hubs started recently in Vermont, 6 had closed by fall 2013
- Precarious financial footing of the Vermont Food Venture Center
- Mad River Food Hub (only 4,000 sq. ft.) wrestles with financial challenges (see detailed story below)
- Maine Harvest Company (Topsham), after several years searching for financial support, has not completed its funding package and remains a vision.
- After a two year trial period the buyers, suppliers, and processors decided to discontinue the Farm to Freezer pilot project once initial grant funding ceased.
- In 2014, Coastal Farms and Foods in Belfast ME closed (see detailed story below)

158 Interview with Orman Whitcomb, USDA Rural Development. September 11 2013

Of the many efforts to launch a successful food hub, the **Mad River Food Hub** in Waitsfield VT demonstrates the potential successes and challenges for new businesses. In 2011, Robin Morris established a 4,000 square foot shared-use facility that offers USDA and State of Vermont inspected food processing and business incubator services. The company just hired its first general manager to oversee the four core services to farmer and food entrepreneur clients:

- Shared work space for multiple food processors, along with the scheduling and logistic support needed to share that space efficiently.
- Dry, refrigerated, and freezer storage for a range of users.
- Transport of products to a variety of area retailers.
- Technical and business assistance.

Today the company has eighteen producers and processors:

1. Kingsbury Market Garden
2. Lawson's Finest
3. Knoll Farm
4. Gaylord Farm
5. Joe's CSA
6. Vermont Raw Pet Food
7. Vermont Bean Crafters
8. Tamarack VT Sheep Farm
9. Screamin' Ridge Farm
10. Starbird Fish Company
11. Rookies Root Beer
12. Tonewood Maple
13. Vermont Salumi
14. Applecheek Farm
15. Artisan Meats of Vermont
16. New Village Farm
17. Mad River Distillers
18. Green Mountain Harvest

Mad River contributed significant support to Screamin' Ridge Farm, owned by Joe Buley, a trained chef and now a full-time farmer. He started farming part-time and gradually expanded his fresh produce offerings by adding a small variety of prepared foods and a CSA. Over time, with new hoop houses and additional processed products, like soups and sauces, he needed access to an inspected facility. The opportunity to work at the hub enabled

expansion, while creating new markets through federal and state inspection. To say the least, through the farm's collaboration with the food hub, Screamin' Ridge is ready for its next growth phase.

In 2014, Vermont's Working Lands Enterprise Initiative awarded $50,000 to Screamin' Ridge Farm to expand its operation. Matched by the farm's $75,000 investment, the plans are "to rent space for a USDA-inspected commercial kitchen to be shared via sublease arrangements with Vermont Bean Crafters and Blackwell Roots Farm. By the conservatively estimated new facility move-in date of October 2015, Screamin' Ridge Farm and Bean Crafters will have been utilizing the Mad River Food Hub incubator for 3 years each. Both businesses have benefitted enormously from this experience and are growing rapidly. If this growth rate is sustained, the next-stage value-added production, catering, storage, and distribution facility we are planning will be adequate for 3–5 years for all businesses."[159]

Coastal Farms and Foods

Perhaps the most dramatic and worrisome example is Coastal Farms and Foods in Belfast ME, viewed as an innovator with considerable promise.[160] The company launched in 2012 with more than $2,000,000 in investment funding and closed within two years, in April 2014. As reported by the *Bangor Daily News*, Jan Anderson, co-owner of Coastal Farms and Foods said

"... Her creditor will take possession of the facility shortly, and that as of this week, the electricity will be disconnected on April 22. The problem, Anderson said, is that for two years in a row, the blueberry freezing portion of the business — a major part of the new operation's business plan — failed. 'For two years running, we showed such a loss,' she said. 'It was hard for our creditor and our investors to overcome that. We have projections for the coming years that looked really good — the past is what hurt us.'

The 50,000-square-foot business, located in the former Moss Inc. manufacturing facility, was incorporated in 2011, and had raised $2 million in private investment and financing by the following year. Company officials told the *Bangor Daily News* in 2013 that the space could easily fit 100 producers. Anderson said Friday it currently is home to 15 food processors, including makers of ice cream, soda, dilly beans and blueberry vinaigrette. Additionally, nearly 50 farmers use its cooler storage, she said.

160 "Organic Candy Bar Maker Relocating to Rockland." *Bangor Daily News*. December 10 2013.

159 Capital and Infrastructure Investments; 2014. **http://workinglands.vermont.gov/projects**

But Cheryl Wixson of Cheryl Wixson's Kitchen said that the only primary recent tenants have been her prepared food business and Jeff Wolovitz of Heiwa Tofu. She said Friday morning that she'd been notified just 15 minutes earlier that she would have to move all her products and equipment out of the space by April 21.

'The facility is a very large facility. It's a beautiful facility. It's just too large,' she said. 'You don't build a church for Easter Sunday.' Wixson said that, fortunately, her company's schedule of taking the summer harvest and using it over the winter months to make products including fruit ketchups, marinara sauce and much more means that this was the last production week of the year.

'We're not shutting down, folks,' she emphasized. 'We have all the product made. We have all summer to enjoy it ... we have a really good business model. We have a viable business. We just have one small problem: We don't have a home.' Wixson said that in contrast to Coastal Farms and Foods Inc., her company had the opportunity to make its early mistakes on a small scale."[161]

161 "Coastal Farms and Foods in Belfast to Shut its Doors." *Bangor Daily News*. April 11 2014.

Financial Viability

A recent feasibility study for a 30,000 sq. ft. mixed use, commercial tenant building in NH found the facility would require a 40% occupancy rate (12,000 sq. ft.) to break even.

In 2014 the NCIC conducted a feasibility study on a leased vegetable storage facility. The study found approximately 61% of commercial growers would be interested in shared use storage if it convenient to them and affordable. Of these 61% agreed upon a location. Producers suggested $5 per pallet per month as a fair fee for the service and any given location would likely secure an average of 88 leased pallets. At this rate, the operation would generate $2,200 per year in gross income, yet costs to operate the facility would run approximately $17,969 per year, a net annual operating deficit of $15,769. The cost to build new or retrofit an existing space to meet the needs of a seasonal root vegetable storage facility are projected to average $54 per square foot.

While operating a shared use storage facility may not be viable as a commercial endeavor such a service might appeal to a public-private partnership since 61% of producers cited the benefits of this type of infrastructure to support the growth of the agricultural sector. Since the need is seasonal and part-time, the cold storage service could be absorbed into an existing business or organization. A merger can offset some of the overhead and operating expenses by cost-sharing expenses and assets with pre-existing programs.[162]

162 Wilson, R. *Feasibility Study for a Leased Vegetable Storage Facility.* NCIC. 2014

At this time, the authors **do not recommend NCIC proceed with a processing facility**, especially a regional one. While unlikely to be commercially feasible as an enterprise itself, a food hub with various services including storage and freezing, may be a potential opportunity for private-public partnership to support the growth of agricultural industry in the region. If public-private partnerships organize and implement food hubs or shared storage facilities, the following key elements should be addressed during planning:

- An entity is likely a small, underfunded nonprofit, and often times these organizations lack the ability to attract strong management.
- A plan to attract and retain top quality management is critical.
- Strong management will be critical to the success of the project given that the facility will likely operate with a negative cash flow from the start and is unlikely to secure 40% tenant occupancy.
- Management needs to create an active plan for initial capitalization, on-going fundraising, and long term cash flow. The partnership must know how the deficit be funded.

APPENDIX I

Individual interviews

1. Joel Alex: owner, Blue Ox Malt House. Skowhegan ME
2. Roger Allbee: former Vermont Secretary of Agriculture. Townshend, VT
3. Charlene Andersen: program officer, NH Community Loan Fund. Concord NH
4. Gary Anderson: professor, University of Maine Cooperative Extension. Orono ME
5. Nick Bartlett: owner, The Local Hub. Bethel ME
6. Henrietta Beaufait. Maine Department of Agriculture. Augusta ME
7. Jan Behnay. USDA FSIS
8. Lila Bennett and Dave Robb: owners, Tangletown Farm. Glover VT
9. Andrew Barton: professor, U. Maine Farmington (UMF) ME
10. Rebecca Brown: executive director, Ammonuoosuc Conservation Trust. Sugar Hill NH
11. Sean Buchanan: business development manager, Black River Meats. Springfield VT
12. Charlie Burke: president, Farm to Restaurant Connection. Sanbornton NH
13. Jaclyn Bursky: owner, Bursky's Custom Butchering. Plainfield VT
14. Mary and Bob Burt: owners Pasta Fresca. Mercer ME
15. Bob Butterfield: general manager, Spring Hill Angus. Orleans VT
16. Louise Calderwood: owner, Everything Agriculture. Craftsbury VT
17. Chris Callahan: agricultural engineer, UVM Extension. Rutland VT
18. Reg Chaput: co-owner, Chaput Family Farms. North Troy VT
19. Amanda Charland: sustainability coordinator, Co-op Food Stores. Hanover NH
20. Donna Coffin: More Maine Meat, U Maine Piscataquis County Extension Educator
21. Pete Colman: owner Vermont Salumi. Plainfield VT
22. Paula Day: chair,Heart of Maine RC&D Area Inc. Starks ME
23. Adam Dantzscher: owner, Renewable Energy Resources. VT
24. Luke Davidson: partner, Maine Craft Distilling. Portland ME
25. Larry Davis: USDA FSIS. Philadelphia PA
26. Shelley Doak: executive director, ME Food Processors and Grocers Association. Augusta
27. Jessie Dowling: owner, Fuzzy Udder Creamery. Whitefield ME
28. Grace Eason: professor of environmental and science education. UM Farmington ME

29. John Farr: owner, Farr's Tree Service & co-owner Green Mountain Harvest. VT
30. Cheryl King Fischer: ED, New England Grassroots Environmental Fund. Montpelier VT
31. Laini Fondiller: owner, Lazy Lady Farm. Westfield VT
32. Karen Freudenberger: director, VT Goat Collaborative. Burlington VT
33. David Fuller: expert, Agriculture & Non-Timber Forest Products. UM Farmington ME
34. Randy George: co-owner Red Hen Baking Company. Middlesex VT
35. Jim Gerritsen: owner, Wood Prairie Farm. Bridgewater ME
36. Phil Brown: owner, Vermont Rabbitry. Glover VT
37. John Hamilton: program officer, NH Community Loan Fund. Concord NH
38. John Harker: Maine Department of Agriculture. Augusta ME
39. Gail McWilliams Jellie: NH Department of Agriculture. Concord NH
40. Pete Johnson: owner, Pete's Greens. Craftsbury VT
41. Lee Kane: Eco-forager, Whole Foods Markets.
42. Lucas Kellett: professor and sustainability coordinator, UM Farmington ME
43. Tom Kelly: director, Office of Sustainability, U. of New Hampshire
44. Kelly LaCasse: food service director, Goodwill-Hinckley School; co-owner The Maine Meal. Skowhegan ME
45. Chuck Lacy: chairman and founder, Hardwick Beef. VT
46. Amber Lambke: president. Maine Grains & Somerset Grist Mill. Skowhegan ME
47. Mark Lapping: professor, University of Southern Maine. Portland ME
48. Eleanor and Albert Leger: owners, Eden Ice Cider. Newport VT
49. Michel Lemieux: co-owner Newport Natural Market & Café; Brown Dog Bistro and Butcher Shop; Manager Newport Tasting Center. Newport VT
50. Britt Lundgren: director organic/sustainable AG, Stonyfield Yogurt. Londonderry NH
51. Rachelle Lyons: coordinator, Center for Rural Partnerships. Plymouth State Univ. NH
52. Virginia Manuel: state director, USDA Rural Development. ME
53. Allen Matthews: coordinator of The Shiitake Mushroom Project. Pittsburgh PA
54. Samuel May: co-chair, Slow Money Maine. Portland ME
55. Andrew Mefferd: field supervisor, Johnny's Seeds. Albion ME
56. Ann Mefferd: co-owner One Drop Farm. Skowhegan ME
57. Anthony Mirisciotta. Executive Director, Deep Root Organic Cooperative
58. Julie Moran: manager, North Country Farmers Cooperative. NH
59. Cathe Morrill: president, Maine Food Processors Association. Rockport ME
60. Ken Morse: coordinator, Maine Network of Community Food Councils. Norway ME

61. John Naylor: co-owner, Rosemont Markets. Portland ME
62. John Nicholson: New England meat coordinator, Whole Foods Market
63. David Ordway: vice president, Pineland Farms Natural Meats. New Gloucester ME
64. Suzanne Podheizer: owner, Salt Café. Montpelier VT
65. Martha Putnam: owner, Farm Fresh Connect. Freeport ME
66. Jay Phinizy: director, New Hampshire Farm Services Agency
67. Ned Porter: former Maine deputy secretary of agriculture. Brunswick ME
68. Randy Quenneville: Meat Programs Chief. VT Agency of Agriculture. Montpelier VT
69. Jamien Richardson: owner, Cyon Business Solutions & former Maine Harvest Company. Topsham ME
70. Shirley Richardson: founder, Vermont Chevon. Danville, VT
71. Michael Rozyne: founder, Red Tomato. Plainville MA
72. Annie Rowell: program associate, Vermont Food Venture Center. Hardwick VT
73. Mike Roffman: former owner, Atlantic Hops. Larchmont NY
74. Bonnie Rukin: co-chair, Slow Money Maine
75. Joe Short: NCIC forest project leader, Northern Forest Center. Concord NH
76. Amy Scott: coordinator, Bethel Area Food Systems Council. ME
77. Sarah Scott: co-owner, The Pick Up. Skowhegan ME
78. Robert Sharood: owner, Farming Fungi LLC. Sanford ME
79. Shane Smith: manager, Concord Food Coop. Concord NH
80. Tanya Swain: ED, Western Mountains Alliance. Farmington ME
81. Arion Thiboumery: Lorentz Meats. Cannon Falls MN
82. Bob Thompson: ED, Androscoggin Valley Council of Governments. Auburn ME
83. Daniel Wallace: program developer, sustainable agriculture, CEI. Wiscasset ME
84. Jim Wilfong: former Maine State legislator. Stow ME
85. Orman Whitcomb: USDA Rural Development; Lewiston ME
86. Sarah Waring: ED, Vermont Food Venture Center. Hardwick VT
87. Anna Wolfe: Gourmet Retailer Magazine. Portland ME

APPENDIX II

Examples of Technical Assistance Resources

Following is a sample of resources available in the region that could support NCIC efforts. We discovered areas of production for which no technical support exists and other areas where more technical support is available and **should be researched and added to the list. We recommend NCIC** discuss with various service providers about how to coordinate funding, accessibility, and delivery of support to producers. Equally important, NCIC can explore how to provide support for technical areas with no or little known technical assistance resources.

Rice

Ecological Rice Farming in the Northeastern USA
http://www.ricenortheasternus.org/

Maple

- **Proctor Maple Research** Center at the University of Vermont.
  http://www.uvm.edu/~pmrc/
- **IMSI International Maple Grading School**
- **extension.umaine.edu/maple-grading-school**

Grain/Oil Seed/Hops

Northern Grain Growers Association

http://northerngraingrowers.org/growers
The Northern Grain Growers Association is a "farm grown" organization. Since 2004 many of the grain growers in Vermont have been gathering together for exchanging ideas, networking, and camaraderie. The initial focus of the group was to enhance organic seed saving, plant breeding, and variety improvement. Over time the group has developed a somewhat broader focus which includes all aspects of grain production. In recent years the interest in local grains has been increasing and the group now includes bakers, local eating enthusiasts, agricultural support personnel, and many beginning farmers.

Grain Testing Lab

http://www.uvm.edu/extension/cropsoil/cereal-grain-testing-lab

Northern New England Local Bread Wheat

http://umaine.edu/localwheat/

Maine Grain Alliance/The Kneading Conference

http://kneadingconference.com/

Extension Service

- **University of Vermont Extension.** http://www.uvm.edu/extension/cropsoil/grains
- **UVM Extension for hops.** http://blog.uvm.edu/hoppenin
- **University of New Hampshire Extension.** http://extension.unh.edu/Agriculture/Field-and-Forage-Crops
- **University of Maine Extension.** http://umaine.edu/grains-oilseeds/

Northeast Hop Alliance

http://nehopalliance.org/

Proteins

Beef Quality Assurance

http://www.bqa.org/

Beef Quality Assurance is a national program that provides guidelines for beef cattle production. It raises consumer confidence through proper management techniques and a commitment to quality within every segment of the beef industry. Producers embraced Beef Quality Assurance because it is the right thing to do and gained through increased profitability. As an education program, it helps producers identify and improve management processes.

Global Animal Partnership

http://www.globalanimalpartnership.org/

Global Animal Partnership, a nonprofit charitable organization founded in 2008, brings together farmers, scientists, ranchers, retailers, and animal advocates—a diverse group with the common goal of wanting to improve the welfare of animals in agriculture. Our signature program, **the 5-Step Animal Welfare Rating Standards**, recognizes and rewards producers for their welfare practices, promotes and facilitates continuous improvement, and better informs consumers about the production systems they choose to support. As of October 31, 2013, the 5-Step program includes 2,405 operations, raising more than 140 million animals annually, as certified farms and ranches, ranging from Step 1 to Step 5+.

Cornell University Northeast Beginning Farmers Project and Online Poultry Production Course http://nebeginningfarmers.org/

Dole & Bailey

Provide consultation free of charge to producers selling to them.

Carl S. DeMatteo

Executive Director

Northeast Family Farms

Phone: 781-935-1234 x 129

Email: cdematteo@doleandbailey.com

Maine Beef Industry
http://www.mainebeef.org/organicbeef-mofga.aspx

Vermont Grass Farmers Association
http://www.uvm.edu/~pasture/?Page=vgfa.html

Maine Grass Farmers Network
http://umaine.edu/livestock/mgfn/

Northeast Pasture Consortium
http://grazingguide.net/

Northeast Organic Farming Association of Vermont.
Dairy & Livestock technical Assistance Program
http://nofavt.org/programs/tech-assistance-education-dairy-farming

University of Maine Extension
http://umaine.edu/livestock/beef/
http://umaine.edu/livestock/poultry/
http://umaine.edu/livestock/sheep/
http://umaine.edu/livestock/swine/

University of Vermont Extension
http://www.uvm.edu/extension/agriculture/livestock/

University of New Hampshire Extension
http://extension.unh.edu/Agriculture/Dairy-Livestock-Poultry

Bryan Petrucci
bryan.petrucci@gmail.com

Production Protocols. See Appendix VII for detailed descriptions for:
Niman Ranch
Pineland Farm Natural Meats
Northeast Family Farms (Dole & Bailey)
Global Animal Partnership 5-Step Animal Welfare Rating Standards

Dairy

"Got milk? More Americans aren't bothering." *CBS Money Watch*. June 4 2014

Vermont

DairyVision

A team of dairy business consultants evaluate dairy farm operations.

Identify needed areas of improvement and work with the farmers to develop goals and solutions. Improve animal health and crop production, reduce operating costs and labor, implement green technologies, reduce environmental impact, improve net profit and enhance the overall business operation. Assist in implementing these solutions, including seeking financing if necessary. Measure the financial progress and success of the dairy operation.

Provide follow up meetings to monitor and support progress toward goals and solutions.

Louise Calderwood at dairyvisionvt@gmail.com or 802-586-2239

NOFA-VT Dairy & Livestock technical Assistance Program

http://nofavt.org/programs/tech-assistance-education-dairy-farming

University of Maine Extension

http://umaine.edu/livestock/dairy/

University of Vermont Extension

http://www.uvm.edu/extension/agriculture/livestock/

University of New Hampshire Extension

http://extension.unh.edu/Agriculture/Dairy-Livestock-Poultry

Fruits & Berries

Vermont Vegetable and Berry Growers Association

http://www.uvm.edu/vtvegandberry/?Page=WelcomeVVBGA.html

University of New Hampshire Extension

http://extension.unh.edu/Agriculture/Fruit-Vegetable-Production

University of Maine Extension

http://umaine.edu/agriculture/home/aronia/

http://extension.umaine.edu/blueberries/

http://extension.umaine.edu/cranberries/

http://extension.umaine.edu/agriculture/programs/small-fruits/

http://extension.umaine.edu/fruit/

Northeast Organic Farmers Association of Vermont
http://nofavt.org/programs/technical-assistance-education-vegetables

John Hayden, The Farm Between
Fruit & Berry Consultant
http://www.thefarmbetween.com/contact-us

Walden Heights Nursery & Orchard
http://waldenheightsnursery.com/consultation-services

Value Added Technical Production

Vermont Food Venture Center
http://www.hardwickagriculture.org/vermont-food-venture-center

Vermont Food Consulting Services
Morrisville, VT

Smits Dairy Consulting LLC
fonssmits@yahoo.com

Dairy Consulting Group
www.dairyconsultinggroup.com

Business, Enterprise, and Financial Planning; Feasibility Studies; Marketing

Vermont
Vermont Farm Viability Program
University of Vermont Extension
Intervale Center
Northeast Organic Farmers Association of Vermont
Vermont Sustainable Jobs Fund
Vermont Agricultural Development Program
Small Business Development Center
Vital Communities
Women's' Agriculture Network
Independent Consultants

New Hampshire
New Hampshire Community Loan Fund
University of New Hampshire Extension

Maine

University of Maine Extension

Maine Farmland Trust. http://www.mainefarmlandtrust.org/programs/farm-viability/

Maine Department of Agriculture. http://maine.gov/agriculture/mpd/business/

Maine Organic Farming and Gardening Association. Cheryl Wixson. 207-237-2636 (direct) cheryl@mofga.org

CYON Business Solutions, http://www.cyonsolutions.com/

Financial Support: Loans, venture capital, and grants

New Hampshire Community Loan Fund

Vermont Community Loan Fund

Vermont Economic Development Authority/Vermont Agricultural Credit Corporation

Farm Services Agency

The Carrot Project

Northeast Organic Farmers Association of Vermont Loan Fund

Vermont Housing and Conservation Board Farm Viability Program

Vermont Sustainable Jobs Fund

Working Lands Grant

USDA Value-Added Producer Grants

USDA Rural Development Energy Grant

Slow Money Maine and Vermont chapters

Land Conservation/Agro-Forestry

Wildlands and Woodlands: http://www.wildlandsandwoodlands.org/

Vermont Land Trust

New Hampshire Land Coalition

Ammonuoosuc Conservation Trust

Maine Farmland Trust

Maine Coastal Heritage Trust

APPENDIX III

Protein Institutional Sales Models Detail

Institutional demand for livestock, beef in particular, was documented in the New England Beef to Institution Marketing Study in 2011. The bulk of the need (86%) is for raw, bulk ground beef. Two business models are currently in use that could be replicated on a regional basis to service this demand: the producer and the processor driven model.

The **producer-driven** model is designed for the buyer with decision making control and a proactive desire to source local beef. The **processor-driven** model is designed to service the institutionalized process- and price-driven buyers. The models create opportunities for beef producers, dairy farmers, and processors.

The market

The institutional market is made up of two distinct audiences, buyers who have autonomy and decision-making control, whose primary decision making factors are the animal management practices used to produce the beef they are buying and a desire to support the local economy, and buyers who are price sensitive and driven by routine whose primary purchasing decision making factors are price and the degree to which the product is incorporated into their existing order and purchasing mechanisms. The first buyer profile made up 29% of the study's respondents and would support product priced at $4-5/lb.; the second buyer profile made up 53% of respondents and would support a $2-3/lb. price point. If product were available at $2-3/lb. the initial size and scope for a local beef to New England institutional market came to 1,547,700 pounds per year of which 1,331,022 pounds is raw, bulk ground beef. [1]

The producer-driven model

- Limited in its ability to create widespread regional impact on the amount of local beef sold to institutional markets
- Best suited for small scale volume producers:
    - Who want to be involved in the sales transaction
    - For beef and dairy producers who are engaged in retailing beef and have direct sales channels for other cuts from the animal
    - For producers who are charging a premium for their product

1 Wilson R., Andersen C., Calderwood L., Rumley K. *New England Beef-to-Institution Marketing Study.* 2011

- Best suited for institutions who:
    - Are actively seeking local food
    - Want to take the time to develop a direct connection to the producer
    - Value specific attributes of the beef they buy, such as grass fed
    - Have a flexible cost structure or budget to pay a premium for those attributes and the relationship.

The producer-driven model requires the producer to be the point person selling the product, and coordinating its processing and delivery. The producer-driven model offers the most opportunity for educational outreach and community building because of the direct connection between the farm and the buyer; it also offers the greatest opportunity for profitability for the producer. The producer-driven model also presents the greatest logistical hurdles, it is time consuming and complicated on the buyer end, it is time consuming and complicated on the producer end, it can be difficult to secure processing services, and variability in quality of those services can be damaging to the long-term success of the business relationship.

The processor-driven model

- Offers the majority of the opportunity for regional beef to enter the institutional market.
- Is best suited for farms:
    - That have culls as a cost center and need to find the most efficient and economical return on investment for them.
    - Are not seeking diversified markets or new enterprises.
- Is best suited for buyers
    - That are price- and process-driven institutional buyers who may value the concept of buying local but whose budgets and routine still dominate their decision making.
- Is best suited for processors who:
    - Seek opportunities to create markets for themselves
    - Have established sales channels and markets
    - Are interested in expansion or optimizing efficiency and return on assets of existing infrastructure
    - Are resourceful

In this model, the buyer-seller relationship is anchored around the processor and the institution or wholesaler servicing the institution. The processor-driven model presents several advantages to serving the institutional market. These advantages enable the processor-driven model to overcome five otherwise insurmountable hurdles to large scale penetration of the institutional market:

1. Sufficient volume of product
2. Streamlined ordering and delivery system

3. Access to processing services
4. Cost efficient processing
5. Ability to compete on price

Processor-driven model advantages:

- Access to unlimited raw materials

The average annual cull rate on conventional dairies is one third of the mature dairy head. The cull rate reported from the producers interviewed for this research ranged from 19% for dairy to 2% for beef. At the time of this report, New England had 216,100 mature dairy, not to mention its beef herds. Even at a 19% cull rate, this represents 41,059 culls available to supply local demand, more than sufficient to meet the 4,030 cull needs on the institutional market. While 4,030 culls may be difficult for anyone producer or group of producers to coordinate, processors have connections and relationships with a wide network of farms in their area, thus they have are well suited to initiate outreach and source culls as needed to meet buyer demand. Unlike producers, they are not limited by a single farm's production. Because of this, the processor-model immediately resolves issues of insufficient volume and provides a streamlined sales channel for the buyer.

- Control of Processing Services

Because the processor also controls the processing services, they have the ability to resolve issues three through four at their discretion. With authority over the processing schedule, the processor can elect to work overtime, evaluate the financial feasibility of expanding hours/days of kill floor use and cutting, and analyze the schedule to fit these animals in on slow days as ways to service the new market without compromising service to existing customers. By controlling the cut sheet, the processor has a cut sheet aimed at optimizing efficiency and turning out volume, further creating processing efficiencies. Time for a custom cut-sheet can reduce productivity by 50% or more, slowing the process from one to two or more hours per animal.

- Existing Sales Channels for Prime Cuts

According to the processors interviewed 50% of their volume is built around their own private label products in which they buy animals and resell the meat. Processors are experts at efficiently processing animals and harvesting all usable parts for sale. Their core competency is on processing and selling meat. In a business built around tight margins, it will be more effective for long term success and regional replicability for the processor to handle the responsibility of selling and marketing the remainder of the carcass to finance an institution's purchase rather than requiring the buyer or producer to assume the role.

While the processor-driven model does not represent significant monetary gain to farms or processors, it does present the opportunity for dairy farms to receive a better price for their culls than the traditional options currently at their disposal because it will pay the going commodity rate, without deducting commission or trucking fees, and since the animals' destination is local, they will likely arrive less dehydrated and in better condition,

yielding a better live weight. For processors it represents the opportunity to make marginal profit per unit, but with a high turn-over potential, thus reasonable increase to overall income over time. This increase in work flow will also improve return on assets, increase year round cash flow, and encourage retention and expansion of trained work staff and hours of operation.

The processor-driven model works when the price point, including any distributor mark-up, falls within an institution's price sensitivity range. This range will be largely based on the current commodity pricing for ground beef, the type of institution, and the volume the institution is buying. The range will fluctuate up and down corresponding to the market. The feasibility for a processor to be successful in this market will depend on operating expenses and the ability to derive income from the other parts of the animal. In general, what the processor charges per pound for the ground beef needs to at a minimum cover the cost of purchasing and processing the animal. The opportunity for profit will come from the income received for the other cuts of the animal. Theoretically, the main variable affecting the price of ground beef is the price paid for the animal. This occurs when the processor's operating expenses and volume of ground beef to live weight ratio stay relatively constant, and the spread between the price paid for the animal and the price charged for the ground beef covers the operating expenses. On average this is also the single variable affecting the price fluctuations of the global market. As long as the local product is competitive at any one point and time, it should remain competitive at any and all times, even with global market fluctuations because it will be trending up and down in a static ratio to the global market price at a ratio that has already been deemed acceptable by the buyer.

Financial viability will therefore be dependent on the spread between the going rate for culls, the going rate for ground beef, and the spread needed in between for the processor and distributor to break-even/make a profit. In general the processor/price sensitive driven model can work as long as:

- The processor can generate break even or better off the ground beef and generate profit from harvesting and selling other parts of the carcass such as tenderloins and rib eyes.
- The price to institution including any distributor markup can still hit the $2.00-3.00/lb. price range for bulk ground beef.

APPENDIX IV

Other Opportunities

Consumer Grade Oil and Livestock Feed
Full Sun Company, David McManus & Netaka White, Co-founders

www.fullsuncompany.com
Startup, 2011. Official launch 2013-14. Full Sun is a Vermont based purchaser, processor and marketer of specialty oilseed crops. We're building a network of local and regional family farms to grow organic and non-GMO soybeans, sunflowers and canola, which we'll process in our Vermont mill into craft culinary oils and high-protein livestock feed ingredients. The oil that our foodservice customers use for cooking is to be collected and converted by others into biodiesel, and it returns to our farm partners, completing Full Sun's "Farm-Food and Energy" cycle. We've created a business model that can compete at a local and regional scale, provide fresh, affordable and healthy consumables for people and livestock, and even generate some of the energy needed to fuel delivery trucks and farm machinery.

"We recently secured two investor lenders last week including The Castanea Foundation totaling $205,000. We're actively looking to raise $250,000 more, plus find a loan guarantor or co-signer for a $180,000 equipment purchase in order to launch Full Sun in Hinesburg VT by early 2014."

Bio Diesel
The Vermont BioDiesel Project

http://www.vsjf.org/projects/vermont-biodiesel-project

The future and security of Vermont's liquid energy supply led a group of organizations to initiate the Vermont Biodiesel Project. This two year venture (2004-2006), funded by the U.S. Department of Energy State Energy Program and Vermont Sustainable Jobs Fund, set out to develop a market for biodiesel and Bioheat ® in the state through a set of pilot programs and market building activities.

Wood/Heat/Renewable Energy/Food Waste

Opportunity for wood/waste wood/hay as a heat source opportunity for agri-business

EVO Boilers Concept: "Local Biomass Solution for a more Ecological and Economical World"

Renewable Energy Resources, Farr's Tree Service, and Green Mountain Harvest are partnering to demonstrate how communities can foster energy independence, environmental sustainability, a strengthened forestry/agricultural sector, and cost savings through access to American made, 94% efficient biomass boilers, redirecting purchasing

power to lower cost, local, renewable forestry and agricultural by-products. $0.78 cents of every dollar spent on fossil fuel leaves the community. With EVO boilers, 100% of each dollar stays locally, replacing every 100 gallons of fossil fuel with 1 ton of local biomass. The project encourages forest and field stewardship providing revenue for otherwise waste product to foresters and farmers. The project is meant to be a model for Vermont and encourage adoption of the system by at least two additional commercial agricultural users in the Waitsfield-Warren region within three years. EVO boilers and energy independence at the community level using by-products/waste hay and waste wood that would could provide supplemental income for farms and loggers while producing heat at a 94% efficiency. The initial model is hoped to be installed at Green Mountain Harvest (a hydroponic greenhouse facility) in Waterbury, VT.

Non-traditional forest products:

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802-951-6771 x1060
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Emery, Marla R. 2002. Historical Overview of Nontimber Forest Product Uses in the Northeastern United States. *In Non-Timber Forest Products in the United States*, edited by E. T. Jones, R. J. McLain and J. Weigand. Lawrence: University Press of Kansas

Emery, Marla R. and Rebecca J. McLain (Eds.). *Non-Timber Forest Products: Medicinal herbs, fungi, edible fruits and nuts, and other natural products from the forest*. Binghamton, NY: Haworth Press. 2001.

Michelle J. Baumflek, Marla R. Emery, Clare Ginger
Culturally and Economically Important Non-timber Forest Products of Northern Maine. 2010
Non-timber forest products (NTFPs) gathered for food, medicine, craft, spiritual, aesthetic, and utilitarian purposes make substantial contributions to the economic viability and cultural vitality of communities. In the St. John River watershed of northern Maine, people identifying with cultural groups including Acadian, Maliseet, Mi'kmaq, Scotch-Irish, and Swedish use more than 120 wild plant and fungus species. We interviewed both gatherers and land managers about NTFP uses that are significant in this region and about factors that facilitate or limit gathering, including access to gathering sites. This handbook and its accompanying Web site (http://nrs.fs.fed.us/sustaining_forests/conserve_enhance/special_products/maine_ ntfp/) present our overall study findings as well as in-depth species profiles of 30 non-timber forest products including brown ash, paper birch, blueberries, high-bush cranberry, and fiddleheads. http://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs68.pdf

Aquaculture

According to the National Oceanic and Atmospheric Administration (NOAA), Americans consumed an estimated 15.8 pounds of seafood per person per year and spent roughly $80.2 billion for fishery products in 2010. Today, **86 percent of seafood consumed in the United States is imported**, and about half of this is wild-caught. The United States mainly imports seafood from China, Thailand, Canada, Indonesia, Vietnam, and Ecuador. Our top imports (by volume) include shrimp, freshwater fish, tuna, salmon, ground fish, crab, and squid.[1] Top imported sellers by value and volume were shrimp at $4.27 billion and 1.2 billion pounds respectively and freshwater fillets/steaks (fresh & frozen) at $1.14 billion and 559 million pounds respectively.[2]

"Shrimp became the number one consumed seafood product in the U.S. in 2002 and has stayed in this position ever since. Tuna, primarily canned tuna, dropped to second place and has stayed at this level. Salmon replaced Pollock as the number three preferred product in 2003 and has remained there. In 2006 catfish dropped from fifth to sixth place... and in 2009 consumption of catfish decreased to 0.85 pounds per person per year. Tilapia was not among the top ten preferred products before 2002, but went from ninth place in 2003 to fifth place in 2006 and has remained there with 1.21 pounds being consumed by each American in 2009."[3]

During the past 20 - 30 years, aquaculture in the United States grew into a major industry. In the South, the top farm-raised warm water fish are catfish and tilapia, while cold water types include salmon (grown off the coasts of Maine and Washington), sea bass, and cod. Development of aquaculture systems in the northeast will most likely focus on either cold water species such as trout grown in outdoor ponds or warm water species grown indoors, perhaps in an integrated system with vegetables.

Whether New England offers attractive opportunities compared to other parts of the country requires further research and analysis. For example:

> "Bell Aquaculture LLC celebrated on July 1 the grand opening event for its Bell Farms Aqua Feed mill located in Albany, Indiana, U.S. This mill represents the last major step toward completion of a vertically integrated aquaculture farm that has long been in development by the team at Bell. This vertical integration includes a 1,000 tonne fish farm, an in-house processing facility and production of value added products generated from capture and cultivation of by-products.
>
> Led by Dr. Steven Craig with over 25 years of experience in fish nutrition, the feeds from this mill will be tailored to the nutritional, biological and physiological needs of specific species at key points in the life cycle of the fish. The mill will be the first of its kind to produce feed locally to service the aquaculture industry on a mass scale. Bell Farms (expects) to produce approximately 2 million pounds of feed per month sourcing over half of ingredients locally."[4]

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1 Fish Watch. NOAA.

2 Data compiled by the National Marine Fisheries Service (a division of the NOAA).

3 "U.S. Farm-Raised Catfish Industry 2009 Review and 2010 Outlook." Dr. Terry Hanson, Auburn University and Dave Sites, Mississippi State University.

4 "Aqua feed mill opens in Indiana. " World-Grain.com. July 2 2014

For this study we focused on aquaponics, a food production system that combines aquaculture with hydroponics (cultivation of plants in water) into a symbiotic environment. The nutrient rich fish waste produced in an aquaponic system nurtures soil-less plants and the plants and bacteria (nitrification) clean the water for the fish. Aquaponics, allowing a producer to control the ambient growing environment, provides the ability to maximize square foot production by supporting year-round harvests, significantly greater crop yields, and unique flexibility for what products to cultivate and when based entirely on economic market factors.

Aquaponics presents some limitations or constraints on a grower. The most efficient systems maintain a steady temperature throughout the hydrological system. Therefore, mixing cold water fish with "warm-water" plants is cost prohibitive, since the expense to heat and cool the water is substantial. Moreover, the most productive systems for grow time and volume of consumables require warm water. Therefore, the choice of symbiotic fish/plant relationships for the producer requires both thrive in warm-water. This creates limitations on the fish species an aquaponic grower can select and the need for heat sources to support production.

An added complication is, by producing a number of varied seasonal products, a grower's job to sell products becomes more complicated and requires up-to-date knowledge and awareness of current and yearly market trends. However, with good marketing skills and knowledge, aquaponics creates a niche for out-of-season produce, like lettuce, year round.

Production Capacity

Aquaponics systems require minimal land base but access to ample clean water, affordable energy (including three phase power), and efficient transportation into population centers is essential for profitable production. The initial capital investment in tanks and pumps is sizable. Because fish do not require specialized lighting and ventilation, buildings originally intended for other uses can be reused for fish production.

Processing

The closest processing facility for fish is located in Gloucester MA. Sales of live animals into ethnic markets is possible but can vary depending on season and access to fish brought in from other regions. Regulatory oversight for processed vegetables produced through aquaponics remains unclear based on Food Safety Enhancement Act requirements.

Marketing Potential

Aquaponics can produce a wide range of leafy greens and herbs that match regional demand to maximize the overall economic opportunity. A marketing advantage of aquaponics is the ability to produce vegetables year-round while at the same time being able to respond to market demands for particular products. A potential producer works with distributors to forecast and select products to cultivate based on demand. Organic labeling of fish or plants is not possible from aquaponic systems but marketing claims are possible based on location and sourcing of feed ingredients.

Opportunities

On a global level, aquaculture emerges as a major factor to meet human protein needs as the populations continue to expand. However, in New England, limited opportunities exist to foster economic development through aquaculture or aquaponics. The high volume, low margin nature of the products, coupled with the high energy and feed costs of the region, minimize the prospect of profitable production at the present time.

Whole Foods Market Regional Offices

North Atlantic

125 Cambridge Park Drive

Cambridge, MA 02140

617.492.5500

617.492.5510 fax

- Connecticut (Central Connecticut)
- Maine
- Massachusetts
- Rhode Island

Mid-Atlantic

5515 Security Lane, Suite 900

Rockville, MD 20852

301.984.4874

301.984.2064 fax

- Kentucky
- Maryland
- New Jersey (Marlton and Princeton only)
- Pennsylvania
- Ohio
- Virginia
- Washington D.C.

Northeast

930 Sylvan Avenue

Englewood Cliffs, NJ 07632

201.567.2090

201.567.2067 fax

- Connecticut (Western Connecticut)
- New Jersey (excluding Marlton and Princeton)
- New York

APPENDIX V

Case Study: Red Tomato - A Distribution Model

In 1985, Michael Rozyne co-founded Equal Exchange, a fair trade cooperative business, and was the head buyer and marketing manager for Northeast Cooperatives in Brattleboro, Vermont, a consumer-owned natural foods wholesaler. In 1996, he took a sabbatical from the fair trade coffee world to explore what it might look like to apply the lessons and principles of the fair trade movement to support farmers in the northeastern U.S.

Local food had yet to grab the attention of consumers, retailers, food writers or policy makers, but it was clear that small and medium sized farmers were losing their ability to compete in an increasingly consolidated, global marketplace. At the same time, fresh produce available to consumers had lost much of its flavor, seasonality, and even nutritional value thanks to standardization and long-distance transport and storage. In 1996, Red Tomato was born out of the search for a way to connect farmers with consumers through good produce.

At first, Red Tomato functioned as a small warehouse and distribution operation, in addition to marketing, selling and helping to develop new products. Eventually, it became clear that a conventional distribution model at that scale could not compete economically. In a risky and carefully considered shift, Red Tomato closed its warehouse, cancelled its truck lease, and began to concentrate on managing logistics through a network of farmers, independent truckers, and wholesale partners. Coupled with renewed focus on marketing, branding, and packaging to help give farms and products more visibility with consumers, this strategy is working!

Red Tomato now markets produce for a network of over 40 farms, and apple orchards (through our Eco Apple™ program). Over 200 retail stores in New England, New York, and the mid-Atlantic carry Red Tomato produce, as well as a few select markets outside the region. Our marketing and education efforts now reach thousands of consumers, and our produce sales grow steadily each year.

What raw or processed farm or food products originate from your locale? Are they grown and/or processed within the study region or beyond?

“Red Tomato’s mission is connecting farmers and consumers through marketing, trade, and education, and through a passionate belief that a family-farm, locally-based, ecological, fair trade food system is the way to a better tomato.... We’re proud to offer these heirloom and new varieties, chosen for taste, beauty and quality, picked at peak ripeness, and packed with flavor and nutrition that comes from good soil, clean water, sunshine, advanced ecological methods, and careful attention.”

"People often ask "What does it take to be a Red Tomato grower?" Or, "How do you go about adding new growers to the network?" The answer often surprises people: it's about relationships. If we need more product than our network can supply, we ask our current growers: "Who do you know? Who do you trust? Who grows peaches as well as you do?" Our growers understand that our brand, which stands for freshness, quality, and flavor, represents them. So, they take these questions very seriously.

We also look hard for growers with wholesale experience - farmers who know how to perform quality control, pack, and ship for the retail market. After that, it's about growers who want to work with us - who strive to consider the food safety, fair trade, ecological aspects of what it means to be part of the Red Tomato network. After all, our farmers are our most valued brand ambassadors– besides our fruits and veggies of course!

Relationship building takes time. As a result, our network grows slowly. We work within the constraints of market demand, the needs of our current farmers, and with a constant eye towards our ultimate goal: creating opportunities for our regions farmers to become primary suppliers of a sustainable food system."

They buy from growers from NE, NJ, NY, and PA:

- Maine: one – Hope Orchards
- New Hampshire: one – Alyson's Orchard
- Vermont: five – Connecticut Valley; Champlain, Saxton's River, Scott, and Sunrise orchards and Harlow Farms
- Massachusetts: nine farms
- Connecticut: seven farms
- New York: six farms
- Pennsylvania: six farms
- New Jersey: four farms

"Red Tomato products are sold by some of the best grocers in the Northeast: partners who know the value of stewardship, quality and loyalty, and who are willing to make the extra effort needed to source and handle fresh local produce. It takes effort such as receiving a shipment when the product is freshest, and ordering carefully week by week, so tender berries and just-perfect peaches don't sit on the shelf too long, but are plentiful for the Saturday shopping rush. When you see Red Tomato products in your grocery store, thank the produce buyer for going the extra mile to be a good partner to a good farmer.

Part of Red Tomato's mission is to make these exceptional products accessible to consumers where they shop and eat - supermarkets, natural grocery chains, coops, independent grocery stores, and institutional pioneers and restaurants with a commitment to local products."

RETAILERS	
Bacon Street Market. Natick MA	Omni Foods. Guilford NH
Balducci's. NYC and CT	Pemberton Farms. Cambridge MA
Compare Supermarkets. Chelsea MA	Philbrick's Market. NH
D'Agostino. NYC	Phoenix Fruit Market. Orleans MA
Donelans Supermarket. MA	Trader Joe's
Kings Supermarkets. NJ	Whole Foods. North Wales PA
Lees Market. Westport MA	Windfall Market. Falmouth MA
Market at Pine Hills. Plymouth MA	
DISTRIBUTORS	
Associated Grocers NE. Concord NH	Katsiroubas Produce. Boston MA
Baldor Specialty Foods. NYC and Boston	Lancaster Farm Fresh Cooperative
Black River Produce. Springfield VT	Regional Access. Ithaca NY
Connecticut Farm Fresh Express	RLB Foods. West Caldwell NJ
Disilva Fruit Distributors. Chelsea MA	Don Shapiro Produce. Everett MA
Dole & Bailey (wholesale). Woburn MA	Sunshine Logistics. Ephrata PA
Food Ex. Boston MA	

Why Regional?

"Depending on where you live or how you buy your food, "local" can mean your backyard, or your bioregion. In places with long growing seasons and diversified crops, local could mean a county or a state. In an area like the Northeast (New England, PA, NY, NJ), with a lot of small states and microclimates, it makes sense to think of the entire region as part of our local food source.

At Red Tomato, we depend on the bounty of the Northeast to ensure that we are able to offer products grown nearby throughout the growing season. This way, when it is too hot to grow lettuce in our southern tier (NY, NJ, and PA) we may still be able to source it from growers in New England. Likewise, our southern growers enable us to kick off the season a few weeks earlier in the season (and go a little later in the fall) - bringing you the best quality produce, grown as close to home as possible, for as many months as the region allows.

When you buy food close to home, there are many benefits:

- Regional Economies: Your hard-earned money stays in your region, which in turn helps farms and businesses survive over the long haul.
- Preserving Farms: Thriving farms keep land in agricultural use and fertile soil from being covered over with buildings and cement.

- Environment and Health: Reduced storage and travel time help local and regional products retain higher nutrient value, and use less energy, than their distant cousins shipped from across the country or across the globe.
- It tastes great! The most important part of this equation: local and regional food is fresh and fresh is delicious.
- Whatever local means to you, we're confident that once you try the top quality produce that is grown by our network of Northeast growers, you will agree that a regional tomato really is a better tomato.

The company buys produce and fruit from the following (see notes below table):

1. A. Tonetta and Son Farm. NJ	2. K. Schlegel Fruit Farm. PA
3. Alyson's Orchard. NH	4. Kiwi Korners. PA
5. Beekman Orchards. PA	6. Landisville Produce Coop. NJ (4)
7. Blue Hills Orchard. CT	8. Lyman Orchards. CT
9. Botticello Farms. CT	10. Marolda Farms. NJ
11. Breezy Hill at Stone Ridge. NY	12. Maugeri Farms. NJ
13. Little Acre Farm. PA	14. Meadow View Farm. PA
15. Cecarelli Farm. CT (1)	16. Ojai Valley Pixie Growers. CA (7)
17. Cedar Meadow Farm. PA (2)	18. Oké USA (8)
19. Champlain Orchards. VT	20. Orbaker's Fruit Farm. NY
21. Clark Brothers Orchard. MA	22. Paul Mazza's Farm. VT
23. Connecticut Valley Orchard. VT	24. Plainville Farm. CT
25. Dagele Brothers Produce. NY	26. Pleasant Valley Gardens. MA
27. Daughters 5 Farm Stand. NY	28. Ploch Farms. NJ (5)
29. Davidian Brothers Farm. MA	30. Rogers Orchards. CT (6)
31. DiBella Brothers Farm. NJ (3)	32. Saunderskill Farm Market. NY
33. Dzen Brothers. CT	34. Saxtons River Orchard. VT
35. Farmer's Garden. MA	36. Scott Farm. VT
37. Fishkill Farms. NY	38. Smiarowski Farm. MA
39. Four Town Farm. MA	40. Sunrise Orchards. VT
41. Hepworth Farms. NY	42. Truncali Farms. NY
43. Hope Orchards. ME	44. Twin Oaks Farm. MA
45. Indian Ladder Farms. NY	46. Ward's Berry Farm. MA
47. J. Glebocki Farms. NY	

1. **Cecarelli Farm** is a founding partner in Red Tomato's Freshness program with Connecticut-based Balducci's stores, which delivers high quality produce to stores within 24 hours of harvest.

2. **Cedar Meadow Farm**. Steve Groff is also a proponent of no-till farming, a method which, like cover cropping, preserves the important microbes and organic matter in the soil and protects against erosion. Some of his fields have not been touched by any tillage equipment for over 30 years! Cover crops used in conjunction with no-tillage systems is the ideal scenario for building soil quality; no-till farming preserves nitrogen in the soil while cover crops make the element available to the cash crops.

3. **DiBella Brothers** has been an anchor grower for Red Tomato's groundbreaking Local, Fresh 24/7 program with Kings Supermarket, bringing the freshest produce possible to the supermarket shelves within 24 hours of harvest.

4. This legacy of quality and reliability is the reason the co-op has been in business since 1914. It may not be the biggest but the **Landisville Co-operative** is the oldest produce co-operative in the country.

5. This mindset has made **Ploch Farms** a key partner in Red Tomato's pilot project with Kings Food Markets branded, Local Fresh 24/7 where product is delivered from farms in Southern New Jersey to market shelves within 24 hours.

6. Originally a diversified farm with crops ranging from tobacco to tomatoes, **Rogers Orchards** is now the largest apple grower in Connecticut. The family grows peaches, pears, plums, nectarines and pumpkins which they sell in several wholesale markets, in their two farm stands and as pick your own.

7. **Ojai Valley Pixie Growers**. As part of a pilot to expand winter sales, Red Tomato has teamed up with a network of 40 family farms in the Ojai Valley of California to find new markets for the Ojai Pixie tangerine (will link to product profile). The family farmers that grow these mouthwatering tangerines, rarely seen on the East coast, are dedicated to keeping family-scale agriculture viable in southern California. The West end of the Ojai Valley has a unique microclimate that produces excellent tasting fruit - some people call it the "Napa Valley" of tangerines. Keeping flavor their top priority, the Ojai farmers harvest their tangerines only when the fruit is at its peak for flavor. With a mind towards the health and well-being of their customers, Pixie growers use Integrated Pest Management (IPM) in their orchards and do not coat their fruit with wax, resin, fungicides or any other chemicals for packing or travel. This network of farmers is very similar to Red Tomato's network of apple growers in their approach to farming and marketing.

8. **Oké USA**. Red Tomato works mostly with family farmers in the northeast U.S. But many of the challenges facing farms here are shared by farmers all over the world. In 2006, Red Tomato took a new step to link our work with farmers and fresh produce to our roots in the fair trade movement: we helped to launch the first 100% fair trade tropical fruit company in the U.S.

Oké USA is a farmer co-owned fair trade banana company that seeks to make international trade a little bit more "Oké." The ownership structure - a partnership between the farmer coops, Red Tomato and two fair trade companies, AgroFair and Equal Exchange - is a key part of their commitment to empowerment of communities through fair trade. Oké bananas come directly from farmers who are paid a fair price. That means higher wages, safer working conditions and a cleaner environment for farmers, workers and their families.

In 2009, Oké USA rebranded their fairly traded, organic banana under the Equal Exchange label. Now consumers can find a banana that they recognize to represent their social and environmental values in their favorite grocery store. Join the banana revolution! Learn more at Beyondthepeel.com.

Logistics. The orchestration of a complicated network of shipping, storage and delivery routes to get fresh produce from the farm to the store, while it is still fresh– is one of the most magical aspects of the Red Tomato supply chain. The magician in this realm is our Operations Manager (and logistics expert) Angel Mendez. In Red Tomato's early days, we owned and operated the supply chain: we picked up the product, we stored it, and we delivered it. However, the wear and tear of maintaining trucks and warehouse infrastructure proved to be a drain rather than an asset, and meant that we could not give marketing, product development and sales the attention needed. In the fall of 2002, we closed the warehouse and completely restructured the supply chain.

Network coordination. We reinvented our distribution operation as a coordinated network that makes more efficient use of existing trucks, on-farm storage, and consolidated warehouse infrastructure. This low-overhead approach gets the product moved, and lets us focus on what farmers need most: marketing & promotion, managing supply, and developing strong relationships with retail and wholesale buyers.

Processing, packaging, packing

Growers in the Red Tomato network harvest, process, pack, and store what they grow. Red Tomato coordinates the design and production of packaging (designed specifically for their farm and product), which adds value and traceability for the buyer and consumer. Most Red Tomato growers have the facilities and equipment to pack and store, on the farm, and the few that don't, work in collaboration with other growers in the network to pack and/or store their product.

Consolidation points

In order to streamline trucking routes, Red Tomato Operations Manager, Angel Mendez, works closely with farmers in the network to gather product at consolidation points on centrally located farms, at the produce market in Chelsea MA or at distribution centers. Consolidation is particularly crucial when orders from a single farm are not large enough to fill a truck (less than full load LTL) which can drive up the cost of trucking. When farmers work together to consolidate product at one pickup point, Red Tomato can help lower the cost of shipping.

Direct Store Delivery (DSD) vs. Distribution Center (DC)

Red Tomato products arrive to a retail produce department one of two ways: direct store delivery (DSD in industry lingo) and through a distribution center (DC). With really sensitive products, like strawberries, or when a farmer has a relationship with a particular store buyer, we sometimes set up trucking that takes fresh produce from the farm (or consolidation point) directly to the store. More often, however, we are working with our trucking contact to haul products into a store- or distributor-owned distribution center. Once at the DC, the store or distributor then ships our products to their final destination.

Coordinating Supply and Orders

While much pre-planning goes into the off season, around price, supply, and demand, once the season hits, staying on top of quantity of product, harvest timing, and, of course, quality can be a bit of a wild ride. It often takes twice, or more, daily phone calls between growers and buyers to put together a final order. Sometimes, weather drives last minute changes and countless more phone calls. This work is all done by our tireless Product and Account Managers, with the help of our Operations Team.

Trucking

Red Tomato trucking is done by a network of regional growers and third-party truckers. In order to get products from a farm to the store or DC efficiently it may ride on two or three different trucks in a 24 hour-period. The cooperation and creativity of these companies and drivers, enables Angel to run a tight ship. We currently work with the following farmers and trucking companies:

Andrews Trucking
Aurora Farms
Black River Produce
CF Logistics
Chang Farm
D&S Logistics
Hepworth Trucking
J&D Transport
Kegels Produce
Krichmar Produce
Mother Earth Organic Mushroom
Pizini Mushroom
Regional Access
Sunrise Logistics
Total Quality Logistics
Lancaster Farms

APPENDIX VI

Regional resources

Inter-institutional Network for Food, Agriculture and Sustainability

Established in 2010 with an endowment from the W.K. Kellogg Foundation, the Inter- institutional Network for Food, Agriculture and Sustainability (INFAS) is a national network of university and college educators, researchers, and activists, who collaborate in analysis, synthesis, and problem-solving with practitioners to increase U.S. food-system resilience; to illuminate critical trends and common stewardship of public goods essential for food systems, such as water, biodiversity, ecosystem services, and public institutions; and to reduce inequity and vulnerability in the U.S. food system.

Chatham University

- Allen Matthews, Director of Sustainable Agriculture, School for Sustainability and the Environment

College of the Atlantic

- Molly Anderson, Partridge Chair in Food and Sustainable Agriculture Systems

University of New Hampshire

- Tom Kelly, Director, UNH Sustainability Institute

University of Vermont

- Linda Berlin, Director, Center for Sustainable Agriculture

Institute for Agriculture and Trade Policy

"Measuring Success: Local Food Systems and the Need for New Indicators" June 3 2014

In agriculture, policymakers, analysts and researchers often use a set of indicators to assess whether a farming system, or new technology, is succeeding. The most common indicators focus on increasing "yield," often of a singular crop or animal unit, within large-scale production systems. The use of indicators focused almost exclusively on production helps to shape scientific research and public policy. But just as weight alone is not a good measure of human health, a single-minded focus on production is an inadequate measure of the health of a farming system. So long as yields are high, this narrow focus supports the illusion that our agricultural system is meeting the nutrition, health, environmental sustainability, rural development and other needs of the population.

Farming produces multiple products. The most obvious are food, feed, fiber and raw materials for conversion into other food and non-food products (such as energy, materials, etc.). Done right, farming also contributes to better soil health and water quality, wildlife habitat, recreational opportunities and carbon storage. Unfortunately,

less desired products are often produced as well, such as pollution to ground and surface water and air, with detrimental impacts to human and animal health.

Yet, despite the clear reality of these multifunctional outcomes of agriculture and the important roles these products play in our environment, society and economy (for better or worse), we lack the means to assess them accurately. To truly measure the value and sustainability of local food and farming systems, we need indicators that are multidimensional and cross-disciplinary, and that fully capture the range of outcomes contributing to the success of the system.

There is growing support within the U.S. and around the world for less chemical-intensive, more ecological approaches to agriculture—including systems that produce healthy food for local markets. These systems have the potential to provide a whole host of benefits—from environmental to social to health—that are currently neither assessed nor valued under most current scientific research and public policy regimes. There is some evidence this is changing. Both the USDA's Food Atlas and the state of Vermont's Farm to Table Strategic Plan for 20202 are using a wider range of indicators to measure the food system. But these are the exceptions, not the rule.

With all of this in mind, IATP launched a project in 2012 to begin to establish a research framework for a new set of indicators that would better represent the diverse benefits of local, agro-ecological food systems and that could be tracked over time. To ground our work, we partnered with the Main Street Project, which has attempted to create an innovative, replicable systems approach to raising free-range poultry, based in Northfield, Minnesota. Working with this project provided a unique opportunity to develop and test these new indicators of success within food production. Measuring Success: Local Food Systems and the Need for New Indicators, collects findings of the project and provides contextual analysis and suggested next steps. See more at: http://www.iatp.org/documents/measuring-success-local-food-systems-and-the-need-for-new-indicators#sthash.m16qCzvl.dpuf

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Genetically Modified Organisms:

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http://www.specialtyfood.com/news-trends/featured-articles/article/most-americans-wont-pay-premium-non-gmo/

Appendix VII

Niman Ranch Beef Cattle Protocols

Niman Ranch's mission is to produce the finest tasting meat in the world by adhering to a strict code of traditional husbandry principles. We have registered the following claims with the USDA:

- All Natural
- No Antibiotics Ever
- No Added Hormones Ever
- All Vegetarian Feeds
- Humanely Raised on Environmentally Sustainable Ranches

I. Source Verification

A representative of Niman Ranch will have a personal relationship with every supplier of cattle to the Niman Ranch beef program and our protocols must be followed from birth to plate.

All cattle must have full traceability. A Niman Ranch representative must pre-approve all cattle in the program and, if practical, visit the ranch or farm where the cattle were born.

All ranchers must sign producer affidavits confirming that their program meets all requirements of this protocol, and the Niman Ranch producer affidavit must be signed prior to or at the time the cattle are contracted for or purchased.

Breeding

Niman Ranch will select cattle based on their ability to produce the finest-tasting beef possible. To be eligible for the program, cattle must be selected by Niman Ranch-approved personnel, and must be Angus or Angus cross breeds that exhibit at least 51% black hide, no neck humps that exceed 2 inches, and no dairy characteristics.

All cattle, and the mothers of the cattle, must have been born, raised, and have spent their entire lives in the continental United States.

II. Husbandry

Our overriding objective is for cattle to be treated humanely, with dignity and respect. Whenever appropriate, they will be allowed to express their natural behavior.

Family Ownership

Priority will be given to cattle that come from ranches where the primary occupation of the owner(s) of the business is agriculture, and where the ranch is managed, leased or owned and operated by the family.

Pasture

Cattle that have been raised on pasture fertilized with human sewage waste are not eligible for the program. Organic fertilizers spread on pastures and / or crop land is acceptable.

Pasture

Cattle that have been raised on pasture fertilized with human sewage waste are not eligible for the program. Organic fertilizers spread on pastures and / or crop land is acceptable. Cattle on abused or over grazed pastures will not be allowed. Runoff will not be allowed to pollute any ponds or streams.

Neglected health problems will not be allowed in the cowherd. Cuts and necrotic prolapses are to be tended to immediately. They are not allowed to become necrotic. Bad eyes and lump jaws are to be removed immediately. There is a need to look for broken tails.

During castration, either by banding or by knife, the calves are to be watched for at least a 24 hour period.

At the home ranch, the cows will be given a body scoring.

Injured and non-ambulatory cattle requiring euthanasia will be euthanized quickly.

Feed & Supplements

Cattle will be fed an all-natural, vegetarian diet of the highest quality feeds. Cattle will never receive feeds or supplements containing any fish, animal or meat by-products (including feather meal), fecal material, or garbage.

Only vitamins, minerals, and supplements listed on Schedule B may be fed to Niman Ranch cattle or cattle raised for the Niman Ranch program.

Antibiotics

Cattle will never be given any added synthetic or natural form of growth hormones, steroids, or other artificial growth promotants.

Cattle will never be given any kind of antibiotics, including therapeutic and sub-therapeutic antibiotics or ionophores. When an animal is sick, it will be treated with the appropriate medications, including antibiotics if their use is necessary to return the animal to health. Mass treatment of cattle with antibiotics is not allowed. Under no circumstances are antibiotics to be used for any purpose other than treating an individual sick animal. Any animal that is treated with antibiotics of any kind is to be tagged and removed from the Niman Ranch program. Beta agonists are not allowed (zilmax, optiflex, etc.)

Vaccines

Only vaccines listed on Schedule C may be used on cattle raised for the Niman Ranch program.

Body Scoring

We will body score the cow herd when auditing a cow calf operation for Niman Ranch. The scoring system is based on a 1 through 9 scale, with a score of 1 or 2 being unacceptable.

BCS 1 = Emaciated

No palpable fat is detectable over the spinous processes, transverse processes, ribs, or hooks. The tailhead and ribs appear very prominent.

BCS 2 = Poor

Animal is still somewhat emaciated but the tailhead and ribs are less prominent. Individual spinous processes are still sharp to the touch. Some tissue cover is present over the ribs toward the top of the back.

BCS 3 = Thin

Individual ribs including foreribs are easily identified but are not quite as sharp to the touch. Some fat can be felt along the spine and over the tailhead. Some tissue cover is present over the ribs toward the top of the back.

BCS 4 = Borderline

Individual ribs may not be visually obvious. Individual spinous processes can be felt when palpated but feel rounded rather than sharp. Some fat cover is present over the ribs, transverse processes, and hooks.

BCS 5 = Moderate

Overall appearance is generally good. Fat cover over ribs feels spongy. Palpable fat cover is present on either side of the tailhead.

BCS 6 = High moderate

A high degree of palpable fat exists over the ribs and around the tailhead. Firm pressure is needed to feel the spinous processes.

BCS 7 = Good

Considerable fat cover is present with a fleshy overall appearance. Fat cover over the ribs and around the tailhead is very spongy. Fat "pones" or "rounds" may be starting to form along the tailhead.

BCS 8 = Fat

The animal is very fleshy and appears overconditioned. Palpation of the spinous processes is near impossible. Large fat deposits are present over the ribs and around the tailhead. Fat pones around the tailhead are obvious.

BCS 9 = Extremely fat

The overall appearance is blocky with extremely wasty and patchy fat cover. The tailhead and hooks are buried in fatty tissue with fat pones protruding. Bone structure is no longer visible and barely palpable. Large fatty deposits may even impair animal mobility.

Figure 3. Body condition scores and descriptions for beef cattle.

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The information given here is for educational purposes only. References to commercial products, trade names, or suppliers are made with the understanding that no endorsement is implied and that no discrimination against other products or suppliers is intended.

By **Jane A. Parish**, Associate Extension/Research Professor, and **Justin D. Rhinehart**, Assistant Extension Professor, Animal and Dairy Sciences

MISSISSIPPI STATE UNIVERSITY
EXTENSION SERVICE
MSUcares.com

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III. Finishing Lot Protocol

All cattle will be finished in a Niman Ranch partner's approved finishing lot.

Feed & Supplements

Cattle will be fed an all-natural, vegetarian diet of the highest quality feeds. They will never be fed animal or meat by-products including feather meal, poultry litter, or aquatic by-products. Only feed and feedstuffs listed on Schedule A and vitamins, minerals, and supplements listed on Schedule B may be fed to Niman Ranch cattle.

All rations and ration changes must be approved before use.

Finishing Lot Husbandry

Feeding facilities and pens will be maintained to ensure the health and safety of our cattle. Pens and shelters will be designed to take into account the natural behavior of the animals and so as not to bring on unnecessary stress or to risk injury or the health of the animals.

Whenever possible, cattle will be housed with their natural social group (animals that were born and raised together).

Any disrepair – broken chutes, gates, pens, exposed nails, etc. will be fixed immediately.

Cattle Handling & Loading facilities:

- Non slip flooring (can be dirt). Less than 2% falls under the NCBA guidline
- Prod score – not over 10%
- When cattle leave squeeze chute, should be walking or trotting (75%) (NCBA)

Cattle will be kept in pens with adequate room to behave naturally; i.e., move freely, exercise, and with sufficient space for each to lie down in a full lateral position simultaneously. At a minimum, there will be between 150 to 300 square feet per head depending on season and geographical location. There also must be at least 1 foot of bunk space per head provided regardless of the animal's age or degree of finish.

During wet months bedding will be provided when appropriate to keep cattle comfortable.

When needed, shade will be provided for the cattle, and sprinklers will be available as needed for cooling and minimizing dust. The use of sprinklers will depend on the dust situation and whether or not there is natural year-round moisture from rainfall.

Cattle that exhibit open-mouth panting must be provided heat relief. Head bobbing is a precursor to open mouth panting. It should be looked out for.

Water will be provided free choice with clean, fresh water constantly available. Troughs will be cleaned regularly. At the troughs, there will be slabs of concrete or packed earth for the cattle to stand on, and cattle will have sufficient room to drink so that they will not need to continually compete for space at the trough.

Persons moving animals must handle them in a way that avoids undue stress. All necessary steps must be taken to ensure that animals are not injured or caused to suffer during loading, unloading, processing, sorting, or transport.

Prods – Electric prods should no be carried around. They can, if necessary, be used for 3 things:

1. An animal won't go into the squeeze chute.
2. Animal is down in the squeeze chute.
3. Animal is down at a truck step.

Cattle will be monitored at least once daily to check for sickness, injury, or distress and to acclimatize them to being around people.

Cattle will have access to a high-quality, balanced ration delivered fresh twice daily at 10- to 14-hour intervals through a Total Mixed Ration (TMR) delivery system. Cattle that are fed through a self feeder will have the same quality feed available to them at all times. Distiller grains must not be above 40% of ration. Optimum ration is 12% to 20%.

All cattle will be processed in a timely manner (within 5 days) after their arrival at the finishing lot to avoid the spread of disease, boost the immune system, and ensure the overall health of the cattle. Vaccination boosters will be administered with every effort to avoid undue stress, and will be administered only in the area in front of the shoulder. At all times, humane handling will be practiced.

In the event an animal suffers accidental injury, it shall receive individual treatment designed to minimize pain and suffering. Injured animals will be housed and transported separately from uninjured cattle. If the injury is serious enough to require it, the animal will be euthanized on the ranch by a trained person.

Every necessary step will be taken to ensure that Niman Ranch approved finishing lots have no negative impact on the environment. Manure and runoff will be managed so there is zero discharge into surrounding waterways.

Manure will be managed as a beneficial resource and Niman Ranch finishing lots will work with local farmers to ensure the maximum beneficial use of manure for fertilizing nearby farms. Ranches and feedlots must adhere to local EPA and federal restrictions.

Cattle Mud Score

A mud scoring system will be used for cattle in a feedlot situation. It will not be used during the dry months of the year – June through September.

Estimate a mud score for all the animals in each of 5 pens. The estimate is an average of the animals.

1= Clean animals with some mud on feet and ankles.

2= Mud on the legs above the knees. Sides and belly clean.

3= Belly of the animals has mud cakes on them. Sides are clean

4= Belly and sides of body have mud cakes on them.

The first 3 are acceptable, # 4 is not acceptable

Source Verification and Individual Animal Identification System

All cattle entering a Niman Ranch approved feedlot will wear an individual tag that will stay with them until slaughter. These tags will enable the feed lot manager to identify each individual animal. At the time of tagging these animals, all related information must be documented, including color, sex, a code

tracking it back to its source ranch and genetics, information on any vaccinations, and all other individual information that came from the ranch when they arrived.

IV. Processing Facility

Niman Ranch personnel may be present to assist in the handling and data collection of cattle at the processing facility and be a "familiar face" at that facility.

The slaughterhouse must be designed for low-stress movement of cattle and be approved by Niman Ranch for humane handling and processing of cattle.

Plant must adhere to AMI guidelines and include a 3rd party audit.

Cattle should not be able to see other cattle being dismembered.

Whenever appropriate because of travel times, cattle will be delivered to the slaughterhouse the evening before and be allowed to rest. Free choice water will be provided.

Niman Ranch cattle will be segregated at the facility.

The slaughter plant will be USDA inspected and meet all government regulation for the slaughter of cattle for human consumption. After slaughter, carcasses will be handled according to the facility's USDA HAACP plan for Niman Ranch cattle.

No dragging down animals.

Handling of the cattle will be done with utmost care in loading and unloading, as well as moving the cattle.

Definitions

Animal by-products

Includes any mammalian, aquatic or avian tissue, fat, blood, brain, bone, spinal column, feathers, offal, hide, hooves, horns, tallow and/or any other part not listed that is derived from the body parts of another creature.

Therapeutic antibiotics

Antibiotics used to treat illnesses in animals.

Sub-therapeutic antibiotics

Antibiotics that are administered through supplements, feed or water used to increase health, rate of growth, feed efficiency and/or to offset poor husbandry.

Ionophores

Ionophores are listed as antibiotics with the FDA and we honor that listing. Therefore, ionophores would be considered a sub therapeutic antibiotic.

Bad Eye

Advance cancer has invaded tissue around eye

Notice

Niman Ranch reserves the right to modify these protocols at any time to protect the quality of its beef and its cattle. Niman Ranch strongly recommends an aggressive health program that includes

vaccinating against clostridial and respiratory diseases, controlling internal and external parasites and a well balanced vitamin and mineral program that enhances the immune system.

SCHEDULE A

Feeds and feedstuffs permitted in backgrounding and finishing beef for Niman Ranch

For any other feed or feedstuff, contact Niman Ranch personnel for approval.

Alfalfa hay
Alfalfa meal
Alfalfa silage
Almond hulls
Almond hull meal
Barley grain
Barley hay
Beet pulp
Brewers grains
Canola meal
Carrots
Citrus pulp
Corn distillers
Corn grain
Corn gluten
Corn ground high moisture
Corn ground earlage
Corn silage
Corn stalks
Distillers grains
Enzymes
Flax seed
Flax seed meal
Grain
Grain meals
Grain oils
Grape pumice
Grass native/improved
Grass hays Grass silage
Hominy feed
Kelp dried
Kochia
Lactose
Legumes
Legume hays
Legume silage
Linseed meal
Meadow hay
Milo grain
Molasses beet
Molasses cane
Molasses/whey
Non-protein nitrogens
naturally occurring from grains
Oat hay
Oat grain
Oat silage
Orchard grass hay
Pasture-native grass range
Pasture-improved grass range
Pasture-irrigated permanent
Peas
Potatoes (whole only)
Rice bran
Rice hulls
Rice mill run
Rye grass hay
Rye grass pellets
Rye grass silage
Rye grain
Safflower meal
Sorghum grain
Sorghum silage
Soybean hulls
Soybean meal
Soybeans
Sudan grass
Sudan grass hay
Sudan grass silage
Sunflower seed meal
Teff hay
Teff grain
Triticale silage
Vegetable by-products
Vegetable oil
Vegetable proteins
Wheat hay
Wheat grain
Wheat mill run
Wheat middlings
Wheat Straw
Wealage

SCHEDULE B

Vitamins, minerals, essential elements, and supplements permitted in backgrounding and finishing beef for Niman Ranch

For any other vitamins, minerals or essential elements, contact Niman Ranch personnel for approval.

Aspirin BHT Biotin Calcium carbonate Calcium chloride Calcium phosphate Calcium sulfate Chelated forms of: (Zinc) (Manganese) (Copper) (Selenium) (Cobalt) Chlorine Choline chloride Cobalt carbonate Cobalt sulfate Copper oxide Copper chloride Copper sulfate Dextrose Dolomitic limestone Enzymes Flavorings (Natural & Artificial) Florine Folic acid Iodine (EDDI) Iodine (potassium iodate) Iron carbonate Iron oxide Iron (ferrous sulfate) Lactobacillus Lactose Limestone l-Lysine Magnesium carbonate Magnesium sulfate Magnesium oxide Manganous oxide Manganese sulfate Mendadione Mineral oil Molybdenum Niacin Phosphorus (Mono-Dical) Phosphorus (Dicalcium) Potassium sulphate Selenium (Sodium Selenite) Sodium Chloride (Salt) Sulfur Thiamin Vitamins A, B, D3, and E Yeast (live active) Yeast culture Zinc sulphate Zinc oxide Zinc methionine (ZinPro) ZinPro 4-Plex

SCHEDULE C

Niman Ranch recommends a vaccination and prevention program designed to work with your cattle and ranch management program. Please consult your veterinarian when selecting the vaccines that best fit your program and qualifies for ours.

Always read and follow vaccine label directions.

Always use proper injection techniques and administer all injections in front of the shoulder or neck area. Whenever possible, use sub Q labeled products.

Always provide adequate nutrition which includes a vitamin and mineral program that enhances the immune system. Animals should always have access to fresh water and quality forage.

Include vaccinations or management practices that are unique to your operation and/ or are of value to ours. A well planned preventive health program should work to eliminate animal stress. This can also be accomplished by handling livestock quietly and humanely.

Off label drug use must be done with vet approval.

Vaccines permitted for Niman Ranch beef

Calf Hood Vaccinations: Calves should be vaccinated on cows at two to four months of age. Clostridial 8-way IBR, PI3, BVD, BRSV viral vaccine IBR and PI3 should be chemically altered modified live or modified live with veterinarian's approval (Niman Ranch requests that a kill vaccine not be used). BVD and BRSV can be killed or MODIFIED LIVE.

Weaning Vaccinations: We recommend that calves be vaccinated two to four weeks prior to weaning and boostered at weaning. The other option would be to vaccinate at weaning and booster according to the vaccine label instructions.

Vaccinate with the above mentioned vaccines.

It is prohibited to wean calves the same day as they are shipped.

Preconditioning: Cattle need to be preconditioned. If cattle are preconditioned, they must have been weaned 30 to 45 days prior to shipping, have received all calf hood and weaning vaccines and have been administered a parasiticide for the control of internal and external parasites. They have been provided a nutritional base that meets the above criteria.

Yearling Program: Cattle should have received all of the calf hood and weaning vaccinations, parasite control and annual boosters of those vaccines.

Other Approved Vaccinations: Pasteurella Haemolytica and/or Multocida, Haemophilus Somnus, Interanasal Respiratory, Pinkeye, scour prevention and all reproductive vaccines Fusogard (Fusobacterium Necrophorum Bacterin) for the vaccination of healthy cattle six months of age or older as an aid in the reduction of clinical signs of footrot and the number and size of liver abscesses caused by Fusobacterium Necrophorum Tetnas.

If there are other health issues unique to your area, please let us know so we may discuss appropriate and permitted treatments.

Some coccidistats are approved for use – corrid and deccox.

18 "NOs or NEVERs"

of Niman Ranch's backgrounding & finishing program

1 No implants or synthetic growth promotants

No antibiotics of any kind including sub-therapeutic antibiotics. Sick animals are to be treated and removed from the program.

2 No ionophores

3 No untraceable cattle allowed into the program

4 No animal or meat by-products

5 No Vitamin D2

6 No animal tallow, fats, or blood or bone products

7 No put-together or more than one iron, one owner cattle unless approved by Niman Ranch personnel.

8 No cattle with eared or continental breeding

9 No cattle born or raised outside of the United States

10 No cattle will be purchased through an order buyer/ trader without a prior personal interview of the ranch on which the cattle have been raised, and all required Niman documents signed

11 No fed fecal material, garbage, processed food waste or pastures that have been grown with human sewage sludge

12 No Phosmet based pour on products. No Del-Phos Emulsified Liquid, GX-118, Imidian.

13 50 WP, Lintox HD, and Prolate are prohibited.

14 No beta agonists (zilmax, optiflex)

15 No weaning prior to 3 months, unless the health of the cow or calf is in jeopardy.

16 No wattling (brisket mutilation for identification)

17 No ear mutilation (removal of major portions of the ear for identification)

18 No weaning on the trucks of calves

Niman Ranch Beef Cattle Operations
11990 Grant Street, Suite 500 - Northglenn, CO 80233
Fax: (303) 252-9379 - Phone: 252-9313
www.nimanranch.com

CATTLE SUPPLIER AFFIDAVIT

As a supplier of quality feeder cattle to the Niman Ranch beef program, I agree by signing this affidavit that the following management protocols outlined below have been adhered to:

- All animals have been treated humanely, with dignity and respect.
- All cattle and their mothers have been born and raised only in the continental United States
- Cattle are Angus or Angus cross breeds that exhibit at least 51% black hide, no neck humps that exceed 2 inches, and no dairy characteristics.
- Cattle have been managed using sustainable agriculture practices that improve environmental health and economic viability.
- Any cattle receiving treatment with therapeutic antibiotics have been removed from the Niman Ranch program.

Cattle supplied to Niman Ranch are PROHIBITED FROM EVER receiving the following:

- Antibiotics of any kind (all cattle given antibiotics must be tagged as having received them and will not be accepted into the Niman Ranch program)
- Ionophores (examples, but not limited to: Bovatec and Rumensin)
- Growth hormones, supplemental hormones and steroids.
- Feeds or supplements containing any fish, avian, animal or meat by-products such as fish meal, feather meal, and poultry litter. This includes all vitamins, minerals, proteins, and milk replacers.)
- Garbage, fecal material, processed food waste or raised on pastures that have been grown with human sewage waste.

_____
Producer's Signature

_____
Producers Name Printed

_____
Address

_____
City State Zip

_____
Telephone Number

_____
E-mail address

_____
Today's Date

_____
Ranch Name

_____ _____
# of cows Breed(s) of cattle

Type(s) of Marketing (check ones that apply)

◯ Calves sold off Cows ◯ Calves Preconditioned

◯ Yearlings ◯ Finish

Number of head covered by this affidavit: _____

Do you have the ability to give individual birth dates? _____

All cattle covered by this affidavit will be ☐ 30 Months of age or younger at the time of shipping to the feedlot. Please check the box and initial _____ for verification.

Niman Ranch reserves the right to modify these protocols at any time to protect the quality of the product being produced. Niman Ranch strongly recommends an aggressive health program that includes vaccinating against clostridial and respiratory diseases, controlling internal and external parasites and a well balanced vitamin and mineral program that enhances the immune system.

Birth Certification and Country of Origin Documentation

Birth Date(s) of Cattle Covered by this Affidavit: _____ Months _____ Year

Does this affidavit cover all the cattle you will ship to us this year? _____

Location(s) Born and Dates at each Location:

_____ (1) Address/ City/ State
_____ (2) Address/ City/ State

_____ (1) Dates
_____ (2) Dates

Location(s) Weaned and Dates at each Location:

_____ (1) Address/ City/ State
_____ (2) Address/ City/ State

_____ (1) Dates
_____ (2) Dates

Location(s) From Weaning to Marketing and Dates at each Location:

_____ (1) Address
_____ (2) Address
_____ (3)Address

_____ (1) City and State
_____ (2) City and State
_____ (3) City and State

_____ (1) Dates
_____ (2) Dates
_____ (3) Dates

Brand(s): _____ Location(s) _____

Identifying Marks: _____ Ear Tags: _____

Additional Information: _____

OFFICE USE ONLY

Lot #:
# of Head Shipped:
Sex of Animal:
Purchase Weight:
Date of Purchase:
Method of Purchase:
Date Delivered to Feedlot:

Individual ID Start #:
Individual ID End #:

Niman Ranch Hog Protocols

Thank you for your interest in Niman Ranch!

The Niman Ranch Pork Company is one of the fastest growing, most successful niche hog markets around. With over 400 farmers contributing to our success, Niman Ranch Pork has become a nationally-known brand, famous for how the hogs are raised, and how incredible the pork tastes.

If your hogs qualify, you will receive a premium above cash price, and have the protection of an established floor price. Thank you for taking the time to learn about a company that respects your commitment to responsible farming practices.

Qualified Niman Ranch pigs:

- **Have never been given antibiotics of any kind - ever;**
- **Have never been given added hormones or artificial growth promotants - ever;**
- **Have been fed all-vegetarian diets;**
- **Have been raised to the highest care standards, and according to Niman Ranch's Pig Husbandry Protocols;**
- **Are born and raised on American family farms and are harvested and processed at U.S.D.A. inspected facilities within the United States;**
- **And meet our high pork and carcass quality standards.**

Additionally, Niman Ranch Farmers are responsible for:

- **Following Niman Ranch Protocol at all times;**
- **And accurately reporting their market hog numbers to Niman Ranch.**

Please find in this packet of information, the details needed to successfully become a Niman Ranch Farmer.

If you have any questions or concerns, never hesitate to call. We are here to help you out!

The Staff of the Niman Ranch Pork Company

Revised 6-1-09

PO Box 430, Latimer, IA 50452 *phone: 641-579-6594* *fax: 641-579-6139*

1.) Antibiotic free

The hogs that you sell to Niman Ranch can never have been given antibiotics, therapeutically or sub-therapeutically. We realize from time to time that you may have sick hogs that must be treated with antibiotics. This is fine. However, we require that you mark the treated pigs, or separate them off, and sell them through another market. We also require that you keep a record of your treated pigs. You may use the "Antibiotic Treatment Form" located on the final page of this document.

2.) Artificial hormone or growth promotant free

While we know that using hormones for growth promotion is more common in the cattle industry, we also require that you do not use growth promotants such as ractopomine.

3.) Meat and meat by-product free

Meat and meat by-products include animal fat, meat and bone meal, fishmeal, tankage, blood or plasma, etc. This excludes milk products and egg which are allowed. A Niman Ranch staff member must look over and approve all of your rations and feed tags. Additionally these items must be filed with the USDA before Niman Ranch can buy any of your hogs. Niman Ranch periodically takes random feed samples to test for the presence of meat by-products and antibiotics. We encourage farmers to continually check labels and rations to insure compliance. Feed companies may change ingredients without prior notice.

4.) Niman Ranch Pig Husbandry Protocols & Dr. Temple Grandin Certified Humane and Sustainable

A complete version of *Niman Ranch's Pig Husbandry Protocols* begins on page 6. Before a farmer ever sells hogs to Niman Ranch, their farm must be audited to ensure that he or she is complying with these rules. Following this, a Niman Ranch staff member will continue to audit each farm one or more times each year and farmers will be expected to complete self reviews. Additionally, Niman Ranch is certified by Dr. Temple Grandin. A portion of all Niman Ranch farms will be audited by Dr. Grandin's staff annually. All audits are mandatory.

5.) Pork quality acceptance

Only farmers who raise the highest quality pork will be accepted into the Niman Ranch program.

Qualified pigs must be sired by NR approved boar lines. Additionally, farmers must be committed to using top-quality genetic lines, preferably a three-way rotational cross consisting of **Duroc**, **Berkshire**, and **Chester White** genetics. A list of approved boar lines can be obtained from NR field agents. If gilts are purchased from existing Niman Ranch Farmers, the farmer selling gilts must be ranked in the top 3/5 of our pork quality rankings.

Farmers that are not utilizing Niman Ranch approved genetics must adhere to the following: 1.) NR Field Agent must assess the farmer's current genetics based on visual appearance and slaughter data. 2.) Niman Ranch purchases up to ten market hogs based on the Field Agent's evaluation. 3.) Meat samples will be taken and quality testing performed from hogs in this group. 4.) Niman Ranch's continued relationship with the farmer will be based on the results of the testing. A farmer will not be accepted into the Niman Ranch system until all steps are completed. The process could take up to four weeks.

Our general pork quality targets are:

Loin Eye Area: 5.5 to 7.5 square inches
Color Score: 3 to 4
Backfat: 0.8 – 1.1 inches
Marbling Score: 3 to 5
Percent Lean: 47 – 51 %
pH: 5.7 and above

Niman Ranch will continue to monitor the quality of the pork farmers raise. We currently work with meat scientists at Iowa State University who evaluate our farmers' pork weekly. Below standard quality may result in low priority for selling hogs as well as suspension from the program.

6.) Needles and Injection Requirements

Niman Ranch allows zero tolerance for retained needles found in our hogs. We will not purchase pigs from farmers who refuse to follow our injection protocols:

A.) Intramuscular injections must always be given in the neck muscles, behind and below the ear, but well ahead of the shoulder. Subcutaneous injections (under the skin) should be given in the same location. In baby pigs, subcutaneous injections may also be given in the loose flaps of skin in the flank or elbow region;

B.) Whenever possible, "highly detectable" needles must be used (please contact Niman Ranch for details on purchasing);

C.) Needles must be inspected between each injection. **Injections must be administered in a way that allows the farmer to identify pigs that may have retained a needle;**

D.) If you suspect a needle has been retained in a pig, Niman Ranch may still purchase the pig if the following procedures are followed. [Note: The farmer will not receive a discount for this pig, but weight of the carcass may be reduced should excess trimming be needed]:

1.) Affected pig is permanently identified (ear tag, ear notch, ear punch);
2.) Incident is documented in writing by the farmer, noting date, method in which the pig is ID'd, approximate location of the needle (ie: neck, left side), and size/type of needle retained;
3.) At time of sale, farmer notifies NR that affected pig will be arriving. Farmer must also notify their trucker (or Sioux Preme staff if it is a direct haul);
4.) If the pig cannot be individually identified, steps 2-3 must still be followed, and the suspect pigs may be sold in groups of no more than 20 head at a time. These carcasses will be individually inspected.

7.) Field Agents

Niman Ranch employs several Field Agents who work closely with their assigned group of farmers. The duties of the field agents are to audit farms, work with farmers on record-keeping and market hog inventory projections, recruit new farmers, and assist producers with technical information. If you have not been contacted by a field agent, please call the office immediately and we will help you make contact with your field agent.

8.) Pork quality testing and bonuses

Once you begin selling pigs to Niman Ranch, we will continue to monitor the quality of the pork you raise. We currently work with meat scientists at Iowa State University who evaluate our farmers' pork weekly. With this information, we are able to determine which farmers are raising the highest quality pork for Niman Ranch. Annual bonuses are paid to farmers based on this information.

9.) Other Audits

Your farm will be audited once or twice each year by your Field Agent or another Niman Ranch Staff Member and may be audited by the representatives of Dr. Temple Grandin. The purpose is to ensure that our farmers are following all of our required protocols. Niman Ranch reserves the right to have other third party auditors inspect your farm. From time to time, some of our customers may request to audit your farm. All audits are a mandatory requirement for selling into the program.

10.) Reporting hog numbers and working with the Shipping Manager

When you commit to raising pigs for Niman Ranch, you will start receiving a Monthly Producer Report. This report is sent to you at the end of each month and asks for the following month's delivery plans as well as a 6-month projection of hogs you will have available to sell. Company sales are based on forecasted projections, so reporting timely and accurate hog numbers is an important task you will be asked to do as a Niman Ranch farmer. There are two ways to report your information:

Shipping Manager - Some regions use a Shipping Manager as an information collector and delivery coordinator for the farmers in their group. If you live near the following areas, you will be able to ship your pigs with other farmers in that area. Please inquire for further details.

- Charles City, IA
- Leroy, MN
- Meservey, IA
- Western Illinois
- Eastern Iowa
- Southeast Iowa (Sigourney, Knoxville area)
- Southwest Iowa (Red Oak, New Market area)
- Missouri (Jamesport, LaPlata, Windsor, Versailles)
- Michigan
- Nebraska

Niman Ranch office - If you live in an area outside of those listed, you will need to coordinate all delivery plans through the Niman Ranch Pork Company office in Thornton, IA. Delivery plans must be confirmed the week prior to actual delivery.

REPORTING HOG NUMBERS IS CRUCIAL! If you do not accurately do this, we cannot guarantee that we will buy your pigs!

11.) Standards of conduct

All Farmers in our program agree to remain committed to a cooperative and communicative professional relationship with our Field Agents. Mutual respect, honesty and integrity are words that exemplify the relationship between you and your Niman Ranch Field Agent. We are committed to providing an environment for our Farmers and our Field Agents that is free of abusive or threatening language, and facilitates the required processes of accurate auditing and protocol compliance. Further, Niman Ranch and Farmers agree not to use any proprietary information relating to the business of Niman Ranch in competition with or to the detriment of each other.

12.) Proprietary information and confidentiality

Niman Ranch owns all the rights in and for trade secrets and proprietary information associated with our protocols. Farmers may not have or acquire license to use any such work for any purpose other than for the benefit of the relationship with Niman Ranch. All memoranda, notes and records and other documents created, developed or compiled or used by Farmers or made available to Farmers in connection with Niman Ranch and during the term or the relationship with Niman Ranch is and shall be the property of Niman Ranch. Confidential information means any and all portfolio data, proprietary information, Farmers in network, production information, husbandry practices, herd health resources and genetic data. This provides mutual protection to both Niman Ranch and you, the Farmer.

13.) Trucking allowance

Niman Ranch agrees to pay a trucking allowance for *Niman Ranch approved hogs* to the packing plants. All qualified producers who have been booked and approved for delivery will be paid a trucking and yardage allowance based on their miles to the kill facility, weight shipped (calculated on either your carcass or live weight depending on your kill facility) and number of head shipped. Niman Ranch will calculate mileage on mapquest.com by using the farmer's home address (submitted on the Quality Standard Affidavit) as the starting point, and the kill facility's address as the ending point. When P.O. Box numbers are used, a home address must be submitted as well. When addresses do not register on mapquest.com (rural routes, for example), the farmer's 5-digit zip code will be used instead. Your trucking allowance will be added to your check.

For example: To calculate your trucking allowance you multiply the distance you live from the kill facility, by the total number of lbs dressed you delivered, by $.00008505 (this is the cost per pound per loaded mile, calculated by using a basis of $3.00 a loaded mile, with a full load being 180/hd, and dressed yields being 196 lbs), then you add a yardage allowance of $.50/hd to derive your total allowance.

i.e.: If you live 175 miles from the kill facility and you deliver 50 head that weighed 9843.50 lbs. dressed, you will be paid $.00008505 per lbs dressed/per mile, plus a yardage allowance of $.50/hd for a total allowance of $171.51, which equals $1.74/cwt dressed and $3.43/hd.

175 miles x 9843.50 lbs x .00008505	146.51
50 head x $0.50	25.00
Total Trucking allowance paid	$171.51

14.) No Show/Cancellation Policy:

Farmers who have confirmed delivery of Niman Ranch approved hogs may be liable for the shipping expense of those hogs if they fail to deliver at the specified time and location without proper notification.

Cancellations: Farmers may cancel their hog delivery by noon the Friday prior to the scheduled delivery time from their loading location without penalty. Cancellations must be made through the appropriate source by contacting the Shipping Manager, Field Agent, or Niman Ranch Procurement Manager.

No Shows: Farmers who have a confirmed scheduled delivery and do not deliver the pigs as directed may be liable for their portion of the trucking expense based on the number of pigs they were scheduled to deliver.

15.) Responsible farming practices

Niman Ranch expects certified farmers to raise hogs in an environmentally safe and approved manner that adheres to all county, state, and federal standards. This includes, but is not limited to manure management practices, stocking densities, and disposal of mortality.

16.) Frequently Asked Questions

Q. Is Niman Ranch still looking for new farmers?
A: Yes. We have grown 15-35 % annually since 1999. There is always room for new farmers. However, new farmers need to consider winter farrowing very seriously. We traditionally suffer shortages in hog supply in the summer months, usually June and July. Fall remains to be the season when we have an oversupply of hogs.

Q. Is Niman Ranch going to buy all of my pigs?
A. Raising pigs by these methods traditionally has seasonal ups and down. Commonly, we suffer summer supply shortages. Other times, we may have excess supply. When we have an oversupply of hogs, preference is given to those with accurate projections and greater meat quality. Trucking limitations also play a role.

Q. Where are the hogs harvested?
A. Currently, in Northwest Iowa.

Q. At what weight should I be selling you hogs?
A. We are asking for pigs with a carcass weight of 179-220 lbs. (approximately 244-299 lbs. live). Ideal carcasses gaining the most premium are 190-205 lbs. (approximately 259-279 lbs. live), and 47-51% lean. Light and heavy pigs will be discounted. It is the farmer's responsibility to sell heavy hogs elsewhere if Niman Ranch does not buy them.

Q Do I get any premiums for leanness?
A. NO!! Hogs that are too lean produce tough, dry, tasteless pork. We prefer hogs 47-51% lean and pay an extra premium for that. Hogs that are extremely lean or fat will be discounted. Please see the pricing grid on pg 3.

Q. Can I deworm and vaccinate?
A. Yes.

Q. Can I buy feeder pigs?
A. We have a few farmers that buy or sell feeder pigs. We keep an updated list in our office of who has feeder pigs, as well as breeding stock, for sale.

Q: Are there any herd size limitations?
A: We request that new farmers breed either 20 sows to farrow 2 times per year, or 30 sows to farrow once per year from November 15 to February 15. Feeder pig finishers must finish at least 100 hogs per year. These restrictions can be put aside at the discretion of the Niman Ranch Field Operations Manager and the Livestock Program Manager in the case where a new producer would be joining an existing community or group.

Niman Ranch Pig Husbandry Protocols

6-1-09

1. ENVIRONMENT

1.1 General Standards of a Good Environment

1.1.1) Pigs must be raised on pasture or bedded pens. To qualify as pasture, 75% or more of the land occupied by livestock in this program must have vegetation with a root system. If hogs do not have continuous access to pasture, then clean, dry bedding shall be provided in quantities sufficient to give the hogs material in which to play, forage, explore and root and build nests during farrowing. Sufficient bedding material must be provided to prevent transfer of manure and other soil onto the animals so that they remain clean on the belly. For additional bedding requirements, see section 1.2.

1.1.2) There must always be a dry area where all animals can lay down at the same time without becoming soiled on the belly.

1.1.3) Provisions must be taken to protect animals from regional climate extremes. Sufficient shelter must be provided so that all hogs can lie down at the same time without being on top of each other while being protected from snow, rain or sun. If necessary, wallows and/or sprinklers must be provided in hot weather.

1.1.4) Close confinement where an animal is not allowed to walk or turn around will only be allowed temporarily for necessary procedures. This includes, but is not limited to: vaccinations or veterinary care, artificial insemination, feeding stalls, etc. For additional details on space requirements, see section 1.3.

1.1.5) Only breeds or genetics suitable for thriving in outdoor production systems shall be allowed.

1.1.6) Practices must be implemented that prevent soil loss or degradation in production areas, minimizes unacceptable or unintended poor air quality for family, workers, and neighbors, and prevents water quality degradation of surface and groundwater resources.

1.1.7) Certified farmers and ranchers must raise animals in a manner that protects or enhances the quality of the environment, animal health and public health. This includes, but is not limited to manure management practices, stocking densities, and methods for disposal of mortalities, which must meet all county, state and federal standards

1.2. Bedding Requirements

1.2.2.) Bedding must be clean, dry, safe, and allow pigs to play forage, explore, root, and chew. Straw and corn stover are the preferred choices.

1.2.3.) Even if pigs have access to pasture or dirt, adequate bedding shall be provided in shelters to keep pigs comfortable in wet conditions and when temperatures fall below 60-degrees Fahrenheit.

1.2.4.) Sows, whether farrowing indoors or outdoors, must have ample bedding and be able to pick it up in her mouth, and manipulate it to build a nest. In farrowing facilities, straw is the preferred choice of bedding.

1.2.5.) Pigs may be raised loose-housed in groups in deep-bedded systems in which composting can start and be sustained to provide warmth and destroy pathogens. A hoop building is an example of a loose-housed structure. The minimum bedding pack depth recommended in a deep bedded system is **12 inches**. A clean layer of straw should cover the composting mass in the lying area.

1.2.6.) Minimum bedding depth in non-deep bedded systems, without pasture, is:

- 1.2.6.1.) 39° F and below*: **8 inches**
- 1.2.6.2.) 40-59 ° F*: **6 inches**
- 1.2.6.3.) 60 ° F and above*: **2 inches**

* Temperature shall be a daily average temperature measured inside the shelter.

1.3.) Housing and Space Requirements

1.3.1.) Sufficient shelter must be provided so that all hogs can lie down at the same time without being on top of each other while being protected from snow, rain or sun.

1.3.2.) New buildings shall be constructed with windows, white translucent skylights, or openings that allow daylight into the building allowing the animals indoors to experience natural light patterns. As a guideline on this matter, the natural light available shall be such that a human can read a newspaper in the central part of the pig's living area.

1.3.3.) Air quality, including ammonia levels inside buildings, must at all times enable animals to breathe comfortably. It must not pose a risk of injury or health problems in animals or their caretakers. Ammonia levels are to be tested and have a measured result of no greater than 25ppm. Levels below 10ppm are the goal.

1.3.4.) Facilities with totally slatted or perforated flooring without bedding are prohibited. Each animal's square footage requirements must be met on solid flooring.

1.3.5.) Gestation

1.3.5.1.) Space Requirements. Sows and gilts must all be able to lie down in the bedded area on their sides comfortably with legs extended and without being on top of each other, and move about freely. For an adult sow, 16 sq. ft. of bedded lying area, with 35 sq. ft. total recommended.

1.3.5.2.) Social Management: A stable social environment must be maintained amongst sows and gilts to limit aggression, competition, and bullying. It is recommended that a single sow or gilt should never be introduced into an established social group. Five or more sows or gilts should be introduced into an established social group at a time.

1.3.5.3.) Gestation stalls and tethers are prohibited.

1.3.6.) Boars

1.3.6.1.) **Space Requirements**: Boars must all be able to lie down in the bedded lying area on their sides comfortably with legs extended and without being on top of each other, and move about freely with freedom from aggression and competition. When not grouped with sows, 64 sq. ft. is recommended per boar.

1.3.6.2.) **Isolation:** Isolation of boars from other hogs is prohibited. Exception will be made for quarantining new boars entering the farm for disease security

1.3.7.) Farrowing and Lactation

1.3.7.1.) Sows must be given the opportunity to care for, interact with, and nurture their young

1.3.7.2.) In all farrowing facilities, the sow must be able to build a nest, turn around and move about easily and freely. Sow and litter must be able to lie down on their sides comfortably with legs extended and without being on top of each other.

1.3.7.3.) **Pens:** A farrowing pen is defined as a fenced in enclosure within a building in which the sow and litter are housed alone. If farrowing in a pen, pen size will be determined by the size of the sow and litter. Recommended pen size for a 450 lb sow and litter is 64 square feet.

1.3.7.3.1.) If the available area is less than 64 sq. ft, we recommend converting the pen into a free stall or giving the sow access to an exercise area at least two times each day (in approximate equal time increments) for a minimum of one hour during each exercise period.
1.3.7.3.2.) If sow and litter are housed in pens, it is recommended to put them into group lactation by the time pigs are three weeks of age.

1.3.7.4.) **Free Stalls and Huts**: A free stall is defined as a pen with an opening, allowing the sow and litter to move about outside or into a communal loafing area at free will. Free-stall and hut size will be determined by the size of the sow. Recommended free-stall or hut size for a 450 lb sow with litter is 33 square feet or larger.

1.3.7.4.1.) Circumstances may arise where it is best for the sow and/or litter to be restricted to the free stall or hut. If the free stall or hut is not at least 64 square feet in area, it is recommended that the sow is able to the leave free stall after 72 hours, and piglets after 10 days of age.

1.3.7.5.) **Group Lactation**: In a group (loose) lactation setting, 81 square feet per sow and litter is recommended.

1.3.7.6.) Farrowing crates, where a sow cannot turn around, are prohibited.

1.3.8.) Growing and Finishing Hogs

1.3.8.1.) In bedded lying area, all hogs must all be able to lie down on their sides comfortably with legs extended and without being on top of each other, and move about freely.

1.3.8.2.) Requirements for pigs with outdoor access:
- 1.3.7.2.1.) For weaned hogs less than 60 lbs: **8 sq. ft.** total per hog required
- 1.3.8.2.2.) 60-120 lbs: **12 sq. ft**. total per hog required.
- 1.3.8.2.3.) 120-180 lbs: **15 sq. ft**. total per hog required.
- 1.3.8.2.4.) 180 lbs to market: **18 sq. ft**. total per hog required.

1.3.8.3.) Requirements for pigs that are loose housed (like hoop buildings), without outdoor access:
- 1.3.8.3.1.) For weaned hogs less than 60 lbs: **5 sq. ft.** total per hog required
- 1.3.8.3.2.) 60-120 lbs: **10 sq. ft**. total per hog required.
- 1.3.8.3.3.) 120 to market: **14 sq. ft**. total per hog required

1.3.9.) In an effort to promote outdoor access, any new construction must permit outdoor access for all hogs, except for piglets below sixty pounds and lactating sows. Structures with large openings on the end to let in sunlight which all pigs can avail themselves of on a daily basis (like hoop buildings, for example), weather permitting, and with deep litter composting are excluded from this requirement.

Access to pasture or fields, particularly for the breeding herd, and especially from spring through fall, are recommended.

2. FEED AND WATER

2.1) All hogs must be fed a 100% vegetarian diet. The feeding of animal flesh is prohibited. This includes, but is not limited to meat, bone meal, blood meal, animal fat, and fishmeal. Dairy and egg products are permitted.

2.2) All hogs must have a feeding plan that will guarantee a sufficient, well-balanced diet to appropriately meet their nutritional needs at their stage in life and maintain required Body Condition Scores. Animals shall have access to their feed as long as is necessary for them to satisfy their nutrient requirements.

2.3) Feed stuffs shall be of good quality and free from contaminants such as rodent droppings, mold, and other potentially unsafe substances. Care should be taken to keep feed storage rodent-free.

2.4) Food shall be provided daily and in a way that minimizes competition. Wound scores shall be collected to gauge competition.

2.5) As a guideline, 5 to 7.5 market pigs per feeder hole is recommended, with a maximum of 10 allowed.

2.6) Sows and boars that are limit-fed to prevent obesity shall be provided continuous access to clean hay or similar fiber source to satisfy hunger between meals and to allow the animals to engage in food-search activity.

2.7) All hogs shall have free access to clean drinking water with minimal competition. As a guideline, 30 market pigs/water hole is recommended, with no more than 50 pigs/water hole allowed

2.8) If a sow and litter are housed within a pen that does not have a constant supply of drinking water, then she must be given access to drinking water at least two times each day (in approximate equal time increments) for a minimum of one hour during each drinking period.

2.9) The average weaning age of piglets shall be no less than 5 weeks, with no litters less than 4 weeks of age.

2.10) Piglets must have dry feed available to them at least one week prior to weaning.

2.11) Sows must be in condition 2.5 to 4 prior to farrowing, and must maintain a condition score of at least 2 until piglets are weaned. Body condition scores shall be collected by auditors.

3. HYGIENE AND SAFETY

3.1) Every effort must be made to limit lameness. This includes, but is not limited to, genetic selection, facility design and maintenance.

3.1.1.) Lameness scores of 1 and 2 are acceptable. Only 5% or less of the herd may be observed with scores of 3 or greater.

3.2) The animals' living quarters shall be cleaned by procedures that ensure satisfactory hygiene. The surfaces of deep litter beds shall be kept dry and be of good hygienic quality.

3.3) Every effort must be made to correct floors that could become slippery, with particular attention paid to breeding areas.

3.4) A fire plan must be established. In indoor housing, escape routes to the outdoors must be available from interior pens. A method to extinguish the fire (fire extinguisher, water source) must be accessible. As fire prevention measures, electrical wiring must be protected from pigs. Heat lamps shall be placed in a way that pigs cannot disturb them.

3.5) If predators pose a risk, every effort must be made to protect pigs from predators though means that are not injurious or lethal to the predator. Exclusion of predators should be the primary means of control. If predation cannot be resolved in this way, the method of control must be one that causes immediate unconsciousness and death. Poisons, leg hold traps or any other method that cause animals to suffer are prohibited. Methods of predator control must specifically target the individual animal(s) causing the problem.

3.6) In the event a pig suffers accidental injury on the farm, the animal shall receive immediate individual treatment to minimize pain and suffering, including veterinary treatment, if the farmer cannot provide immediate relief.

3.7) A safe place must be provided for sick or injured animals to recover, free of competition.

3.8) If the injury is serious enough for the animal to be euthanized, the animal shall be promptly and humanely euthanized on the farm. Acceptable methods include:

3.8.1.) Nursing piglets: (<12 lb): Blunt trauma, anesthetic overdose, CO_2
3.8.2.) Nursery (12-70 lb): gunshot, penetrating captive bolt, anesthetic overdose, CO_2
3.8.3.) Grow/Finish (70-300 lb): gunshot, penetrating captive bolt, anesthetic overdose, CO_2
3.8.4.) Sows, boars: gunshot, penetrating captive bolt, anesthetic overdose, CO_2

4. ANTIBIOTICS AND OTHER TREATMENTS

4.1) Non-therapeutic use of antibiotics or sulfas to control or mask disease or promote growth is prohibited. Animals that have been administered antibiotics may not be marketed to Niman Ranch. Additionally, growth-promoting hormones and beta-agonists, ionophores, and carbadox are prohibited.

4.2) Animals that are sick or injured will be tended to and given immediate care to ensure reduced suffering, and/or mortality and lack of possible pathogen transmission. Antibiotics must be administered to individual animals to treat disease if necessary, even though it will disqualify them from the program. Animal welfare is top priority of our producers and they will be suspended or be de-listed for failure to treat sick animals.

4.3) Pigs that have been administered antibiotics or any other prohibited substance must be marked and/or segregated in some fashion to identify them as ineligible for this program. We suggest marking individual animals with an ear tag, and entire groups may be marked with a sign hung on their pen. Treated animals must be recorded.

4.4) An animal that cannot recover without prolonged or acute suffering must be treated or humanely euthanized.

4.5) Routine use of hormones to induce farrowing is prohibited. In the case of dystocia a one-time administration of hormones is permitted to ease farrowing.

4.6) Parasites must be effectively managed. Regular pasture rotations and proper bedding management and removal should be the primary method of preventing parasitical infestations. In cases where prevention has not been effective, medicinal regimens must be implemented to effectively control worms, lice, and mange.

4.7.) Organophosphates may not be used to control parasites, however, other pharmalogical agents are allowed.

5. PROCEDURES AND ALTERATIONS

5.1.) Procedures and alterations to animals should be limited as much as possible, unless necessary to maintain animal health and comfort as well as maintain sustainability of the water and the land.

5.1.2.) Routine needle teeth clipping and grinding/filing is not allowed. On the rare occasion that piglets are causing injury to one another, grinding/filing is allowed.

5.1.3.) Tail docking is prohibited. If tail-biting problems do arise, farmers must identify and eliminate the cause rather than resort to tail-docking.

5.1.4.) Boar tusks may not be removed by blunt force or with bolt cutters. This does not prohibit trimming, which may be done with a surgical wire by a trained individual, and only as needed.

5.1.5.) If piglets are to be castrated, the process must be undertaken before the piglets reach 2 weeks of age by a person proficient in the procedure.

5.1.6.) Nose-rings may be used on breeding stock, if given access to pasture. Market hogs may be rung if they are given access to pasture from at least weaning to market. The use of one septum ring is preferred, but because nose rings for pigs are not readily accessible nation-wide, rings on the ridge of the nose are permitted. No more than two rings are allowed at any one time.

5.1.7) Ear notching must be performed with an ear-notcher, or a tool designed specifically for this purpose. Knife blades will not be allowed for ear-notching.

6. HANDLING AND TRANSPORT

6.1.) Strict regulations will be followed regarding handling and transport. Audits will be performed at packing plants to watch truckers unload and check for downers, frostbite, and signs of abuse. Additionally, packing plants slaughtering animals raised under Niman Ranch's certified program must undergo annual husbandry audits to verify their compliance with AMI guidelines.

6.1.1.) Electric prods are not permitted.

6.1.2.) During cold weather, bedding (straw preferred) must be provided when temperature falls below 60 degrees F. Steps are taken (trailer openings are suitably boarded up) to protect animals from wind chill, freezing rain, etc.

6.1.3.) During hot weather, hogs are loaded and unloaded promptly (no unnecessary stops along the way). Trailers are kept well ventilated. If the temperature is above 80 degrees F, hogs are sprinkled with water before loading or the truck must have a built-in sprinkler system.

6.1.4.) During winter months, pigs are provided with 4.26 sq. ft. of space each (250 lb. pig), and 5.0 sq. ft. during the summer months. All pigs must be able to lie down during transport without crowding.

6.1.5.) Hogs from different farms or social groups (pens) are separated when possible.

6.1.6). Persons who move and/or transport live animals shall attend to the animals' needs and take the necessary steps to ensure that the animals are not injured or caused to suffer during loading, transport and unloading.

6.1.7). Non-ambulatory, sick or injured animals or animals who for any reason could have difficulty withstanding the rigors of transport may not be transported, unless to receive veterinary treatment.

6.1.8.) Farmers are responsible for selecting responsible and humane-minded handlers and truckers who will adhere to all of Niman Ranch's requirements and prohibitions during loading, transport and unloading at the destination. Additionally, hired truckers must maintain TQA (Trucker Quality Assurance) Certification.

7. TYPE OF FARM

7.1.) Each farm shall be a family farm or ranch, that is, a farm or ranch on which a family or individual owns and makes on site management decisions regarding the animals and the operation.

7.2) The family farm requirement shall not prohibit networking among family farmers as long as all criteria listed herein are adhered to by every member of the network. This includes farmers who raise feeder pigs; these pigs must be obtained from a family farmer who meets all of the requirements.

7.3) Any farmer or rancher who intends to simultaneously maintain a system that does not meet the Niman Ranch standards while marketing livestock from a fully compliant portion will be prohibited. This does not exclude farmers or ranchers who are committed to transitioning to a fully-compliant farm or ranch within 24 months and have a written and approved transition plan. Specific protocols required for transitioning a non-compliant nursery can be found in *Addendum 1.0: Transition Guidelines for Non-Complaint Nurseries*. If at any time on a transitioning farm both compliant and non-compliant animals exist, the non-compliant animals must be marked and segregated.

7.4) Niman Ranch reserves the right to purchase livestock from farmers who do not meet the "family farmer or rancher" definition (7.1) or who simultaneously maintain a system that does not meet the Niman Ranch standards while marketing livestock from a fully compliant portion (7.3) if necessary to sustain the market. We understand that from time to time this may be necessary to keep the markets that hundreds of family farmers depend upon for their livelihood financially viable. When these situations arise, the "Dr. Grandin" staff must be given substantiating evidence to support the decision and must give final approval.

7.5) Pigs that do not fully meet the Niman Ranch protocols may be purchased if the deviation occurred prior to the farmer committing to the Niman Ranch program. The following deviations allowed include, but are not limited to:

7.5.1.) Pigs with docked tails may be purchased if the farmer discontinued this practice immediately after committing to Niman Ranch;
7.5.2.) Pigs with clipped or ground teeth may be purchased if the farmer discontinued this practice immediately after committing to Niman Ranch;
7.5.3.) Pigs that have been weaned prior to five weeks of age may be purchased if the farmer discontinued this practice immediately after committing to Niman Ranch;

7.6) Even if a farmer has an approved transition plan, Niman Ranch may not purchase pigs that deviate from the following protocols. This includes, but is not limited to:

7.6.1.) The non-therapeutic use of antibiotics to control or mask disease or promote growth is prohibited. Animals administered antibiotics for treatment purposes may not be purchased and must always be marked and/or segregated;
7.6.2.) Growth-promoting hormones, beta-agonists, ionophores, and carbadox are prohibited;
7.6.3.) Organophosphates to control parasites are prohibited;
7.6.4.) Gestation crates or tethers are prohibited;
7.6.5.) Farrowing crates are prohibited;
7.6.6.) Feeding of animal flesh is prohibited. This includes, but is not limited to meat, bone meal, blood meal, animal fat, and fishmeal;
7.6.7.) There must always be a dry area where all animals can lay down at the same time without becoming soiled on the belly;
7.6.8.) Animals that are sick or injured will be tended to and given immediate care to ensure reduced suffering, and/or mortality and lack of possible pathogen transmission. Antibiotics must be administered to individual animals to treat disease if necessary, even though it will disqualify them from the program.
7.6.9.) Facilities with totally slatted or perforated flooring are prohibited. This does not exclude facilities where slatted or perforated flooring are covered to create a solid surface.

7.7) If a youth in the household of a Niman Ranch farmer are to raise pigs as 4-H or FFA projects, pigs must not deviate from protocols with the possible exception of the feeding program and genetics. Pigs may also be purchased from non-certified farms. However, if pigs do not fully adhere to Niman Ranch standards they may not be sold to Niman Ranch and must marked and/or segregated in some fashion to identify them as ineligible for this program. We suggest marking individual animals with an ear tag, and entire groups may be marked with a sign hung on their pen. Non-qualified animals must be recorded. If feeding program varies from Niman Ranch's guidelines, feed must be marked and stored in a different location from approved feed to avoid any possible chance of contamination.

7.8) Temporary deviations, when unexpected circumstances arise that are not under the control of the farmer, will be taken into consideration upon request of the farmer. Documentation of deviations must be kept on file.

Checklist for Potential Niman Ranch Farmers

Before you can sell hogs to Niman Ranch for the first time, you must do the following:

☐ Contact your Field Agent.

☐ Report your market hog inventory to your Field Agent as directed.

☐ Have pork quality approved by Niman Ranch staff.

☐ Gather copies of your feeding formulas (rations) and feed labels from **all** premixes, concentrates, additives, etc. Your Field Agent will need to collect and file this information in order to complete the paperwork necessary to certify you. **Labels must show ingredients!!** Niman Ranch needs this information at least one month prior to buying the hogs, however **it is recommended that farmers turn in the feed information before any hogs even eat the ration.** It is best to be confident that the feed doesn't contain any unapproved ingredients that could disqualify the hogs.

☐ Begin keeping simple herd health records. If you have to treat any hogs with antibiotics, please identify them (see #1, page 2) and record them. Your Field Agent will also need to document your vaccination program as well as parasite control program, so have that information available.

☐ Arrange to have your farm inspected by your Field Agent to verify Husbandry standards. **We prefer to visit farms when you are farrowing.** Do not delay. Visits must be arranged several weeks in advance and we cannot take your hogs before an inspection is done.

☐ Contact your Shipping Manager to schedule your market hog deliveries. It is recommended that this is done at least one month in advance.

ANTIBIOTIC TREATMENT RECORD

For pigs ineligible for Niman Ranch program*

Name:_____

Date	# hd	Reason for treatment	Antibiotic used	Method of identification (tag, ear notch #)	Pen location	Comments (where sold, etc.)

** Please include sows and replacement gilts*

NIMAN RANCH LAMB PROTOCOLS

Our Mission

The mission of Niman Ranch is to produce and market the best-tasting lamb in the world, by adhering to a strict code of husbandry principles and practices. Niman Ranch livestock must be humanely treated, fed the finest feeds, never given growth hormones or antibiotics, and raised on land that is cared for as a sustainable resource.

Niman Ranch lamb is:

ALL NATURAL*

Raised with:

No Antibiotics Ever

No Added Hormones Ever

All Vegetarian Feeds

Humanely Raised on Environmentally Sustainable Family Ranches

*minimally processed – no artificial ingredients or preservatives

Lamb Rancher Requirements

Each ranch shall be a family ranch on which an individual or family member (a) owns the lambs; (b) depends upon the ranch for his or her livelihood; (c) provides a major part of the daily labor to manage the lambs and ranch operation. This shall not prohibit networking among family ranches as long as every member within the network adheres to all criteria listed herein.

General Husbandry

Feeds:

No feed containing animal proteins are permitted, with the exception of milk products. Lambs shall never be given any form of growth-promoting hormones, steroids, or antibiotics. Lambs should be consistently fed feed and forage with adequate concentrations of fiber to allow for proper rumination.

Animals should not be kept for longer than 24 hours in nutrient deficient environments (ie: in holding pens).

Troughs and pens must be kept clean and stale feed should be removed to ensure satisfactory hygiene and comfort.

Animals must always have access to a constant and adequate supply of clean, fresh drinking water.

Housing:
Housed or sheltered pasture lambs must be provided with dry beds and the appropriate environment to control temperature and allow for adequate ventilation. Particularly during the summer, lambs must be protected from heat stresses (ie: presence of sheep/goat salt mineral mix lick near water). Housing should also include adequate lighting and access to the outdoors. When climatic conditions allow, animals must have access to grazing pasture.

Lambs should at all times be allowed free movement and maximum expression of natural behavior. Ranch corrals, sorting chutes, and barns should be designed to account for the behavioral traits of sheep and should eliminate any risk of injury or harm to the health of the lambs.

Handling:
Basic behavioral characteristics should be observed when handling or moving groups of sheep. Animal handlers must be trained and understand the stress factors that sheep experience.

Because sheep are herding animals, various tools are needed to maintain fluid movement of the stock. Facility design and location is the primary tool to fluid sheep movement (the location of the sun in regards to sheep movement in the corral can restrict fluid movement). Handling systems, gates and alleys should be designed to minimize undue stress, injury or suffering to the animals and do not impeded flock movement.

Time of day is critically important when handling sheep. In the summer months, sheep are worked very early in the morning to minimize heat and dust stress. In the winter months, sheep are normally worked when weather is not adverse.

Dogs used for herding and as guard dogs must be properly trained and must be kept under control at all times. Electric prods are not permitted; plastic paddles, blunt PVC plastic pipe, blunt wooden canes or sticks can be used as benign handling tools to help initiate movement and handling of sheep. These tools are not used to strike the animal, but used only on the body of the animal whereby minimal contact will encourage desired movement and prevent harm or bruising.

Health Management:

The observation of normal animal behavior and animal body conditions are critically important to help manage and control health problems in sheep. Sheep herders must be trained to identify the difference between normal sheep behavior and abnormal behavior. Normal animal behavior includes how they feed, how they interact with other sheep in their herd, if they appear stress based on their reactions and how they travel in the pasture. Sheep herders must be trained to identify the difference between the normal body condition for the herd of sheep and sheep that are loosing body condition. The loss of body condition is a sign that the sheep is for some reason not eating based on either sickness or stress. Astute observations can minimize the management

of heath problems by identifying health problems in the early stages and will help reduce the use of antibiotics in the treatment of sick animals.

The routine use of sub-therapeutic antibiotics or feed additives to prevent coccidiosis or bloat is prohibited. Should a lamb become sick or injured and require an antibiotic or other form of medication, that lamb should be treated individually and identified in some fashion to ensure that it can be properly segregated. Niman Ranch will not purchase treated lambs.

The use of wormers, dips, pour-ons, and routine vaccinations are approved for use, provided they are administered for the wellness of the lambs (preventing parasites), and that the manufacturer's recommended withdrawal time is observed.

Close attention must be given to condition of the animals' hooves. If foot rot occurs, animals must be checked over, isolated and treated promptly.

Provisions must be made for segregation and proper treatment and care of sick/injured animals, and if necessary, humanely euthanized.

Castration/Tail Docking/Museling:
Tail docking must be carried out for cleanliness and to protect the health of lambs from fly infestation. Tail docking and castration must be performed prior to one month of age. The timing of these procedures and the method used is done in consideration of the well being of the lamb, in terms of stress, minimizing blood loss, and when sanitation of the procedure can be controlled to minimize infections.

Museling must never be performed. Museling is the removal of strips of flesh from the anal and vaginal area to deter flies. This practiced in the United States and is most common with production systems in Australia and New Zealand where wool breeds are predominant. Niman Ranch and other domestic sheep producers employ proper management such as good breeding and tail docking to prevent fly infestations.

Weaning:
Weaning shall take place at an age that considers the health and welfare of both the lamb and its mother. This age may vary depending on the breed of the ewe and level of milk production, her age and health, and the health of her lambs. Weaning should never take place before 5 weeks of age. The recommended minimum weaning age is 90 days (12 weeks of age).

Transit:
Loading docks and ramps must be designed to minimize slippage during loading.

Persons who transport live lambs should attend to the animals and take necessary steps to ensure that the animals are not injured or caused to suffer during loading, transport, and unloading.

Predation:
All animals should be appropriately protected from predation and environmental hazards. Non-lethal methods are used including fencing, guard animals, noise devises, field rotations, and mix species grazing (cattle and sheep in the same field). Fences should be tight and properly

monitored and maintained. Under no circumstances should traps or poison be used to control predation. Predator control should coincide with all federal, state, and local governmental regulations and, when necessary, the local Wildlife Service should be consulted to help curb predator loss.

Feeder Lambs

Niman Ranch does not source feeder lambs from other producers. All lambs sold by Niman Ranch are born, raised, and fed by the family farmers we purchase them from.

Finishing Pastures or Pens

Lambs shall be given adequate space to behave naturally and, whenever possible, should be housed with their natural social group (the animals with whom they were raised). Lambs must not be confined closely for any reason other than examinations, vaccinations, tests, veterinary treatment, feeding, washing, dipping, and transit loading. Individual lambs can only be kept in isolation from other sheep if they are being treated for sickness.

Lambs are typically grain fed for 45 to 70 days. Finishing periods may be increased or decreased based on grass conditions, weaning weights, and body condition and weight of lambs before being fed grain.

The grouping of lambs into the finishing pens are based on similar age, similar weight, and similar body conditions so all lambs have the same opportunities in establishing social order and utilizing food sources. This type of grouping helps minimizes unfair social competitions among lambs. This type of grouping encourages all the lambs to leave the finishing pens at approximately the same time so new lambs entering the finishing pens are not commingled with lambs that have been on feed for a length of time.

Feed shall consist of a vegetarian diet of grains, alfalfa, or roughage in some combination, and shall never contain animal by-products of any kind. Salt-mineral mix should be made available at all times.

Water and feed will be provided free choice with a constant flow of fresh water. Troughs should be cleaned regularly.

Pens shall be kept clean to ensure satisfactory hygiene and comfort. Surroundings shall not prevent animals from behaving naturally or be cause for undue stress.

The feedlot should be designed such that it has no negative impact to the environment. Manure should be managed as a beneficial by-product and recycled appropriately as on-farm fertilizer or adequate space should be provided in feed lot such that manure accumulation is not an issue.

Rangeland Management

Ranchers shall treat their rangeland and cropland as a sustainable resource. Proper land management that ensures better resource use and promotes long-term sustainability is basic to future food production and to the economic welfare of rural communities.

Sheep grazing can enhance range and grasslands when managed appropriately. Proper grazing management can stimulate sensitive plant growth and sensitive animal populations. By following proper grazing management that takes into consideration both the well-being of the environment and the well-being of the sheep, each of our ranches are uniquely different and what works for one ranch might not work for another ranch.

Range management techniques such as appropriate fencing, salt placement, feed supplementation during drought, providing additional water sources, improving trails and herding are used to improve the distribution of livestock on the ranges.

Proper land management includes carefully monitoring the quality/fertility of soils, presence of vegetation cover, acidification, plant nutrient status, erosion, organic matter, salinity and salinization (particularly in irrigated systems). Soil water availability must be optimized and used through environmentally safe soil management.

Niman Ranch Cage-Free Egg Protocols

Niman Ranch's mission is to produce the finest tasting proteins in the world by adhering to a strict code of traditional husbandry principles. We have registered the following claims with the USDA:

- All-Natural
- No Antibiotics – Ever
- No Added Hormones – Ever
- All Vegetarian Feeds
- Humanely Raised on Environmentally Sustainable Ranches

I. Source Verification and Franchisee Requirements:

A representative of Niman Ranch will have a personal relationship with every supplier of cage-free eggs to the Niman Ranch cage-free egg program and our protocols must be followed through all aspects of egg production.

All Niman Ranch production facilities must operate in accordance with accepted USDA, FDA and state requirements and regulations.

II. Husbandry: Flocks producing Niman Ranch eggs should be stocked and managed in accordance with acceptable welfare standards.

a. Breeding:

- All approved layers will be descendants of Rhode Island Red Hens or Bovan Brown Breeds.
- Laying hens are selected for their ability to produce consistently sized, shaped and colored eggs.

b. Housing :

- Niman Ranch follows the guidelines required under the Humane Farm Animal Care and American Humane Certified programs. Cage-Free hens must be provided a minimum of 1.5 sq ft of floor space per hen or 1.2 sq ft if perches are provided and 1.0 sq ft for aviaries and where 50% of birds are able to access perches with 6" linear space per hen.
- Ventilation, feeding and watering systems should function effectively and should be regularly inspected and undergo preventive maintenance in accordance with industry practice and manufacturer's recommendations

III. Antibiotic Use: Administration of antibiotic or other therapeutic drug in either feed or water will disqualify any flock from production of eggs to be marketed under the Niman Ranch brand.

IV. Responsible farming practices: Niman Ranch expects certified farmers to uphold environmentally safe and approved manner that adheres to all county, state and federal standards. This includes, but is not limited to manure management practices, stocking densities, and disposal of mortality.

V. Feeds: Diets for Niman Ranch flocks must comply with the following restrictions (Niman Ranch will conduct random tests on feed samples to detect the presence of prohibited ingredients).

a. Feed should be formulated by a qualified nutritionist in accordance with the specifications suggested by the primary breeder of the strain housed.

b. Exclusion of all animal-source ingredients including grease, tallow, fish and aquaculture meals, and by-product meals including but not limited to poultry and feather meal, blood meal, carcass meal, meat and bone meal, bone meal.

c. Exclusion of recycled vegetable products, bakery waste, by-products of human food preparation and rejected batches of food products.

d. Exclusion of antibiotics and any non-approved additive including but not limited to copper sulfate.

e. Exclusion of cottonseed meal and derivatives. Natural components of cottonseed including gossypol result in discoloration of yolks (olive mottling) and albumen (pink discoloration).

f. Canola meal is not permitted in brown layer diets, since it can cause abnormal egg flavor.

g. Biotene®10 must be incorporated in diets at a level of 0.5% for flocks consuming over a range of 18-24 1bsl100 hens/day. This product contains all necessary vitamin and mineral micronutrients obviating additional supplements. Biotene®lO formulations incorporating chlorine chloride and approved enzyme supplements are available only from ADM.

h. Chlorine chloride supplements (70% active ingredient) should not be used in excess of 5 lbs./ton in diets for brown-egg layer flocks.

i. Stabilized canola oil must be provided at an inclusion rate of 2.5% of diets. Crude super-degummed or refined oil can be used. Low-linolenic, partially hydrogenated and acidulated soap stock oils are not acceptable.

j. For brown-egg flocks, diets should contain a maximum of 2.5% canola oil. As an alternative, the diet may include a minimum of 1 % supplementary oil comprising a mixture of 25% edible grade canola oil and 75% edible grade soybean oil. In addition, the alternative diet must include not more than 2.5% whole flaxseed. When feeding flaxseed, supplementary granite grit should be provided to flocks. Addition of 50 lbs of 118" granite grit to one ton of the first delivery of NR feed should be sufficient to facilitate digestion. Ground flaxseed should not be used, as this ingredient is subject to oxidation and may result in abnormal flavor of eggs. Flaxseed inhibits absorption of iodine and inclusion at levels over 5% will reduce iodine levels of eggs to below the Niman Ranch specification.

k. Conventional levels of calcium (not less than 3.5%) and available phosphorus (not less than 0.4% without phytase or equivalent enzyme) should be included to optimize shell strength according to the recommendations of a qualified nutritionist.

l. Ingredients supplying calcium (Limestone or oyster shell) should be included in both coarse and fine-ground form.

m. Ingredients originating in countries other than the U.S. or Canada may not be incorporated in diets fed to hens producing Niman Ranch cage-free eggs without a waiver relating to country of origin, quantity, nutrient specifications and analyses.

n. Representative 1 lb. samples of feed, labeled as to date, type, and plant of origin, must be submitted to Niman Ranch on a monthly basis.

NO DRUG OR ADDITIVE, OTHER THAN A GENERALLY REGARDED AS SAFE (GRAS) PRODUCT, WHICH IS UNAPPROVED BY NIMAN RANCH SHALL BE PRESENT IN FEED MILL UNLESS SECURED IN A LOCKED STOREROOM OR IF NOT APPROVED BY THE FDA, SHALL BE PRESENT IN ANY PLANT OR MILL SUPPLYING FLOCKS PRODUCING NIMAN RANCH PRODUCT.

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IV. Vaccinations:

a. All pullets destined for Niman Ranch production must be vaccinated successively at least three times to protect against *Salmonella* Enteritidis, by administering a USDA- licensed live attenuated/mutant *Salmonella* Typhimurium vaccine. Vaccines must be administered according to manufacturer's recommendations at the hatchery.

b. All cage-free (non-confined) pullets placed should receive a USDA-licensed inactivated oil emulsion Salmonella Enteritidis vaccine two weeks prior to or at the time of transfer to the laying facility.

V. Production: It is absolutely necessary to positively identify Niman Ranch product through the entire sequence of storage, processing and distribution and to ensure segregation from generic eggs. Inventory must be managed in accordance with a first-in, first-out rotation.

a. All plants processing NR eggs must be under USDA-AMS inspection and comply with NR and USDA regulations governing the physical plant and equipment, in addition to compliance with quality, safety and grading standards. Plants not approved or monitored by the USDA are disqualified from packing products under the NR Brand. Effective December 31, 2009, all plants packing any NR product should be in the process of SQF 2000 level 2 certification. Level 3 certification should be in the process by June 30, 2010.

b. Niman Ranch eggs must be collected daily and clean eggs must be farm-packed on clean fiber trays. Racks or pallets used to transport Niman Ranch eggs must be differentiated (color coded, bar-coded or otherwise labeled in a readily distinguishable way) from pallets used to store and move generic eggs. All racks holding Niman Ranch eggs should be identified by flock of origin and date of production using a color-coded or otherwise easily identifiable label to maintain accurate trace-back to farm of origin.

c. Special precautions will be taken to segregate eggs from flocks producing Niman Ranch eggs from generic eggs. This can be accomplished b scheduling the sequence of operation of collecting belts and packing for in-line operations. Barriers in the inline conveyors can also be used to separate generic eggs from Niman Ranch eggs.

d. Eggs shall be removed from houses at least once per 24 hours. This requires operation of egg belts and cross-conveyors on a daily basis. With off-line production, eggs shall be transferred to a cooler daily, operated at a temperature not to exceed 60°F and at a humidity ranging from 60% to 75% RH. Egg storage must be in compliance with the strictest requirements set by state or federal guidelines. Eggs should be transported to a packing plant at intervals not exceeding seven days and preferably less than four days, especially during the summer.

Pineland Farms Natural Meats, Inc.
Program Requirements

Pineland Farms Natural Meats, Inc. (PFNM) has developed the following guidelines to assure cattle meet program requirements and label claims.

Prohibited at any time during the life of the animal:

Growth promoting hormones administered as an implant, in feed or by injection.
Included but not limited to Melengestrol Acetate (MGA), estradiol, progesterone, zeranoid and steroids.
Antibiotics administered either orally or by injection. Included but not limited to Penicillin, Cephalosporin, Aminoglycosides, Sulfonamides, Fluoroquinolones, Florfinicol, Macrolides, Tetracyclines, Ionophores, Enrofloxacin. (Deccox is allowed).
Animal by-products as feed and in feed supplements.

Required of all cattle marketed to PFNM:

Animal sourcing - All cattle marketed to PFNM must be sourced to birth. Animals purchased from any point beyond their farm of birth must be accompanied by signed affidavits attesting the animal has never received prohibited items from each previous owner. Sale or transfer of animals must be accompanied by signed affidavits for each point of ownership.

Animal care - Animals must receive humane treatment as it pertains to housing, nutrition and health.

Records - Complete and accurate records must be kept on all cattle in current inventory. Complete and accurate records are to be maintained and made available for up to three years after the shipment of an animal. Complete and accurate records on all cattle must include source or origin with accompanying signed affidavits, animal ID, birth dates, treatment records and shipment or disposal documentation. WNF reserves the right to periodic review of cattle inventory records.

Animal identification - An identification system and documentation that follows the animals from birth to shipment must be implemented. All cattle marketed will be identified with a unique visual ID ear tag, to be provided by PFNM. All change in ID from purchase to the sale of an animal must be documented.

Animal disqualification - All animals disqualified due to the use of prohibited items, the inability to source the animal to birth, or the lack of signed affidavits must be identified in a manner that differentiates them from PFNM cattle.

Non-PFNM cattle - Operations feeding both conventional and PFNM cattle must provide a physical barrier and/or separation between the two groups of cattle.

Pineland Farms Natural Meats, Inc. , 60 Pineland Dr., Suite 115, New Gloucester, ME 04260
207-688-4808, 207-688-4266 www.pinelandnaturalmeats.com

5 Step Animal Welfare Rating™ Standards for Beef Cattle Step 1 Recommendations

All standards applicable to "All Steps" or to any range of Steps that include Step 1 are required and must be met for the ranch/farm to enter the Global Animal Partnership 5 Step Program. Higher Steps are elective after the basic requirements of Step 1 have been met.

If a standard has not been met for all animals on the farm at the time of initial inspection, a Step rating will not be assigned until evidence is provided confirming that the standard has been met. For castration, pain relief, or weaning standards that are not met at the time of initial inspection, a Step rating will not be assigned until evidence is provided confirming that either the standard has been met or all relevant procedures and protocols are in place to meet the standard going forward.

If in a particular situation or circumstance, a standard as written might compromise the welfare of the animals in the producer's care, the producer should contact the Global Animal Partnership-approved certifier with which they are working to request a variance.

Producers must be in compliance with all local, regional, and national regulations and laws that relate to the Global Animal Partnership 5 Step Animal Welfare Rating standards.

No standards in this document may supersede local, regional, or national regulations or laws.

Note: There is no Step 3 for cattle.

Step 1: No crowding
Step 2: Enriched environment
Step 4: Pasture centered
Step 5: Animal centered: No physical alterations
Step 5+: Animal Centered: Entire life on same farm

Table of Contents

Section 1: Ranch/Farm Plan and Documentation

1.1 Ranch/Farm Plan

1.1.1 (All Steps)

Each ranch/farm must have a written plan that identifies practices implemented to ensure compliance with all applicable sections of the Global Animal Partnership 5 Step Animal Welfare Rating standards.

A written ranch/farm plan must exist.

It must be current and updated as needed to reflect any changes.

It must address all relevant areas covered by these standards.

The ranch/farm plan must reflect actual practices on the ranch/farm.

The completed Application/Workbook will suffice for this requirement.

Producer Guidance: Your farm plan should be a description of the goals and methods of your ranching/farming operation. By filling in the workbook and describing your actual practices, you may satisfy the requirements for this standard. The intent of this workbook is to assist you in putting down your practices in writing and can act as a "how-to" manual if someone has to step into your operation in an emergency. An important benefit of developing a farm plan is that often helps to focus the goals that you are trying to achieve. Importantly, writing down what is second nature to you will allow you, and others, to appreciate the good work that you do and the magnitude of what you know, do, and accomplish throughout the day, the month, and the year.

1.2 Animal Health Plan

1.2.1 (All Steps)

Each ranch/farm must plan for the health of the animals. Planning must include biosecurity measures.

1.3 Records and Documentation

1.3.1 (All Steps)

Each ranch/farm must maintain and provide the inspector full access to records sufficient to document compliance with all applicable Global Animal Partnership 5 Step Animal Welfare Rating standards. Informal records such as those written on calendars or notepads are acceptable but must be presented in an organized manner at inspection.

1.4 Emergency Procedures

1.4.1 (All Steps)

There must be procedures to follow in case of emergency. Anyone engaged in animal management must be aware of the emergency procedures and trained to take action should an emergency occur.

Producer Guidance: Emergency procedures might include contingency plans for natural disasters likely to occur in the area. Fire, emergency disease outbreak, emergency water shut off, and power failure should also be addressed. Instructions should be detailed enough to ensure the safety and well-being of animals and workers during an emergency.

1.5 Training

1.5.1 (All Steps)

Initial and ongoing training must be provided in a manner that is clearly understood by all individuals who carry out any animal management tasks covered by this program.

Producer Guidance:

Training should expand awareness and recognition that animals feel pain and have the capacity to suffer.

Training should provide an overview of the entire operation as well as specific training related to the tasks that will be required. Ongoing training should aim at keeping up to date with current animal husbandry techniques and the requirements of the Global Animal Partnership standards. Training can be experience-based or written.

Training might cover, but is not limited to, the following topics:

a. Artificial insemination
b. Assessment of cows/heifers to identify risks at calving
c. Assistance at calving
d. Any physical alterations, including the administration of pain relief
e. Animal handling
f. Movement and transport of animals
g. Animal identification, including branding and tagging
h. Assessment of body condition
i. Recognition of lameness
j. Appropriate use of restraint tools
k. Feeding protocols
. Assessment of range/pasture condition

1.6 Biosecurity Procedures

1.6.1 (All Steps)

Each ranch/farm must implement and maintain a biosecurity program. The program must include measures taken to avoid the introduction of disease from outside sources, such as incoming stock, visitors, and trucks or equipment.

Section 2: Breeding and Source of Animals

2.1 Breeding Programs

2.1.1 (All Steps)

Natural breeding and artificial insemination (AI) are the only breeding methods permitted.

2.1.2 (All Steps)

The intentional use of genetically modified or cloned animals or their progeny is prohibited.

2.1.3 (All Steps)

Breeding programs, whether on-ranch/farm or through introduced breeding stock, must be designed to promote the welfare of the animals in the production system rather than to select solely for production or economic outcomes. Breeding choices based solely on production outcomes that predispose the animals for reduced welfare in a system are prohibited.

Welfare-enhancing traits that must be sought in breeding programs are:

Breeds chosen to ensure heifers and cows can calve without assistance.

Selective breeding program aimed toward polled animals if disbudding is practiced.

2.2 Source of Animals

3

2.2.1 (All Steps)
The types of animals must be well matched with the system in which they are raised.
Producer Guidance: The goal of the farm/ranch should be to find animals that work best in the circumstances of the farm/ranch and to avoid welfare problems caused by breed selection.

2.2.2 (All Steps)
Sourcing market animals from sale or auction barns is prohibited. When animals are purchased through video auctions, animals must have remained on the originating ranch/farm property until the sale is complete.

Section 3: Animal Health

3.1 Medication Use

3.1.1 (All Steps)
The therapeutic use of antibiotics, ionophores, or sulfa drugs is prohibited for market animals. If a market animal must be treated with prohibited medications, that animal must be identified and removed from the Global Animal Partnership 5 Step Animal Welfare program.

3.1.2 (All Steps)
Sub-therapeutic (preventive) levels of antibiotics, ionophores, growth hormones, beta agonists, or sulfas are prohibited for all market and breeding animals.

3.1.3 (All Steps)
Records must be kept of all treatments, whether alterative remedies or medications, and the results of treatment.

3.1.4 (All Steps)
No medicines may be used in an extra-label manner unless prescribed by the farm's attending veterinarian. Any such medicine must have the prescribing veterinarian's label affixed over the manufacturer's label that outlines the prescribed method of usage, duration of administration, and withholding time.

3.1.5 (All Steps)
All medications must be discarded after the expiration date.

3.2 Treatment of Ill or Injured Animals

3.2.1 (All Steps)
In the event an animal becomes ill or suffers accidental injury on the farm, it must receive immediate individual treatment designed to minimize pain and suffering, including veterinary attention if relief cannot be promptly provided by the farmer.

3.2.2 (All Steps)
If alternative treatments such as herbal or homeopathic treatments are used and are not successful, veterinary advice must be sought and any medication prescribed must be administered.

3.2.3 (All Steps)
If an animal is suffering from a non-recoverable illness, injury, or condition, it must be promptly euthanized on-farm using an approved method.

3.3 Body Condition

3.3.1 (All Steps)
All cattle must have an overall body condition score (BCS) of 4 or higher.

3.3.2 (All Steps)

Any animals on the ranch/farm scoring below BCS 4 must be given immediate care and treated if necessary. Any animal in an emaciated condition (less than BCS 2) that does not respond to treatment must be euthanized using an approved method.

3.4 Lameness

3.4.1 (All Steps)

Lameness levels must not exceed 2% of the herd at any one time.

3.4.2 (All Steps)

Lame animals must be attended to and action taken immediately upon exhibition of foot or leg injury, or walking irregularity. If improvements are not seen, treatment must be escalated. If the animal is bearing no weight on one of its limbs or is severely lame and not responding to a treatment regimen, it must be euthanized. Actions taken to address lameness and results must be recorded.

Producer Guidance: Depending on the severity and cause of lameness, animals may need to be monitored, isolated for a period, or medically treated.

3.5 Separation of Newly Introduced, Ill, or Injured Animals from the Herd

3.5.1 (All Steps)

Animals must not be separated from the herd unless briefly during introduction to the ranch/farm, for veterinary procedures, or if the animal is injured or sick. Records must be kept of the separation from the herd of individual animals.

3.5.2 (All Steps)

The primary enclosure for sick or injured animals must meet all space and bedding requirements in Section 8.

Section 4: Animal Handling

4.1 Restraint

4.1.1 (All Steps)

Electro-immobilization is prohibited.

4.1.2 (All Steps)

Squeeze chutes or cattle crushes must be operated in a manner that does not cause injury or distress to the animals. The chute must not be so tight that it affects the animal's breathing. For hydraulic chutes, the relief valve must be set so the sides automatically stop squeezing before it is too tight for the animal to be able to breathe normally.

4.1.3 (All Steps)

Lariats may be used when necessary only by handlers who are experts in the use of this tool and only in a manner that minimize pain and distress to the animals.

Producer Guidance: Anyone being trained on the use of lariats should be taught using practice dummies or other non-living targets. Roping expertise should be established through testing and verified in the ranch training record. New employees with previous roping experience should also be tested to verify their expertise and the results of the testing recorded.

4.2 Cattle Handling

4.2.1 (All Steps)

Cattle must not be mistreated in any way.

4.2.2 (All Steps)

Cattle must be handled in a calm manner that takes into consideration the animals' natural response to stimuli.

4.2.3 (All Steps)

When handling cattle, the area must be quiet and free of high-pitched noises.

4.2.4 (All Steps)

Cattle must move of their own volition. They may not be dragged by any part of their body.

4.2.5 (All Steps)

Stock dogs and horses used to move cattle must be well-trained and must be controlled at all times. All dogs used with cattle must be under the direct control of a dog handler.

4.3 Electric Prods

4.3.1 (All Steps)

The use of electric prods during handling is prohibited unless there is imminent risk of injury to the animal or handler. The prod must not be carried routinely by the handler. If it is necessary to prod an animal, shocking the animal on any part of its body other than the muscle of its hindquarters is prohibited.

Section 5: Animal Management

5.1 Calving

5.1.1 (All Steps)

The rancher/farmer must be able to check on unproven cows and heifers at calving time and provide timely assistance if necessary.

5.1.2 (All Steps)

The number of assisted calvings and caesarians, taken together, must not exceed 5% of all calvings per year. Accurate records must be kept and made available at inspection.

5.1.3 (All Steps)

Areas used for calving, whether inside or out, must not put the newborn calf at risk of illness or infection.

Producer Guidance: Pastures used for calving should ideally have been rested from use by cattle before calving cows are introduced, or stocked at such a low rate that challenge from parasites or infection does not occur. If cows calve inside, the pens or barns should have been cleaned and rebidded prior to introducing calving cows.

5.2 Weaning

5.2.1 Weaning Age: Step Differentiation

Minimum weaning age is 6 months.

5.3 Animal Identification

5.3.1 (All Steps)

The producer must demonstrate traceability of all GAP-rated animals, including all locations where each animal has been kept since birth.

5.3.2 (All Steps)

All animals must be individually identified.

5.3.3 (All Steps)

No more than two ear tags per animal are permitted, whether breeding stock or market animals. If two ear tags are required by law, a third ear tag may be used providing it does not interfere with the animal's ability to express normal behavior.

5.3.5 (All Steps)

Wattling is prohibited.

5.4 Branding

Producer Guidance: Hot iron branding is extremely painful for the animals. Freeze branding is less painful and equally effective, especially for dark coated animals. There is substantial information on the websites of various universities with good agricultural programs regarding freeze branding materials and procedures. For further information regarding this procedure, please contact one of these organizations.

5.4.2 (All Steps)

Face branding is prohibited.

5.5 Castration and Spaying

NOTE: Ideally, castration should occur prior to 7 days of age using an emasculator ring.

5.5.1 Castration Age:

If calves are castrated, the procedure must occur prior to 6 months of age.

Producer Guidance: These standards apply to castration by ranch/farm personnel. Castration by a veterinarian may be carried out outside of these ages if using long- and short-term pain relief.

5.5.2 Castration Method: Step Differentiation

If calves are castrated, one of the following methods must be used:

Compression using rings

High tension bands after 3 months of age (Note: High tension bands are prohibited prior to 3 months of age.)

Surgery

Burdizzo

5.5.3 (All Steps)

Spaying is prohibited.

5.6 Disbudding and Horn Removal

5.6.1 Disbudding: Step Differentiation

If calves are to be disbudded, the procedure must occur prior to 6 weeks of age. Short-term pain relief must be used when disbudding calves with a hot iron.

5.6.2

If disbudding is practiced, the ranch/farm must demonstrate a breeding program designed to select for polled cattle.

5.6.3 (All Steps)

Routine tipping of horns is prohibited. Tipping an individual animal's horns is permitted only when necessary to prevent horns from growing into the animal's head or in response to behavior that puts other animals or handlers at risk. Tipping an individual animal's horns to stop it from being aggressive to other animals or handlers must only be carried out after contributing factors, such as group size, feeder space, and lying space, have been addressed.

Producer Guidance: The difference between tipping and de-horning is that tipping removes only non-living horn material. If the operation extends to the point of cutting into living tissue in the central core of the horn, this is dehorning and is prohibited.

5.6.4 (All Steps)

The removal of horns (de-horning) is prohibited.

5.7 Bullied Animals

5.7.1 (All Steps)

Any bullied animal must be immediately removed from the group to a safe location, treated for any injuries and stabilized.

Producer Guidance: One example of a bullied animal is known as "buller syndrome." A "buller" is a steer that is ridden excessively by other males. Bullied animals should be removed from the group in which they were victimized, treated, and stabilized. They can be then be re-introduced to their original group. They should be watched closely for signs of repetition of the behavior and removed permanently if this does occur.

Section 6: Feed and Water

6.1 Water Availability

6.1.1

All animals must have free and continuous access to drinking water. In systems where animals move between indoors and outdoors, water must be continuously accessible in both areas.

6.2 Feeding Requirements

6.2.1

All animals must be provided with a full ration that supplies optimal nutrition at each specific stage of life.

Producer Guidance: "Optimal nutrition" means that the combination of feed, including rations, supplements, and fiber, are sufficient to maintain the animal in good body condition (see Section 3) and to ensure the animal does not remain hungry after feeding.

6.2.2

Palatable fibrous food, such as grass, hay, haylage, or silage, must be continuously available. Straw and corn stover are unacceptable as the only fibrous foods.

6.2.3

Animals must be fed in a manner that enables all animals to eat their full ration.

6.2.4

When feed type and/or sources are being changed, cattle must have the dietary changes introduced gradually as not to disturb digestive function.

6.3 Feed Safety and Hygiene

6.3.1

Feed must not become moldy, mildewed, or otherwise compromised in quality.

6.3.2

Feed must not be contaminated by rodents.

6.3.3

Feeders must be clean and free of foreign objects.

6.4 Additives or Ingredients in Feed or Water

6.4.1

Mammalian or avian by-products or wastes, with the exception of milk or milk-derived products, are prohibited.

Section 7: Range/Pasture and Outdoor Requirements

7.1 Range/Pasture

7.1.1 Range/Pasture Access: Step Differentiation

All cattle must spend at least 2/3 of their lives on range or pasture when seasonal conditions permit. Removing an animal from range or pasture for more than 1/3 of its life is prohibited.

7.1.2 Circumstances for Removal from Range/Pasture: Step Differentiation

Cattle may be removed from range or pasture for finishing or when seasonal conditions compromise the welfare of the animals or during extreme weather conditions when the outdoor environment poses a risk to welfare.

7.1.3 Vegetative Cover Requirements on Pasture or Range: Step Differentiation

There must be at least 50% vegetative cover in each occupied area.

7.2 Outdoor Conditions

7.2.1

All animals must be protected from heat or cold stress and from extreme weather.

Producer Guidance: The producer must be able to demonstrate protocols for protecting animals from heat and cold stress and extreme weather.

7.2.2

All outdoor areas and structures accessible to the animals must be maintained in a way so that they do not pose risk of injury.

7.2.3

Animals must be protected from contact with any potentially toxic substances.

Producer Guidance: All potentially toxic materials, such as paints or anti-corrosives, pest control substances, or lubricants, must be properly stored and used in a manner that prevents animals from coming into contact with them.

7.2.4

If electricity is required for the delivery of water or feed, a back-up power supply (with power failure alarm) must be operational and periodically tested.

7.3 Outdoor Access from Seasonal Housing

7.3.1

Housed cattle must have continuous, unobstructed access to the outdoors.

7.3.2

Outdoor areas accessed from housing must allow animals to rest and protect the animals' hoof and leg health. Bare concrete and/or mud surfaces are unacceptable as the only surfaces. There must be sufficient area where animals can rest and retreat from concrete and mud surfaces.

7.4 Outdoor Confinement Conditions

7.4.1

Cattle may not be confined to an outdoor area that is less than 250 ft^2/24m^2 per animal.

7.4.2

Whenever cattle are confined outdoors, they must have a clean, dry place to lie.

Section 8: Housing Conditions

NOTE: Because animals may be housed seasonally at Step 4, Step 4 is included in both the outdoor and housing sections. If Step 5 or 5+ animals are brought into housing for more than 24 hours during a weather emergency, the following standards must be met.

8.1 Space Requirements for Housing

8.1.1

When housed, animals must have enough space to be able to lie down and get up simultaneously without bumping or pushing another animal; move about freely; exercise, sleep, rest, and ruminate undisturbed; groom; play; and perform normal social behavior.

8.2 Bedding Requirements

8.2.1

Bedding must be provided in all housing.

8.2.2
Bedding must be dry, clean, fresh, and of sufficient quantity to cover the inside lying area completely and to provide comfort and protection for all animals.
8.2.3
Bedding must be straw or other non-toxic substance.

8.3 Air Quality

8.3.1
Air quality must be regularly assessed at the level of the animals through sensory evaluation or other appropriate methods.

8.4 Safety, Sanitation and Maintenance in Housing

8.4.1
Flooring must minimize the possibility of animals slipping. Floors must be solid and constructed of, or covered with, non-slip material.
8.4.2
All equipment, fittings, fences, gates, openings, and protrusions must be maintained in good working order and in such a manner that they do not inflict injuries or pose risks to the animals or caretakers.
8.4.3
Animals must be protected from contact with any potentially toxic substances used for maintenance, sanitation, cleaning, or pest control. All potentially toxic materials, such as sanitizers, pest control substances, and lubricants, must be properly stored and used in a manner that prevents animals from coming into contact with them.
8.4.4
It must be possible to quickly remove animals from housing in an emergency.
8.4.5
If electricity is required for ventilation, water, feeding, or lighting, a back-up power supply (with power failure alarm) must be operational and periodically tested.

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Section 9: Insect, Rodent, and Predator Control

9.1 Insect and Parasite Control

9.1.1
The use of organophosphates or any product containing organophosphates in any manner in which an animal might ingest or absorb them is prohibited

9.2 Rodent Control

9.2.1
The producer must minimize risk to cattle posed by rodents.
9.2.2
Exclusion of rodents from housing and feed storage areas or other non-lethal methods must be the first level of protection. Buildings must be constructed and/or maintained in such a manner as to prevent the intrusion of rodents.
9.2.3
Poisons for the control or elimination of rodents are permitted only after exclusion has failed.
Producer Guidance: Methods used to control rodents should be swift and efficient, and not cause unnecessary suffering. Currently, poison used to control or eliminate rodents is unavoidable in certain farming models, and it is acknowledged that poison does cause suffering. The ultimate goal is to prohibit its use entirely. One of the unwanted side effects of using poisoned bait is that it can attract rodents to the area and exacerbate the problem. It is essential

to design any baiting procedures to attract only rodents already posing a danger and to avoid attracting more rodents to the area.

9.3 Predator Control

9.3.1
The producer must minimize risk to cattle posed by predators.

9.3.2
Exclusion of predators from housing and outdoor areas or other non-lethal methods must be the first level of defense.

9.3.3
Methods of control and/or elimination of predators must be swift and efficient, and must not cause suffering.

9.3.4
Poisons for the control or elimination of predators that are posing a risk to cattle are prohibited.

9.3.5
Lethal means of predator control must target the offending animal(s) only.

9.4 Methods of Control

9.4.1
All varieties of leg-hold traps, including egg traps, neck snares, conibear traps, glue boards, and drowning traps, are prohibited.

Producer Guidance: Box traps that capture animals alive without restricting them from movement are permitted.

9.4.2 Live Trap Monitoring: Step Differentiation
Live traps without monitors must be checked at least daily. If live trap monitors are used, they must be acted upon within 24 hours of an alert

Section 10: Movement and Transport of Animals

NOTE: Transport pertains to transporting animals onto or off the farm. Movement pertains to moving animals within the farm. Step 5+ allows movement of animals ONLY within the farm.

10.1 Movement of Animals Within the Farm

10.1.1
Movement within the farm must not exceed two hours. If movement of animals exceeds two hours, all transport standards apply.

10.1.2
Calves must not be moved on a vehicle within the farm except to access range or pasture where they will remain with their mothers.

10.1.3
The trailer or other conveyance must be clean and in good condition.

Producer Guidance: Specific areas to evaluate, whether the trailer is an on-farm conveyance or a hired trailer moving animals off the farm, are:

Is the floor of the trailer in good condition or worn? Is the flooring surface sufficiently textured to prevent slipping and falling?

Is the aluminum torn or broken so as to present the risk of injury to the animals?

Is the exhaust system in good repair so fumes do not enter the pens

10.1.4
All ramps and floors must be constructed in such a way to minimize animals slipping. Floors must be solid and constructed of non-slip material.

Producer Guidance: Loading ramps must be appropriately designed and should have foot battens or be covered with litter to prevent animals slipping or falling.

10.1.5

Animals must be able to stand naturally.

10.1.6

Animals must be able to step into and out of the vehicle easily and safely.

10.2 Disposition of Animals

10.3 Condition of Animals at Transport

10.3.1

Transporting unhealthy, non-ambulatory, or injured animals off the ranch/farm for any reason other than to access veterinary treatment is prohibited.

Producer Guidance: It is permitted to transport an unhealthy or injured animal to access veterinary treatment.

10.3.2

Pregnant cows must not be transported off the ranch/farm within 12 weeks of expected calving.

10.3.3

Calves must not be transported onto or off of the ranch/farm prior to weaning. Orphaned calves may be transported only when their welfare will be improved.

10.4 Transport Duration

NOTE: At no time may transport exceed in-country regulatory requirements.

10.4.1 Transport Duration: Step Differentiation

Transport must not exceed 25 hours.

Producer Guidance: No animal may be subjected to a journey longer than the duration listed above unless that journey is specifically intended to improve or safeguard the welfare of the animals.

10.4. Extending transport duration past the maximum time-span by removing the animals from the truck to rest before continuing the journey is prohibited.

10.5 Transport of Animals

NOTE: If the farm conducts or contracts transport, subsection 10.5 applies to the farm. If a producer group, cooperative, or other organization conducts or contracts transport, subsection 10.5 applies to the producer group, cooperative, or other organization. The ranch/farm must adhere to producer group policies and practices.

10.5.1

The trailer or other conveyance must be clean and in good condition.

Producer Guidance: Specific areas to evaluate, whether the trailer is an on-ranch/farm conveyance or a hired trailer moving animals off the ranch/farm, are:

If the floor of the trailer is diamond plate, is it in good condition or worn? If it is another material, is its surface sufficient to prevent slipping and falling?

Is the aluminum torn or broken so as to present the risk of injury to the animals?

Is the exhaust system in good repair so fumes do not enter the pens?

10.5.2

All ramps and floors, whether internal or external, must be constructed in such a way to minimize animals slipping. Floors must be solid and constructed of non-slip material.

Producer Guidance: Loading ramps must be appropriately designed and should have foot battens or be covered with litter to prevent animals slipping or falling.

10.5.3

Animals must be able to stand naturally.

10.5.4
The driver must be able to inspect all animals on the truck.
Producer Guidance: The truck design should provide visual access to all animals. If the interior lighting is not sufficient for this purpose or is not working, the driver should carry a flashlight or other light source to be able to inspect the animals.
10.5.5
The truck must be designed to allow the driver to attend to an animal in distress.
Producer Guidance: Access to individual compartments may be through the main loading door, but provision of a separate inspection door giving access to each floor or tier is recommended.
10.5.6
Animals must be able to step into and out of the vehicle easily and safely.
10.5.7
Animals must have access to water until loading begins.

10.5.8
Animals must be protected from heat and cold stress during transport.
10.5.9
During transport, space allowance must meet the requirements in the table below. Cattle must be given 10% more floor space than the standard allowance when the temperature in the truck exceeds 25°C/77°F.
10.5.10
The use of electric prods during loading and unloading is prohibited unless there is imminent risk of injury to the animal or handler.
Producer Guidance: If electric prods are used, they may only be used if it is absolutely necessary for the welfare of the animal or the safety of the handler. The prod may not be carried routinely by the handler. If it is necessary to prod an animal, shocking the animal on any part of its body other than the muscle of its hindquarters violates this standard. No shock may last more than 2 seconds and no more than two shocks may be delivered to any one animal.

10.6 Transport Personnel Responsibilities, Training, and Procedures

NOTE: If the farm conducts or contracts transport, Sub-section 10.6 applies to the farm. If a producer group, cooperative, or other organization conducts or contracts transport, Subsection 10.6 applies to the producer group, cooperative, or other organization. The ranch/farm must adhere to producer group policies and practices.
10.6.1
Personnel involved with transport must be licensed to drive the type of truck used for transport, thoroughly trained, and competent to carry out the tasks required of them.
10.6.2
The driver is responsible for the animals during all aspects of loading, delivery, and unloading that are under his/her control.
10.6.3
Transport records for each group of animals, including loading start and end times, departure and arrival times, and reasons for any stops or delays en route, must be kept and made available for review.
10.6.4
If the truck is scheduled to pick up animals at more than one ranch/farm, a separate bill of lading/delivery note must be kept for each ranch/farm.

Category	Weight (in kg / lb)	Area in m^2/animal	Area in ft^2/animal
Small calves	55 / 121	0.30 to 0.40	3.23 to 4.30
Medium-sized calves	110 / 242	0.40 to 0.70	4.30 to 7.53
Heavy calves	200 / 440	0.70 to 0.95	7.53 to 10.22
Medium-sized cattle	325 / 715	0.95 to 1.30	10.22 to 14.00
Heavy cattle	550 / 1210	1.30 to 1.60	14.00 to 17.22
Very heavy cattle	>700 / 1540	>1.60	>17.22

10.6.5

If a truck has animals from different properties and/or sources, the groups of animals must be segregated.

10.6.6

If a truck is transporting animals of different species, they must be segregated during transport.

Producer Guidance: Animals of different species must not be transported in the same compartment. They can be transported on the same vehicle.

10.6.7

Horned and non-horned animals must not be transported in the same compartment.

10.6.8

There must be a clear, written procedure for the driver to follow that includes actions and contact numbers to ensure the highest welfare of the animals in case of an accident or emergency en route.

Producer Guidance: These should include actions that can be taken by the driver and a clear point at which he/she should call for assistance. The driver must have an emergency number that will reach the staff field agent, rancher, or farmer who can initiate logistical actions that could include getting a replacement truck to the scene, getting a crew to the scene to reload the animals, and designating a person responsible for euthanizing or separating injured animals.

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Global Animal Partnership 5-Step™
Animal Welfare Rating Standards for Beef Cattle

- All standards applicable to "All Steps" or to any range of Steps that include Step 1 are required and must be met for the ranch/farm to enter the Global Animal Partnership 5-Step Program. Higher Steps are elective after the basic requirements of Step 1 have been met.

- If a standard has not been met for all animals on the farm at the time of initial inspection, a Step rating will not be assigned until evidence is provided confirming that the standard has been met. For castration, pain relief, or weaning standards that are not met at the time of initial inspection, a Step rating will not be assigned until evidence is provided confirming that either the standard has been met or all relevant procedures and protocols are in place to meet the standard going forward.

- If in a particular situation or circumstance, a standard as written might compromise the welfare of the animals in the producer's care, the producer should contact the Global Animal Partnership-approved certifier with which they are working to request a variance.

- Producers must be in compliance with all local, regional, and national regulations and laws that relate to the Global Animal Partnership 5-Step Animal Welfare Rating standards.

- No standards in this document may supersede local, regional, or national regulations or laws.

- Note: There is no Step 3 for cattle.

Step 1: No crowding
Step 2: Enriched environment
Step 4: Pasture centered
Step 5: Animal centered: No physical alterations
Step 5+: Animal Centered: Entire life on same farm

Table of Contents

Section 1: Ranch/Farm Plan and Documentation

1.1 Ranch/Farm Plan

1.1.1 (All Steps)

Each ranch/farm must have a written plan that identifies practices implemented to ensure compliance with all applicable sections of the Global Animal Partnership 5-Step Animal Welfare Rating standards.

- A written ranch/farm plan must exist.
- It must be current and updated as needed to reflect any changes.
- It must address all relevant areas covered by these standards.
- The ranch/farm plan must reflect actual practices on the ranch/farm.

The completed Application/Workbook will suffice for this requirement.

> **Producer Guidance:** Your farm plan should be a description of the goals and methods of your ranching/farming operation. By filling in the workbook and describing your actual practices, you may satisfy the requirements for this standard. The intent of this workbook is to assist you in putting down your practices in writing and can act as a "how-to" manual if someone has to step into your operation in an emergency. An important benefit of developing a farm plan is that often helps to focus the goals that you are trying to achieve. Importantly, writing down what is second nature to you will allow you, and others, to appreciate the good work that you do and the magnitude of what you know, do, and accomplish throughout the day, the month, and the year.

1.1.2 (Steps 5 – 5+)

In addition to the above, each ranch/farm plan must include:

a. Evidence of an integrated all-farm approach with proactive measures in place that demonstrate an agricultural animal production system with primary emphasis on animal welfare.
b. The primary producer must be able to demonstrate inherent strengths in animal husbandry based on a good understanding of interactions within an animal production system.

To qualify for Step 5 or 5+ status, all species of commercial animals raised on the ranch/farm must be raised to at least Step 1 standards. Within two years of approval at Step 5 levels, all commercial animals on the property must meet at least Step 4 requirements.

> **Producer Guidance:** The two-year allowance to bring all commercial animals to Step 4 levels will be granted to the producer one time only. If the ranch/farm loses Step 5 status and re-applies, Step 4 status of all commercial animals will be required to re-establish the previous Step level.

1.1.3 (Steps 5 – 5+)

All domestic animals on the ranch/farm must be managed to the following requirements:

- Given an appropriate amount and type of feed to meet their nutritional requirements
- Kept in surroundings that do not cause them injury
- Provided with a comfortable resting area that protects them from extremes of temperature
- Kept in good health and given veterinary attention as required
- Dogs must not be tethered

> **Producer Guidance:** "Domestic animals" refers to dogs, cats, horses, goats, cows, or any other animals maintained on the ranch/farm for non-commercial purposes, including both working

animals and pets. Leashes may be used with dogs when they are being moved about the ranch/farm or when temporarily removed from their runs for cleaning, but they may not be tied and left for long periods of time.

1.2 Animal Health Plan

1.2.1 (All Steps)
Each ranch/farm must plan for the health of the animals. Planning must include biosecurity measures.

1.3 Records and Documentation

1.3.1 (All Steps)
Each ranch/farm must maintain and provide the inspector full access to records sufficient to document compliance with all applicable Global Animal Partnership 5-Step Animal Welfare Rating standards. Informal records such as those written on calendars or notepads are acceptable but must be presented in an organized manner at inspection.

1.4 Emergency Procedures

1.4.1 (All Steps)
There must be procedures to follow in case of emergency. Anyone engaged in animal management must be aware of the emergency procedures and trained to take action should an emergency occur.

Producer Guidance: Emergency procedures might include contingency plans for natural disasters likely to occur in the area. Fire, emergency disease outbreak, emergency water shut off, and power failure should also be addressed. Instructions should be detailed enough to ensure the safety and well-being of animals and workers during an emergency.

1.5 Training

1.5.1 (All Steps)
Initial and ongoing training must be provided in a manner that is clearly understood by all individuals who carry out any animal management tasks covered by this program.

Producer Guidance:

- Training should expand awareness and recognition that animals feel pain and have the capacity to suffer.
- Training should provide an overview of the entire operation as well as specific training related to the tasks that will be required. Ongoing training should aim at keeping up to date with current animal husbandry techniques and the requirements of the Global Animal Partnership standards. Training can be experience-based or written.
- Training might cover, but is not limited to, the following topics:
  a. Artificial insemination
  b. Assessment of cows/heifers to identify risks at calving
  c. Assistance at calving
  d. Any physical alterations, including the administration of pain relief
  e. Animal handling
  f. Movement and transport of animals
  g. Animal identification, including branding and tagging

h. Assessment of body condition
i. Recognition of lameness
j. Appropriate use of restraint tools
k. Feeding protocols
l. Assessment of range/pasture condition

1.6 Biosecurity Procedures

1.6.1 (All Steps)
Each ranch/farm must implement and maintain a biosecurity program. The program must include measures taken to avoid the introduction of disease from outside sources, such as incoming stock, visitors, and trucks or equipment.

Section 2: Breeding and Source of Animals

2.1 Breeding Programs

2.1.1 (All Steps)
Natural breeding and artificial insemination (AI) are the only breeding methods permitted.

2.1.2 (All Steps)
The intentional use of genetically modified or cloned animals or their progeny is prohibited.

2.1.3 (All Steps)
Breeding programs, whether on-ranch/farm or through introduced breeding stock, must be designed to promote the welfare of the animals in the production system rather than to select solely for production or economic outcomes. Breeding choices based solely on production outcomes that predispose the animals for reduced welfare in a system are prohibited.

Welfare-enhancing traits that must be sought in breeding programs are:
- Breeds chosen to ensure heifers and cows can calve without assistance.
- Selective breeding program aimed toward polled animals if disbudding is practiced.

2.2 Source of Animals

2.2.1 (All Steps)
The types of animals must be well matched with the system in which they are raised.

> **Producer Guidance:** The goal of the farm/ranch should be to find animals that work best in the circumstances of the farm/ranch and to avoid welfare problems caused by breed selection.

2.2.2 (All Steps)
Sourcing market animals from sale or auction barns is prohibited. When animals are purchased through video auctions, animals must have remained on the originating ranch/farm property until the sale is complete.

Section 3: Animal Health

3.1 Medication Use

3.1.1 (All Steps)
The therapeutic use of antibiotics, ionophores, or sulfa drugs is prohibited for market animals. If a market animal must be treated with prohibited medications, that animal must be identified and removed from the Global Animal Partnership 5-Step Animal Welfare program.

3.1.2 (All Steps)
Sub-therapeutic (preventive) levels of antibiotics, ionophores, growth hormones, beta agonists, or sulfas are prohibited for all market and breeding animals.

3.1.3 (All Steps)
Records must be kept of all treatments, whether alterative remedies or medications, and the results of treatment.

3.1.4 (All Steps)
No medicines may be used in an extra-label manner unless prescribed by the farm's attending veterinarian. Any such medicine must have the prescribing veterinarian's label affixed over the manufacturer's label that outlines the prescribed method of usage, duration of administration, and withholding time.

3.1.5 (All Steps)
All medications must be discarded after the expiration date.

3.2 Treatment of Ill or Injured Animals

3.2.1 (All Steps)
In the event an animal becomes ill or suffers accidental injury on the farm, it must receive immediate individual treatment designed to minimize pain and suffering, including veterinary attention if relief cannot be promptly provided by the farmer.

3.2.2 (All Steps)
If alternative treatments such as herbal or homeopathic treatments are used and are not successful, veterinary advice must be sought and any medication prescribed must be administered.

3.2.3 (All Steps)
If an animal is suffering from a non-recoverable illness, injury, or condition, it must be promptly euthanized on-farm using an approved method.

3.3 Body Condition

3.3.1 (All Steps)
All cattle must have an overall body condition score (BCS) of 4 or higher.

3.3.2 (All Steps)
Any animals on the ranch/farm scoring below BCS 4 must be given immediate care and treated if necessary. Any animal in an emaciated condition (less than BCS 2) that does not respond to treatment must be euthanized using an approved method.

3.4 Lameness

3.4.1 (All Steps)
Lameness levels must not exceed 2% of the herd at any one time.

3.4.2 (All Steps)
Lame animals must be attended to and action taken immediately upon exhibition of foot or leg injury, or walking irregularity. If improvements are not seen, treatment must be escalated. If the animal is bearing no weight on one of its limbs or is severely lame and not responding to a treatment regimen, it must be euthanized. Actions taken to address lameness and results must be recorded.

> **Producer Guidance:** Depending on the severity and cause of lameness, animals may need to be monitored, isolated for a period, or medically treated.

3.5 Separation of Newly Introduced, Ill, or Injured Animals from the Herd

3.5.1 (All Steps)
Animals must not be separated from the herd unless briefly during introduction to the ranch/farm, for veterinary procedures, or if the animal is injured or sick. Records must be kept of the separation from the herd of individual animals.

3.5.2 (All Steps)
The primary enclosure for sick or injured animals must meet all space and bedding requirements in Section 8.

Section 4: Animal Handling

4.1 Restraint

4.1.1 (All Steps)
Electro-immobilization is prohibited.

4.1.2 (All Steps)
Squeeze chutes or cattle crushes must be operated in a manner that does not cause injury or distress to the animals. The chute must not be so tight that it affects the animal's breathing. For hydraulic chutes, the relief valve must be set so the sides automatically stop squeezing before it is too tight for the animal to be able to breathe normally.

4.1.3 (All Steps)
Lariats may be used when necessary only by handlers who are experts in the use of this tool and only in a manner that minimize pain and distress to the animals.

> **Producer Guidance:** Anyone being trained on the use of lariats should be taught using practice dummies or other non-living targets. Roping expertise should be established through testing and verified in the ranch training record. New employees with previous roping experience should also be tested to verify their expertise and the results of the testing recorded.

4.2 Cattle Handling

4.2.1 (All Steps)
Cattle must not be mistreated in any way.

4.2.2 (All Steps)
Cattle must be handled in a calm manner that takes into consideration the animals' natural response to stimuli.

4.2.3 (All Steps)
When handling cattle, the area must be quiet and free of high-pitched noises.

4.2.4 (All Steps)
Cattle must move of their own volition. They may not be dragged by any part of their body.

4.2.5 (All Steps)
Stock dogs and horses used to move cattle must be well-trained and must be controlled at all times. All dogs used with cattle must be under the direct control of a dog handler.

4.3 Electric Prods

4.3.1 (All Steps)
The use of electric prods during handling is prohibited unless there is imminent risk of injury to the animal or handler. The prod must not be carried routinely by the handler. If it is necessary to prod an animal, shocking the animal on any part of its body other than the muscle of its hindquarters is prohibited.

Section 5: Animal Management

5.1 Calving

5.1.1 (All Steps)
The rancher/farmer must be able to check on unproven cows and heifers at calving time and provide timely assistance if necessary.

5.1.2 (All Steps)
The number of assisted calvings and caesarians, taken together, must not exceed 5% of all calvings per year. Accurate records must be kept and made available at inspection.

5.1.3 (All Steps)
Areas used for calving, whether inside or out, must not put the newborn calf at risk of illness or infection.

> **Producer Guidance:** Pastures used for calving should ideally have been rested from use by cattle before calving cows are introduced, or stocked at such a low rate that challenge from parasites or infection does not occur. If cows calve inside, the pens or barns should have been cleaned and re-bedded prior to introducing calving cows.

5.2 Weaning

5.2.1 Weaning Age: Step Differentiation

5.2.1 (Steps 1 – 4)
Minimum weaning age is 6 months.

5.2.1 (Step 5)
Minimum weaning age is 8 months.

5.2.1 (Step 5+)
Natural weaning is required.

If the welfare of a cow or calf may be compromised by leaving calves on the cow to the weaning age, an individual calf may be weaned earlier than the Step requirements listed above. In no instance may calves be weaned prior to 6 months unless the cow or calf's health is in jeopardy. Records of early weaning must be made available at audit.

For Step 5+ ranches/farms, intact bull calves can be removed from their mothers at puberty.

5.2.2 (Step 5)
Fenceline or two-stage weaning is required. If two-stage weaning is practiced, stage 1—in which the calf is prevented from suckling from its mother—must last at least 7 days. If there are other methods of low-stress weaning in use, the rancher/farmer must be prepared to explain the rationale and provide evidence of their effectiveness at inspection.

> **Producer Guidance:** Although this standard is required only for Step 5 status, it is recommended for all Steps.

5.3 Animal Identification

5.3.1 (All Steps)
The producer must demonstrate traceability of all GAP-rated animals, including all locations where each animal has been kept since birth.

5.3.2 (All Steps)
All animals must be individually identified.

5.3.3 (All Steps)
No more than two ear tags per animal are permitted, whether breeding stock or market animals. If two ear tags are required by law, a third ear tag may be used providing it does not interfere with the animal's ability to express normal behavior.

5.3.4 (Steps 5 – 5+)
Ear notching of breeding and market animals is prohibited.

5.3.5 (All Steps)
Wattling is prohibited.

5.4 Branding

5.4.1 (Steps 5 – 5+)
Branding is prohibited.

> **Producer Guidance:** Hot iron branding is extremely painful for the animals. Freeze branding is less painful and equally effective, especially for dark coated animals. There is substantial information on the websites of various universities with good agricultural programs regarding freeze branding materials and procedures. For further information regarding this procedure, please contact one of these organizations.

5.4.2 (All Steps)
Face branding is prohibited.

5.5 Castration and Spaying
NOTE: Ideally, castration should occur prior to 7 days of age using an emasculator ring.

5.5.1 Castration Age: Step Differentiation

5.5.1 (Step 1)
If calves are castrated, the procedure must occur prior to 6 months of age.

5.5.1 (Steps 2 – 4)
If calves are castrated, the procedure must occur prior to 3 months of age.

5.5.1 (Steps 5 – 5+)
Castration is prohibited.

Producer Guidance: These standards apply to castration by ranch/farm personnel. Castration by a veterinarian may be carried out outside of these ages if using long- and short-term pain relief.

5.5.2 Castration Method: Step Differentiation

5.5.2 (Step 1)
If calves are castrated, one of the following methods must be used:

- Compression using rings
- High tension bands after 3 months of age (Note: High tension bands are prohibited prior to 3 months of age.)
- Surgery
- Burdizzo

5.5.2 (Steps 2-4)
If calves are castrated, one of the following methods must be used:

- Compression using rings
- Surgery
- Burdizzo

5.5.3 (All Steps)
Spaying is prohibited.

5.6 Disbudding and Horn Removal

5.6.1 Disbudding: Step Differentiation

5.6.1 (Steps 1 – 4)
If calves are to be disbudded, the procedure must occur prior to 6 weeks of age. Short-term pain relief must be used when disbudding calves with a hot iron.

5.6.1 (Steps 5 – 5+)
Disbudding is prohibited.

5.6.2 (Steps 1 – 4)
If disbudding is practiced, the ranch/farm must demonstrate a breeding program designed to select for polled cattle.

5.6.3 (All Steps)
Routine tipping of horns is prohibited. Tipping an individual animal's horns is permitted only when necessary to prevent horns from growing into the animal's head or in response to behavior that puts other animals or handlers at risk. Tipping an individual animal's horns to stop it from being aggressive to other animals or handlers must only be carried out after contributing factors, such as group size, feeder space, and lying space, have been addressed.

Producer Guidance: The difference between tipping and de-horning is that tipping removes only non-living horn material. If the operation extends to the point of cutting into living tissue in the central core of the horn, this is dehorning and is prohibited.

5.6.4 (All Steps)
The removal of horns (de-horning) is prohibited.

5.7 Bullied Animals

5.7.1 (All Steps)
Any bullied animal must be immediately removed from the group to a safe location, treated for any injuries and stabilized.

Producer Guidance: One example of a bullied animal is known as "buller syndrome." A "buller" is a steer that is ridden excessively by other males. Bullied animals should be removed from the group in which they were victimized, treated, and stabilized. They can be then be re-introduced to their original group. They should be watched closely for signs of repetition of the behavior and removed permanently if this does occur.

Section 6: Feed and Water

6.1 Water Availability

6.1.1 (All Steps)
All animals must have free and continuous access to drinking water. In systems where animals move between indoors and outdoors, water must be continuously accessible in both areas.

6.2 Feeding Requirements

6.2.1 (All Steps)
All animals must be provided with a full ration that supplies optimal nutrition at each specific stage of life.

> **Producer Guidance:** "Optimal nutrition" means that the combination of feed, including rations, supplements, and fiber, are sufficient to maintain the animal in good body condition (see Section 3) and to ensure the animal does not remain hungry after feeding.

6.2.2 (All Steps)
Palatable fibrous food, such as grass, hay, haylage, or silage, must be continuously available. Straw and corn stover are unacceptable as the only fibrous foods.

6.2.3 (All Steps)
Animals must be fed in a manner that enables all animals to eat their full ration.

6.2.4 (All Steps)
When feed type and/or sources are being changed, cattle must have the dietary changes introduced gradually as not to disturb digestive function.

6.3 Feed Safety and Hygiene

6.3.1 (All Steps)
Feed must not become moldy, mildewed, or otherwise compromised in quality.

6.3.2 (All Steps)
Feed must not be contaminated by rodents.

6.3.3 (All Steps)
Feeders must be clean and free of foreign objects.

6.4 Additives or Ingredients in Feed or Water

6.4.1 (All Steps)
Mammalian or avian by-products or wastes, with the exception of milk or milk-derived products, are prohibited.

Section 7: Range/Pasture and Outdoor Requirements

7.1 Range/Pasture

7.1.1 Range/Pasture Access: Step Differentiation

7.1.1 (Steps 1 – 2)
All cattle must spend at least 2/3 of their lives on range or pasture when seasonal conditions permit. Removing an animal from range or pasture for more than 1/3 of its life is prohibited.

7.1.1 (Step 4)
Cattle must spend at least 3/4 of their lives on range or pasture when seasonal conditions permit. Removing an animal from range or pasture for more than 4 months in any one year or for more than 1/4 of the animal's life is prohibited.

7.1.1 (Steps 5 – 5+)
Cattle must live continuously on range or pasture.

7.1.2 Circumstances for Removal from Range/Pasture: Step Differentiation

7.1.2 (Steps 1 – 2)
Cattle may be removed from range or pasture for finishing or when seasonal conditions compromise the welfare of the animals or during extreme weather conditions when the outdoor environment poses a risk to welfare.

7.1.2 (Step 4)
Cattle may be removed from range or pasture only when seasonal conditions compromise the welfare of the animals or during extreme weather conditions when the outdoor environment is poses a risk to welfare.

7.1.2 (Step 5 – 5+)
It is prohibited to remove cattle from range or pasture except during extreme weather conditions that pose a risk to welfare.

Seasonal or weather-related removal from range or pasture must be temporary and as short in duration as possible. The rancher/farmer must be able to justify removing cattle from pasture either seasonally or in extreme weather conditions.

7.1.3 Vegetative Cover Requirements on Pasture or Range: Step Differentiation

7.1.3 (Steps 1 – 4)
There must be at least 50% vegetative cover in each occupied area.

7.1.3 (Steps 5 – 5+)
There must be at least 75% vegetative cover in each occupied area.

No more than 50% (Steps 1 – 4) or 25% (Steps 5 – 5+) of the occupied outdoor area can be exposed, bare earth.

7.2 Outdoor Conditions

7.2.1 (All Steps)
All animals must be protected from heat or cold stress and from extreme weather.

> **Producer Guidance:** The producer must be able to demonstrate protocols for protecting animals from heat and cold stress and extreme weather.

7.2.2 (Step 2, Steps 5 – 5+)
Shade must be provided that accommodates all animals in all outdoor areas.

> **Producer Guidance:** If shade cloth is used, it should be of a design that filters out at least 50% of solar radiation.

7.2.3 (Step 2)
All animals in outdoor areas must have continuous access to a structure for shelter.

> **Producer Guidance:** The structure can be housing, a roofed loafing shed, lean-to, or other such structure.

7.2.4 (Step 2)
Animals must be provided with objects on which to scratch or groom.

7.2.5 (All Steps)
All outdoor areas and structures accessible to the animals must be maintained in a way so that they do not pose risk of injury.

7.2.6 (All Steps)
Animals must be protected from contact with any potentially toxic substances.

> **Producer Guidance:** All potentially toxic materials, such as paints or anti-corrosives, pest control substances, or lubricants, must be properly stored and used in a manner that prevents animals from coming into contact with them.

7.2.7 (All Steps)
If electricity is required for the delivery of water or feed, a back-up power supply (with power failure alarm) must be operational and periodically tested.

7.3 Outdoor Access from Seasonal Housing

7.3.1 (Steps 1 – 4)
Housed cattle must have continuous, unobstructed access to the outdoors.

7.3.2 (Steps 1 – 4)
Outdoor areas accessed from housing must allow animals to rest and protect the animals' hoof and leg health. Bare concrete and/or mud surfaces are unacceptable as the only surfaces. There must be sufficient area where animals can rest and retreat from concrete and mud surfaces.

7.4 Outdoor Confinement Conditions

7.4.1 (Steps 1 – 4)
Cattle may not be confined to an outdoor area that is less than 250 ft²/24m² per animal.

7.4.2 (Steps 1 – 4)
Whenever cattle are confined outdoors, they must have a clean, dry place to lie.

Section 8: Housing Conditions

NOTE: Because animals may be housed seasonally at Step 4, Step 4 is included in both the outdoor and housing sections. If Step 5 or 5+ animals are brought into housing for more than 24 hours during a weather emergency, the following standards must be met.

8.1 Space Requirements for Housing

8.1.1 (Steps 1 – 4)
When housed, animals must have enough space to be able to lie down and get up simultaneously without bumping or pushing another animal; move about freely; exercise, sleep, rest, and ruminate undisturbed; groom; play; and perform normal social behavior.

8.2 Bedding Requirements

8.2.1 (Steps 1 – 4)
Bedding must be provided in all housing.

8.2.2 (Steps 1 – 4)
Bedding must be dry, clean, fresh, and of sufficient quantity to cover the inside lying area completely and to provide comfort and protection for all animals.

8.2.3 (Steps 1 – 4)
Bedding must be straw or other non-toxic substance.

8.3 Air Quality

8.3.1 (Steps 1 – 4)
Air quality must be regularly assessed at the level of the animals through sensory evaluation or other appropriate methods.

8.4 Safety, Sanitation and Maintenance in Housing

8.4.1 (Steps 1 – 4)
Flooring must minimize the possibility of animals slipping. Floors must be solid and constructed of, or covered with, non-slip material.

8.4.2 (Steps 1 – 4)
All equipment, fittings, fences, gates, openings, and protrusions must be maintained in good working order and in such a manner that they do not inflict injuries or pose risks to the animals or caretakers.

8.4.3 (Steps 1 – 4)
Animals must be protected from contact with any potentially toxic substances used for maintenance, sanitation, cleaning, or pest control. All potentially toxic materials, such as sanitizers, pest control substances, and lubricants, must be properly stored and used in a manner that prevents animals from coming into contact with them.

8.4.4 (Steps 1 – 4)
It must be possible to quickly remove animals from housing in an emergency.

8.4.5 (Steps 1 – 4)
If electricity is required for ventilation, water, feeding, or lighting, a back-up power supply (with power failure alarm) must be operational and periodically tested.

Section 9: Insect, Rodent, and Predator Control

9.1 Insect and Parasite Control

9.1.1 (All Steps)
The use of organophosphates or any product containing organophosphates in any manner in which an animal might ingest or absorb them is prohibited

9.2 Rodent Control

9.2.1 (All Steps)
The producer must minimize risk to cattle posed by rodents.

9.2.2 (All Steps)
Exclusion of rodents from housing and feed storage areas or other non-lethal methods must be the first level of protection. Buildings must be constructed and/or maintained in such a manner as to prevent the intrusion of rodents.

9.2.3 (All Steps)
Poisons for the control or elimination of rodents are permitted only after exclusion has failed.

> **Producer Guidance:** Methods used to control rodents should be swift and efficient, and not cause unnecessary suffering. Currently, poison used to control or eliminate rodents is unavoidable in certain farming models, and it is acknowledged that poison does cause suffering. The ultimate goal is to prohibit its use entirely. One of the unwanted side effects of using poisoned bait is that it can attract rodents to the area and exacerbate the problem. It is essential to design any baiting procedures to attract only rodents already posing a danger and to avoid attracting more rodents to the area.

9.3 Predator Control

9.3.1 (All Steps)
The producer must minimize risk to cattle posed by predators.

9.3.2 (All Steps)
Exclusion of predators from housing and outdoor areas or other non-lethal methods must be the first level of defense.

9.3.3 (All Steps)
Methods of control and/or elimination of predators must be swift and efficient, and must not cause suffering.

9.3.4 (All Steps)
Poisons for the control or elimination of predators that are posing a risk to cattle are prohibited.

9.3.5 (All Steps)
Lethal means of predator control must target the offending animal(s) only.

9.4 Methods of Control

9.4.1 (All Steps)
All varieties of leg-hold traps, including egg traps, neck snares, conibear traps, glue boards, and drowning traps, are prohibited.

> **Producer Guidance:** Box traps that capture animals alive without restricting them from movement are permitted.

9.4.2 Live Trap Monitoring: Step Differentiation

9.4.2 (Steps 1 – 4)
Live traps without monitors must be checked at least daily. If live trap monitors are used, they must be acted upon within 24 hours of an alert

9.4.2 (Steps 5 – 5+)
Live traps without monitors must be checked at least twice daily. If live trap monitors are used they must be acted upon within 6 hours of an alert.

Section 10: Movement and Transport of Animals

NOTE: Transport pertains to transporting animals onto or off the farm. Movement pertains to moving animals within the farm. Step 5+ allows movement of animals ONLY within the farm.

10.1 Movement of Animals Within the Farm

10.1.1 (All Steps)
Movement within the farm must not exceed two hours. If movement of animals exceeds two hours, all transport standards apply.

10.1.2 (All Steps)
Calves must not be moved on a vehicle within the farm except to access range or pasture where they will remain with their mothers.

10.1.3 (All Steps)
The trailer or other conveyance must be clean and in good condition.

> **Producer Guidance:** Specific areas to evaluate, whether the trailer is an on-farm conveyance or a hired trailer moving animals off the farm, are:
> - Is the floor of the trailer in good condition or worn? Is the flooring surface sufficiently textured to prevent slipping and falling?
> - Is the aluminum torn or broken so as to present the risk of injury to the animals?
> - Is the exhaust system in good repair so fumes do not enter the pens

10.1.4 (All Steps)
All ramps and floors must be constructed in such a way to minimize animals slipping. Floors must be solid and constructed of non-slip material.

> **Producer Guidance:** Loading ramps must be appropriately designed and should have foot battens or be covered with litter to prevent animals slipping or falling.

10.1.5 (All Steps)
Animals must be able to stand naturally.

10.1.6 (All Steps)
Animals must be able to step into and out of the vehicle easily and safely.

10.2 Disposition of Animals

10.2.1 (Steps 5 – 5+)
Sale through auction or sale barns is prohibited.

NOTE: The long-term intention of these standards is to extend this requirement to all steps. This standard will be reviewed on an annual basis.

10.2.2 (Step 5+)
Slaughter must occur either on ranch/farm or at a location the animals can easily and safely reach by walking.

Slaughter conducted on or adjacent to the ranch/farm must be conducted under USDA or state inspection. A separate third party audit of both animal welfare and food safety must be successfully completed prior to the ranch receiving a Step 5+ rating.

10.3 Condition of Animals at Transport

10.3.1 (Steps 1 – 5)
Transporting unhealthy, non-ambulatory, or injured animals off the ranch/farm for any reason other than to access veterinary treatment is prohibited.

> **Producer Guidance:** It is permitted to transport an unhealthy or injured animal to access veterinary treatment.

10.3.2 (Steps 1 – 5)
Pregnant cows must not be transported off the ranch/farm within 12 weeks of expected calving.

10.3.3 (Steps 1 – 5)
Calves must not be transported onto or off of the ranch/farm prior to weaning. Orphaned calves may be transported only when their welfare will be improved.

10.4 Transport Duration

NOTE: At no time may transport exceed in-country regulatory requirements.

10.4.1 Transport Duration: Step Differentiation

10.4.1 (Step 1)
Transport must not exceed 25 hours.

10.4.1 (Steps 2 – 4)
Transport must not exceed 16 hours.

10.4.1 (Step 5)
Transport must not exceed 8 hours total.

10.4.1 (Step 5+)
Transport to or from the ranch/farm is prohibited.

> **Producer Guidance:** No animal may be subjected to a journey longer than the duration listed above unless that journey is specifically intended to improve or safeguard the welfare of the animals.

10.4.2 (Steps 1 – 5)
Extending transport duration past the maximum time-span by removing the animals from the truck to rest before continuing the journey is prohibited.

10.5 Transport of Animals

NOTE: If the farm conducts or contracts transport, subsection 10.5 applies to the farm. If a producer group, cooperative, or other organization conducts or contracts transport, subsection 10.5 applies to the producer group, cooperative, or other organization. The ranch/farm must adhere to producer group policies and practices.

10.5.1 (Steps 1 – 5)
The trailer or other conveyance must be clean and in good condition.

Producer Guidance: Specific areas to evaluate, whether the trailer is an on-ranch/farm conveyance or a hired trailer moving animals off the ranch/farm, are:

- If the floor of the trailer is diamond plate, is it in good condition or worn? If it is another material, is its surface sufficient to prevent slipping and falling?
- Is the aluminum torn or broken so as to present the risk of injury to the animals?
- Is the exhaust system in good repair so fumes do not enter the pens?

10.5.2 (Steps 1 – 5)
All ramps and floors, whether internal or external, must be constructed in such a way to minimize animals slipping. Floors must be solid and constructed of non-slip material.

Producer Guidance: Loading ramps must be appropriately designed and should have foot battens or be covered with litter to prevent animals slipping or falling.

10.5.3 (Steps 1 – 5)
Animals must be able to stand naturally.

10.5.4 (Steps 1 – 5)
The driver must be able to inspect all animals on the truck.

Producer Guidance: The truck design should provide visual access to all animals. If the interior lighting is not sufficient for this purpose or is not working, the driver should carry a flashlight or other light source to be able to inspect the animals.

10.5.5 (Steps 1 – 5)
The truck must be designed to allow the driver to attend to an animal in distress.

Producer Guidance: Access to individual compartments may be through the main loading door, but provision of a separate inspection door giving access to each floor or tier is recommended.

10.5.6 (Steps 1 – 5)
Animals must be able to step into and out of the vehicle easily and safely.

10.5.7 (Steps 1 – 5)
Animals must have access to water until loading begins.

10.5.8 (Steps 1 – 5)
Animals must be protected from heat and cold stress during transport.

10.5.9 (Steps 1 – 5)
During transport, space allowance must meet the requirements in the table below. Cattle must be given 10% more floor space than the standard allowance when the temperature in the truck exceeds 25°C/77°F.

Category	Weight (in kg / lb)	Area in m^2/animal	Area in ft^2/animal
Small calves	55 / 121	0.30 to 0.40	3.23 to 4.30
Medium-sized calves	110 / 242	0.40 to 0.70	4.30 to 7.53
Heavy calves	200 / 440	0.70 to 0.95	7.53 to 10.22
Medium-sized cattle	325 / 715	0.95 to 1.30	10.22 to 14.00
Heavy cattle	550 / 1210	1.30 to 1.60	14.00 to 17.22
Very heavy cattle	>700 / 1540	>1.60	>17.22

10.5.10 (All Steps)
The use of electric prods during loading and unloading is prohibited unless there is imminent risk of injury to the animal or handler.

> **Producer Guidance:** If electric prods are used, they may only be used if it is absolutely necessary for the welfare of the animal or the safety of the handler. The prod may not be carried routinely by the handler. If it is necessary to prod an animal, shocking the animal on any part of its body other than the muscle of its hindquarters violates this standard. No shock may last more than 2 seconds and no more than two shocks may be delivered to any one animal.

10.6 Transport Personnel Responsibilities, Training, and Procedures

NOTE: If the farm conducts or contracts transport, Sub-section 10.6 applies to the farm. If a producer group, cooperative, or other organization conducts or contracts transport, Subsection 10.6 applies to the producer group, cooperative, or other organization. The ranch/farm must adhere to producer group policies and practices.

10.6.1 (Steps 1 – 5)
Personnel involved with transport must be licensed to drive the type of truck used for transport, thoroughly trained, and competent to carry out the tasks required of them.

10.6.2 (Steps 1 – 5)
The driver is responsible for the animals during all aspects of loading, delivery, and unloading that are under his/her control.

10.6.3 (Steps 1 – 5)
Transport records for each group of animals, including loading start and end times, departure and arrival times, and reasons for any stops or delays en route, must be kept and made available for review.

10.6.4 (Steps 1 – 5)
If the truck is scheduled to pick up animals at more than one ranch/farm, a separate bill of lading/delivery note must be kept for each ranch/farm.

10.6.5 (Steps 1 – 5)
If a truck has animals from different properties and/or sources, the groups of animals must be segregated.

10.6.6 (Steps 1 – 5)
If a truck is transporting animals of different species, they must be segregated during transport.

> **Producer Guidance:** Animals of different species must not be transported in the same compartment. They can be transported on the same vehicle.

10.6.7 (Steps 1 – 5)
Horned and non-horned animals must not be transported in the same compartment.

10.6.8 (Steps 1 – 5)
There must be a clear, written procedure for the driver to follow that includes actions and contact numbers to ensure the highest welfare of the animals in case of an accident or emergency en route.

> **Producer Guidance:** These should include actions that can be taken by the driver and a clear point at which he/she should call for assistance. The driver must have an emergency number that will reach the staff field agent, rancher, or farmer who can initiate logistical actions that could include getting a replacement truck to the scene, getting a crew to the scene to reload the animals, and designating a person responsible for euthanizing or separating injured animals.

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date and weaning date, as well as information about vaccinations and any necessary veterinary interventions.

Eligible cattle must be source verified from birth with no more than two individuals in the chain of ownership. To fulfill this requirement, all current and previous owners are required to sign an affidavit stating that cattle were raised according to NEFF protocols and deliver it with the animals when they arrive at the slaughter plant for processing.
See **affidavit form**

Note: Order buyers or brokers who act as a purchasing agent for the finishing producer are not considered to be an owner so long as the animals are in their possession for less than 30 days. In these cases, however, both the order buyer/broker and the original owner must provide the required cattle records and affidavits.

4. Pasture Raised
   Our overriding objective is for calves to have the ability to be weaned from their mothers in a natural environment and grow on pastures of grasses and legumes that are indigenous to the areas in which they live. Wherever appropriate, they will be allowed to express their natural behavior. Therefore, they will be raised on free-range pasture until delivered to a NEFF approved finishing feed lot, except when conditions require paddock feeding. Finishing lots are encouraged to use locally raised grains whenever possible. Ideally, cattle will be 16 to 20 months old when going onto grain finishing.

5. Diet
   Once animals are weaned, their diet may contain any combination of grass, legumes and forbs/or stored feeds such as hay, haylage, corn silage, grains and grain by-products (distillers grains, wheat middlings, corn glutten feed, corn bran, etc.). Products prohibited in this diet include but are not limited to animal by-products, fish by-products, bakery by-products, candy, etc.

   Forages must make up at least 50% of the ration fed to animals in the Natural Beef Program. For questions regarding the use of specific feedstuffs or supplements, contact NEFF.

6. Veterinary Treatments
   Proper herd health management including vaccinations and routine deworming are permitted and encouraged. Producers are required to maintain a viable record keeping system listing all treatments and medications that will be available for inspection upon request by NEFF staff.

   The following treatments are not allowed for Natural Beef Program:
   - No hormones are allowed in feed or as animal implants.
   - No feed grade antibiotics are allowed. Antibiotics for therapeutic purposes are permissible. If a sick animal is treated with antibiotics the animal's identification, diagnosis, date, antibiotic and amount administered must be recorded and available for review by NEFF. Antibiotic withdrawal periods must be a minimum of 60 days, which is twice the recommended time of most antibiotic manufacturers.
   - No feed grade fly control agents are permitted.
   - No ionophores or beta-agonists are permitted.

7. Handling of Animals
   Animals must be handled humanely in loading, trucking, and restraint for harvest. Efforts must be made to keep the animals as calm as possible throughout the harvest and transport process.

8. Visual Finish Requirements
   NEFF personnel will visually inspect cattle and determine schedule of harvest when they appear adequately finished.

9. Animals Eligible for the Natural Beef Program
   - Steers and Heifers: maximum of 26 months of age with a carcass weight between 550-975 lb

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Fat cover must appear visually to be adequately dispersed across the animal as determined by NEFF personnel

- Carcasses will be scored by NEFF trained plant personnel on marbling, fat cover, ribeye area and conformation. Producers will receive a report of carcass information.
- Cattle will be targeted to finish as Choice equivalent with marbling scores to the minimum requirement of Choice as determined by NEFF trained personnel.

10. Pricing

The current price paid to producers for cattle that meet or exceed the minimum NEFF natural beef program specifications follows national market price. It is calculated using the USDA-Agricultural Marketing Service weighted average price/lb. for dressed, delivered-basis, beef-breed steers grading in the 65-80% choice range, plus an additional premium of $0.25/lb. **For up to date information on the previous week's weighted average price, visit the AMS 5 Area Weekly Weighted Average Direct Slaughter Cattle report at http://www.ams.usda.gov/mnreports/lm_ct150.txt**

Cattle will be discounted and/or removed from the program if they appear to be mistreated by demonstrating excessive bruises or abnormal carcass conditions. Any animal that is tagged as subject or condemned by USDA inspector will be not allowed into NEFF program and will be financial responsibility of the producer.

All prices and pricing policies are subject to change at the discretion of Northeast Family Farms. NEFF staff will schedule all cattle deliveries to one of several regional slaughter facilities and coordinate payment to individual producers. Payment on cattle will be mailed via U.S. Postal Service within 5 business days of date after cattle harvest.

11. Transportation

Making arrangements for the transportation of animals to a regional slaughter facility designated by NEFF is the responsibility of producers.
For producers greater than 100 miles from a designated slaughter facility: Custom hauling- Upon submission of a dated invoice from a custom hauler, NEFF will reimburse to the seller ½ the cost of transporting cattle to a plant, not to exceed $50.00 per head. Seller hauling- Individuals hauling their own animals to the plant will be reimbursed at a rate of $.20 per head per loaded mile, not to exceed $50.00 per head.
No reimbursement will be made by NEFF for livestock hauled less than 100 miles.

12. Final Product Verification

Carcass quality and maturity will be determined at the packing plant after a 48-hour chill to verify conformance with protocol standards (see section #7). Non-conformance discounts will be applied to all carcasses not meeting specified protocol. Discounts will be as follows:

- Light and heavy carcasses: (< 550 lb. or > 975 lb.) -$15.00/cwt.
- Small and Large Ribeyes (< 10 in2 or > 16 in2) -$15.00/cwt.
- Hardbones and Stags: -$20.00/cwt.
- Dark Cutters: -$20.00/cwt.
- Quality Grades (based on visually estimated marbling score):
  - Select: -$6.00/cwt.
  - Standards: -$15.00/cwt.

Note: NEFF retains the right to refuse any cattle that do not meet it's specifications as determined by pre-harvest evaluation. Specifications are subject to change upon a minimum 90 day notice.

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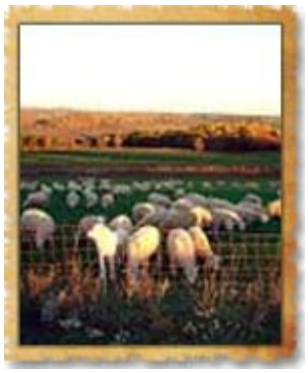
NEFF PORK
LIVE ANIMAL PRODUCTION STANDARDS

- Breeds such as Berkshire, Duroc, Chester White, Old Spot
- Raised on pastures and deeply bedded pens
- Fed a 100% vegetarian diet of grains and grasses
- Raised without added hormones
- Raised without antibiotics

NEFF SMALL LAMB
LIVE ANIMAL PRODUCTION STANDARDS

- Breeds such as White Dorper
- Raised on pasture
- Fed a 100% vegetarian diet of grasses and legumes
- Raised without added hormones
- Raised without antibiotics



NEFF LARGE LAMB
LIVE ANIMAL PRODUCTION STANDARDS

- Breeds such as Suffolk, Hampshire
- Raised on pasture
- Fed a 100% vegetarian diet of only grasses, legumes and grains
- Raised without added hormones
- Raised without antibiotics