Think Globally ~ Eat Locally

SAN FRANCISCO FOODSHED ASSESSMENT

EDWARD THOMPSON, JR.
California Director & Senior Associate
American Farmland Trust

ALETHEA MARIE HARPER
Ag Parks & Food Systems Project Manager
Sustainable Agriculture Education (SAGE)

SIBELLA KRAUS
President, Sustainable Agriculture Education (SAGE)
Director, Agriculture in Metropolitan Regions Program
University of California, Berkeley

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Executive Summary

"Eating Local" has become a phenomenon.

Local food is distinguished, not only by where it originates, but also by who produced it and how. Could the City of San Francisco feed itself with local food from farms and ranches within 100 miles of the Golden Gate? Agriculture within this "foodshed," as it was defined for purpose of this study, produces 20 million tons of food annually, compared with annual food consumption of 935,000 tons in San Francisco and 5.9 million tons in the Bay Area as a whole. In all, more than 80 different commodities are represented, only a few of which are not produced in enough abundance to satisfy the demands of the City and Bay Area: eggs, citrus fruit, wheat, corn, pork and potatoes. Many other commodities are available only seasonally, even though northern California has a long growing season.

It is impossible, however, to determine precisely how much locally-grown food is consumed in the City, or indeed how much of what is consumed is in fact produced by local farms and ranches. The commercial food system in this region, as throughout the United States, does not track the origin of what it sells, primarily because most consumers do not yet demand to know the provenance of what they eat.

Food that is identifiable as local, including that which is organically or "sustainably" produced, is a very small fraction of both total regional agricultural production (0.5 percent) and of total U.S. retail sales (2.8 percent). This sector of the food system is growing rapidly. In the San Francisco foodshed study area, production of food for sale directly to consumers increased 9 percent a year from 1997 and 2002. National organic sales grew 18 percent annually between 1998 and 2006.

Most of what is produced in the San Francisco foodshed study area comes from the Central Valley and the Salinas Valley. Only 18 percent of the farmland in the 10 million acre foodshed study area is irrigated cropland, but it is responsible for three-quarters of total agricultural production by dollar value. This land is increasingly threatened by urban development. Twelve percent of foodshed study area is already developed and new development is consuming farmland at the rate of an acre for every 9.7 residents. If this continues, 800,000 more acres of farmland will be lost by 2050.

Between producers and consumers is an elaborate food distribution system. It has been geared to deliver inexpensive, standardized food products, but is evolving in the direction of delivering the "story behind the food" in response to growing consumer demand. But it has a long way to go. A special challenge is assuring that low-income consumers in the City have access to healthy, local food.

There are other significant challenges that must be addressed to increase both the production of food for local consumption and local consumption of locally-grown food. The traceability of the origin of the food is fundamental. Educating consumers about eating foods that are in-season is another. Capital, know-how and infrastructure will be necessary to enable producers to transition to growing for local, in addition to global markets.

Despite the challenges, there are significant opportunities to increase "eating locally" in San Francisco and the Bay Area. The local food movement in the region has as much momentum and anywhere in the country. Many public and private institutions are now seeking to source food locally. As the fossil fuel era wanes, fresh, local food may gain an advantage in the marketplace over food that is processed and shipped long distances. And, finally, there is the land. No place in the United States, and perhaps the world, is as blessed as San Francisco by the amazing cornucopia produced on farmland within only 100 miles of the Golden Gate.

Introduction

Think Globally, Eat Locally

Eating locally-grown food has become quite a phenomenon. It tastes better and it's better for you, family farmers and the planet.

The local food movement is growing rapidly. The number of farmers markets in the United States is up 150% since 1994 from 1,755 to 4,385.[1] Sales of food directly from farmers to consumers more than doubled between 1992 and 2002, when they reached $812 million.[2] Web sites and newspaper articles about eating locally abound. The New Oxford American Dictionary chose "locavore" – one who eats locally – as its word of the year in 2007. Local food is even being promoted as a solution to global warming – it shrinks the distance food travels from farm to fork, thus reducing greenhouse gas emissions.[3]

According to Gail Feenstra, a nutritionist and food systems analyst at U.C. Davis's Sustainable Agriculture Research & Education Program (SAREP), the local food movement is a "collaborative effort to build more locally based, self-reliant food economies – [an effort] in which sustainable food production, processing, distribution and consumption [are] integrated to enhance the economic, environmental and social health of a particular place."[4]

That place could be San Francisco.

American Farmland Trust was challenged by the San Francisco Foundation to investigate how and to what extent people in the City could improve their well-being and reduce their global "footprint" by eating locally, say, from sources of food within 100 miles of the Golden Gate. This publication[5] documents our search for answers – those we found as well as those we didn't – and recommends a broad course of action aimed at enabling San Francisco and neighboring communities to take better advantage of local sources of food and, thereby, also help the agricultural economy of its "foodshed."

What is "local" food?

Defining "local" food isn't as easy at it may sound. That is certainly the case if the objective is to identify what gives it an advantage over "conventional" food in terms of how its production, processing, shipping and consumption affect health and the environment. As Feenstra's definition of the local food movement implies, the place from which food originates is only part of what makes it "local." The closer food is produced to where it is consumed, the greater the likelihood that it will be fresh, in-season and better tasting, and that getting it to market will use less energy and produce less pollution. These are clearly among the benefits that "locavores" seek.

But the way food is grown is also considered by some to be part of what distinguishes "local" from conventional food. Much of the food now sold at farmers markets, for example, is identified, not only by local origin, but also as organically or "sustainably" grown.[6] These methods

1 Agricultural Marketing Service, USDA, Wholesale and Farmers Markets, http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateS&navID=WholesaleandFarmersMarkets&leftNav=WholesaleandFarmersMarkets&page=WFMFarmersMarketGrowth&description=Farmers%20Market%20Growth&acct=frmrdirmkt

2 U.S. Census of Agriculture (2002), Market value of agricultural products sold, State by county table for California

3 See, H. Hill, National Center for Appropriate Technology, *Food Miles: Background and Marketing* (2008), www.farmland.org/documents/37012/foodmiles.pdf . Others have noted that food processing consumes far more energy than its transportation. See, C. Weber and H. Matthews, *Food-Miles and the Climate Impacts of Freight Transportation in American Food Consumption*, *Environmental Science & Technology* (2008), summarized at http://news.mongabay.com/2008/0602-ucsc_liaw_food_miles.html.

4 G. Feenstra, *Creating Space for Sustainable Food Systems: Lessons from the Field*. Agriculture and Human Values, 2002, p. 96.

5 Also available on the web sites of American Farmland Trust, www.farmland.org, and Sustainable Agriculture Education (SAGE), www.sagecenter.org

6 For a good explanation of sustainable agriculture, see G. Feenstra, et al., *What Is Sustainable Agriculture?*, University of California Sustainable Agriculture Research and Education Program (SAREP), 1997, http://www.sarep.ucdavis.edu/concept.htm; and see the definition adopted by Congress in the Food, Agriculture, Conservation and Trade Act of 1990, Public Law 101-624, Title XVI,

of agricultural production eliminate or reduce the use of synthetic chemicals and energy-derived fertilizers, and avoid cultural practices that deplete the soil, harm wildlife and create air and water pollution. The avoidance of pesticides and other chemicals, which may remain on or in food produced with them, can also benefit the health of those who consume it. And to some consumers the sustainability of agricultural methods also embraces fair farm labor practices and animal welfare.

Finally, the concept of "local" food seems to extend to who produced it. This can include not only the identity of the grower, but also his or her personality and ethics, the attractiveness of the farm or ranch and its surrounding landscape, and other intangibles that make up the "story behind the food." In the world of fine art, the word "provenance" is often used to describe the history of a painting or other art object that attests to its authenticity; a history that not only allows it to be traced to its originator, but also, in effect, becomes part of the art object itself. That concept, applied to food, seems to capture the essence of what many consumers are looking for when they decide to eat locally.

The San Francisco Foodshed

For the purpose of investigating how much local food is produced around San Francisco, we had to circumscribe a study area that would define what is local and what is not. We chose an area encompassing all counties, at least part of which fall within a 100-mile radius of the Golden Gate (see centerfold map). This wasn't as arbitrary as it might sound, for it seems to have currency with consumers who seek out local food. The Locavores, for instance, is a Berkeley-based organization that has challenged people in the Bay Area to eat food grown within 100 miles of home.[7] Random House Canada recently published a book titled *The 100-Mile Die: A Year of Local Eating.*[8] And according to a recent survey by the Hartman Group, when asked to define local food products, more consumers chose "within 100 miles" than any other distance.[9]

In this report, we call this 100-mile radius the San Francisco "foodshed" study area. The term "foodshed" itself was apparently coined in 1929 by Walter Hedden in his book *How Great Cities Are Fed*, and popularized in the early 1990's by Arthur Getz,[10] who used the analogy of a watershed to describe "the area that is defined by a structure of supply." According to Getz, the concept helps explain "Where our food is coming from and how it is getting to us." Inherent in the concept, he emphasized, was 'the suggestion of a need to protect a source, as well as the need to know and understand its specific geographic and ecological dimensions, condition and stability in order for it to be safeguarded and enhanced."[11] When viewed from this perspective, the term "foodshed" seems to fit nicely with the broadest definition of local food suggested above.

Could the City of San Francisco feed itself entirely from what is produced by farms and ranches within 100 miles of the Golden Gate?

That is the question we asked when we embarked on this assessment of the City's foodshed. And the answer, it seems, is a qualified "yes." On the whole, northern California farms and ranches within 100 miles of the Golden Gate produce far more food than San Francisco and, indeed, the entire Bay Area consume. But despite a growing season that is longer than in most regions of the county, there are few crops that can be produced in the region year-round. And some basic commodities like wheat, for example, are not produced in abundance in the region, mainly because other crops like fruits and vegetables yield higher economic returns to growers.

Subtitle A, Section 1603, in *Sustainable Agriculture: Definitions and Terms*, compiled by Mary V. Gold, National Agricultural Library, 1999, http://www.nal.usda.gov/afsic/pubs/terms/srb9902.shtml

7 See, http://www.locavores.com/

8 A. Smith and J. MacKinnon, *The 100-Mile Diet: A Year of Local Eating,* Random House Canada (2007); and see the authors' web site, http://100milediet.org/

9 The Hartman Group. *Consumer Understanding of Buying Local*. 2008, http://www.hartman-group.com/hartbeat/2008-02-27

10 Attributed to Getz's article *Urban Foodsheds*, in J. Kloppenberg, Jr., et al., *Coming into The Foodshed*, Agriculture and Human Values 13:3, 1996, p. 33. The authors say that the term may actually have originated as far back as 1929.

11 Permaculture and Regenerative Design News, http://kjpermaculture.blogspot.com/2008/01/foodsheds-and-food-circles.html

Though regional agriculture is capable of meeting much of the dietary needs of the City, not all of the food now consumed by its roughly 744,000 residents and 330,000 daily visitors comes from within a 100-mile radius. And, more to the real point of our study, the local food sector of the agricultural economy of northern California is today but a small fraction of its total production capacity. There is, in short, a lot more potential for the City and all Bay Area communities to take advantage of the cornucopia around it to improve their diet, support local farmers and, by choosing fresh produce in season and reducing the distance their food travels from farm to fork, minimize their impact on natural resources and the environment.

The main purpose of this study was to explore how San Francisco could increase the amount of locally-produced food it eats, if not to the level of regional self-sufficiency, at least to the point where it will demonstrably improve the City's quality of life while reducing its impact on the environment. The statistics we assembled help define the opportunity and the challenge, and are supplemented by more anecdotal information and opinions we gathered from experts about what it will take to create a more robust, sustainable local food system within 100 miles of the Golden Gate.

What are the specific obstacles to increasing local production of commodities for local, as opposed to global, markets? What are the challenges of distributing healthy, local produce, not only to the well-off, but to the substantial proportion of San Francisco's population that lives on the edge of poverty? What opportunities are there to increase the interest of all City consumers in locally-grown food and – this is why American Farmland Trust undertook this study – to conserve the land from which it comes?

Geographic Scope of the Study

Our original intention was to focus on food consumption only within the city of San Francisco. We considered looking at the entire Bay Area, but decided that it was simply too big, given the resources available to conduct the study. As it turned out, the only way to estimate food consumption in the City without going to great expense was to use national and regional averages. So, in fact, the consumption data we have assembled for San Francisco can be and, as you will see, have been extrapolated to the surrounding Bay Area communities to illustrate the potential of the entire region to "eat locally."

The production side of the study encompasses 25 counties, all or part of which fall within 100 miles as-the-crow-flies from the Golden Gate. In truth, San Francisco, like most American cities, looks to a much larger area for its food supply. As explained above, our decision to circumscribe a smaller area was based on the popularity of the 100-mile radius as an indicator of local food. It was not intended to slight the agricultural producers farther from the City, including those in both Fresno and Tulare, the nation's number one and number two farm counties, with a combined production total almost equal to the 25 counties we did study. Ultimately, the lessons drawn from examining the characteristics and challenges of agricultural production within 100 miles almost certainly apply to the area beyond where agriculture is similar to that closer to San Francisco.

Our Approach to the Research

The study has three basic parts: The first is a statistical analysis of food production within 100 miles of the Golden Gate, the resource base from which it comes, and food consumption in the City of San Francisco and the Bay Area. Second, we reviewed publications, web sites and other documents, and interviewed informed people to get a picture of how food moves from farms to consumers, as well as of the organizations that are working to promote more locally-grown and -marketed food in the region. Finally, we used the same approach to investigate the obstacles to, and opportunities for, expanding both local consumption of locally-produced food and the production of locally-grown food specifically for local consumers.

An important subsidiary issue we looked into is the extent to which local production consists of organic and other "sustainably" produced foods and the size of the market for them in the City. Agricultural production practices that minimize the use of pesticides and other fossil fuel inputs have a bearing on the impact that local food production and, by implication, consumption have on both human health and the environment. And such practices – along with the ability to trust that they were used – are undeniably part of the consumer appeal of local food. Our

intention in studying this issue was not to pass judgment, one way or another, on sustainable agriculture, but simply to try to document both its current extent and potential in the region. In the end, we didn't turn up much information on this issue, illustrating another central purpose of our study, namely, to identify gaps in our knowledge about the San Francisco foodshed that could be filled by additional research.

Most of the agricultural production data in this study came from the annual reports compiled by the Agricultural Commissioners in each California county.[12] These are quite detailed and appear to be the most reliable source of information on the production of specific commodities. However, these reports do not track where crops and livestock products are marketed. So, there is a critical gap in our knowledge about where locally-produced food is consumed – in effect, about how much the circles overlap. The only source of statistical information we could find on the production of food that is presumably marketed and consumed locally is the U.S. Census of Agriculture, which tracks the value of agricultural products sold directly to consumers, as opposed to wholesalers and other distributors. And this information does not pinpoint the location of such consumers, making it impossible to determine how much was purchased directly by people who live in or visit the City of San Francisco, rather than by those who live elsewhere in the region.

A key part of the study is an examination of the farmland from whence comes locally-produced food. The most reliable data on land use is provided by the Farmland Mapping & Monitoring Program (FMMP) of the Division of Land Resource Protection at the California Department of Conservation. This program is arguably the best of its kind in the nation, updating land use trends on a parcel-by-parcel basis every two years using aerial photography. The most recent land use data we have for all counties in the San Francisco foodshed study area (except Calaveras and Mendocino Counties) is from 2004 and the earliest is from 1990, so we used the period between these two dates to track land use changes.[13]

Despite our best efforts, like other researchers before us, we could find no reliable data on food consumption specifically for the City of San Francisco or other communities in the Bay Area. The data on food consumption we used in this report were derived from national and regional statistics on food availability, dietary patterns, and consumer spending patterns. These statistics are prepared by the U.S. Department of Agriculture and the Bureau of Labor Statistics. Consumer expenditures on food are tracked as part of the Consumer Expenditure Survey, an ongoing survey of spending patterns. The results of this survey are published for "Metropolitan Statistical Areas"; the San Francisco MSA includes much of the greater Bay Area, but likely provides a good estimate of consumer spending patterns in San Francisco itself. The total food supply data, known as the Loss-Adjusted Food Availability Data is estimated at the national level by compiling records of all food produced in the U.S., adding imports and subtracting exports, then applying estimates of losses due to spoilage, waste, and other losses. These data are available only at the national level. Finally, the dietary intake data we used come from the Food Commodity Intake Database, which is built using results from the Continuing Survey of Food Intake by Individuals and its Supplemental Children's Survey. We used the dataset for urban residents in the Western United States region.

Ultimately, this study had to address very complex issues with limited resources. It was not intended to be as comprehensive as similar efforts to analyze local food systems.[14] Rather, it was designed primarily to take a snapshot of local food production, distribution and consumption; to identify information gaps; and to investigate the basic challenges and opportunities associated with expanding both the production and consumption of locally-grown food in the region.

12 For a list of county agriculture commissioner contacts, see http://www.cdfa.ca.gov/exec/county/County_Contacts.html Annual crop reports are available on the web site of each commissioner.

13 Farmland Mapping & Monitoring Program data are analyzed by American Farmland Trust in *Paving Paradise: A New Perspective on California Farmland Conversion* (2007), http://www.farmland.org/programs/states/ca/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf

14 See, e.g., San Francisco Food Systems, *San Francisco Collaborative Food System Assessment* (2005); S. Unger and H. Wooten, U.C. Berkeley Dept. of City & Regional Planning for the Oakland Mayor's Office of Sustainability, *A Food Systems Assessment for Oakland, California: Toward A Sustainable Food Plan* (2006); J. Anderson, G. Feenstra and S. King, U.C. Davis Sustainable Agriculture Research & Education Program, *Stanislaus County Food System Project* (2002).

Agricultural Production Within the San Francisco Foodshed

An Astonishing Cornucopia

Few other cities in America or, for that matter, the world are as blessed as San Francisco when it comes to its potential to draw sustenance from local sources of food. The surrounding area – see the map in the center of this report – is a vast cornucopia distinguished by its mild, Mediterranean climate, fertile soils, well-developed (though problematic) sources of water and a sophisticated, entrepreneurial group of farmers and ranchers.

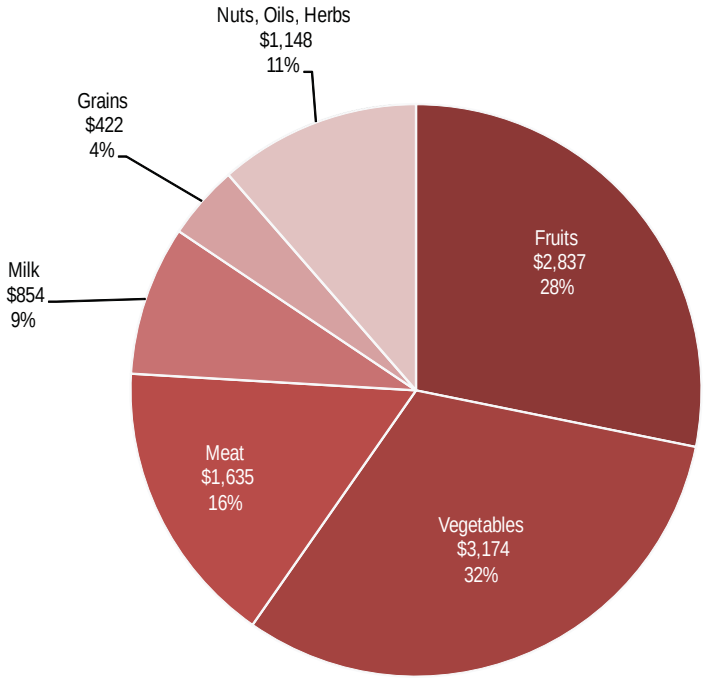
Twenty million tons of food a year are produced on the roughly ten million acres of agricultural land within 100 miles of the Golden Gate – many times more than San Francisco or the Bay Area could consume.[1] This includes more than 80 different crops and livestock products, not counting their myriad varieties. (Appendix 1, Table A1.1) When they leave the farm gate, i.e., before they are processed and sold to consumers, they bring in $10 billion a year, more than a quarter of California's total agricultural output. If the San Francisco foodshed study area were a state, only Texas, Iowa and California itself would rank higher in farm production.

Well-Balanced Diversity Across Food Groups

Production is well-diversified across the major food groups that make up a healthy diet, with vegetable and fruit crops – the ones your mother made you eat -- each accounting for about one-third of the total farm gate value of production. (Figure 2.1; Appendix 1, Table A1.2) Meat and dairy products together make up about one-quarter of the total, and nut crops just over one-tenth.

The only major food group not produced in relative abundance in the region is grain (corn, wheat, rice, etc.), which accounts for only four percent of the total production value of the region. This is easily explained by the fact that fruit, vegetable and nut crops yield higher per acre returns to growers and can be produced throughout much of the region.

Figure 2.1: 2006 Value of Agricultural Production by Food Group in Millions of Dollars

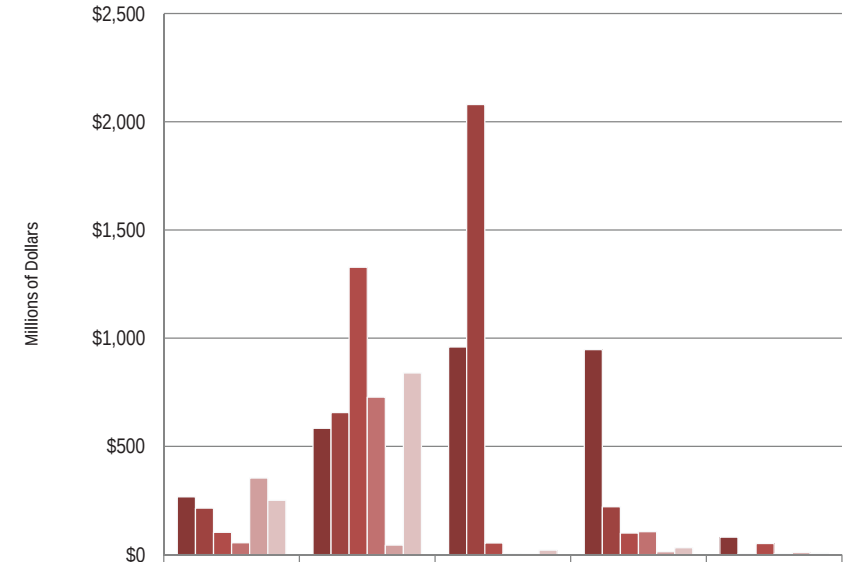


Source: County Agriculture Commissioner Reports

Production appears somewhat less diversified when viewed from the perspective of volume as measured by weight. (Appendix 1, Table A1.3) Vegetables account for almost 60 percent of total volume and milk increases to one-fifth of total commodity output. This is probably

1 To put this in perspective, and to anticipate the chapter on food consumption, San Franciscans consume about one million tons of food annually and the entire Bay Area consumes a total of 6.4 million tons.

Figure 2.2: Subregional Breakdown of Agricultural Production Value within the San Francisco Foodshed Study Area



	Sacramento Valley	San Joaquin Valley	Central Coast	Bay Area	Other
Fruits	$267	$584	$959	$947	$81
Vegetables	$215	$656	$2,079	$221	$3
Meat	$103	$1,328	$54	$100	$51
Milk	$54	$728	$4	$106	$3
Grains	$353	$44	$3	$13	$9
Nuts, Oils, Herbs	$251	$839	$20	$32	$6

Source: County Agriculture Commissioner Reports

Table 2.1: Commodities in which Bay Area Counties Lead in Production

Commodity	County
Brussel Sprouts	Santa Cruz
Chinese Vegetables	Santa Clara
Garlic	Santa Clara
Olives	Napa
Prunes	Solano
Seafood	Sonoma
Watermelons	Solano
Wine Grapes	Napa

Source: County Agriculture Commissioner Reports

explained by the fact that fluid milk weighs a lot and that, pound for pound, fruits tend to cost more than vegetables.

Most Agricultural Production in the San Francisco Foodshed Comes From the Valleys beyond the Bay Area

Most agricultural production by value and volume comes, not from the immediate Bay Area, but from the fertile valleys beyond the hills surrounding San Francisco and its neighboring communities. The seven Central Valley counties within the foodshed study area produce more than half of the total value of agricultural products in the region. (Figure 2.2)[2] By contrast, the eight Bay Area counties account for only 14 percent of total agricultural production in the study area. One-third of that comes from the highly valuable wine grape crops in Napa and Sonoma Counties, though Bay Area counties are also the leading producers of several other commodities. (Table 2.1)

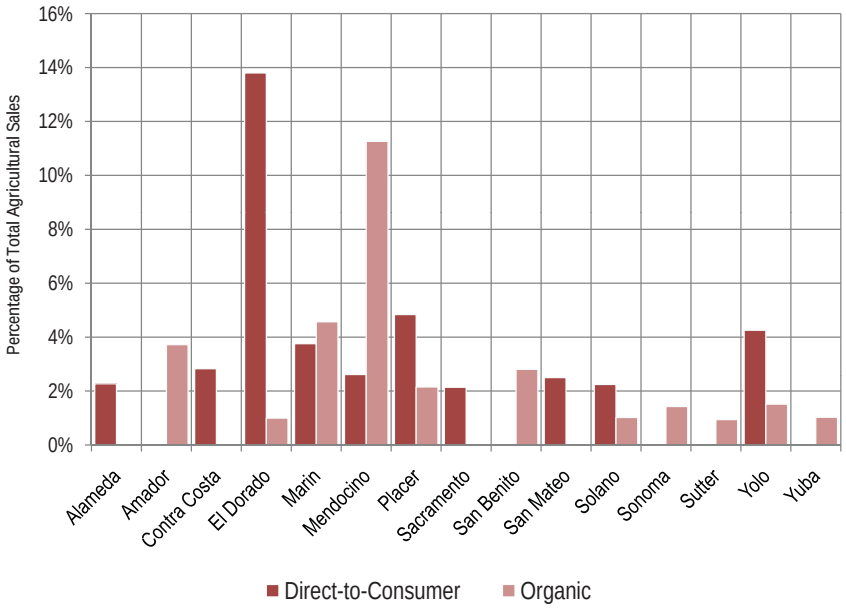
Monterey County, with its huge produce industry, is by far the highest grossing agricultural county within the foodshed and the third highest in California. There, the incomparable Salinas Valley – the nation's "salad bowl" – accounts for one-third of the entire vegetable output of the study area. The San Joaquin Valley counties of San Joaquin and Stanislaus are also among the top ten producers in the state and account for 80 percent of the milk production in the foodshed study area. With the exception of grains (particularly rice produced in the Sacramento Valley) and produce from the central coast, the Central Valley accounts for the highest percentage of all other food groups.

2 Counties included in the subregions (within 100 miles of the Golden Gate) are: Sacramento Valley - Colusa, Sacramento, Sutter, Yolo, Yuba. San Joaquin Valley - Merced, San Joaquin, Stanislaus. Central Coast - Monterey, San Benito, Santa Cruz.
Bay Area - Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, Sonoma. Other - Amador, Calaveras, El Dorado, Lake, Mendocino, Placer.

Direct-to-Consumer and Organic Foods Are A Growth Industry But Remain a Small Percentage of Overall Agricultural Production

The production of food for sale directly to consumers through farmers markets, farmstands, CSAs (community supported agriculture[3]) and other outlets is a growth industry in the San Francisco foodshed study area. Between 1997 and 2002, as reported by the U.S. Census of Agriculture, direct-to-consumer sales in the region[4] increased 45 percent or about 9 percent per year, from $37 million to $54 million annually. (Appendix 1, Table A1.4) Nevertheless, the sale of food directly by producers to consumers represents only about three-quarters of one percent of overall agricultural production value within the study area.[5] (Figure 2.3)

Figure 2.3: Leading Counties in Direct and Organic Sales as Percentage of Total Agricultural Sales



Source: U.S. Census of Agriculture, 2002

Organic food production in the San Francisco foodshed study area, also by coincidence $54 million in 2002, is likewise a small fraction of total agricultural output. (Figure 2.3; Appendix 1, Table A1.4) A significant percentage of direct-to-consumer sales is probably organic produce, but Census of Agriculture data do not reveal the overlap. Since organic sales data are not available for 1997, the rate of growth in this segment of the industry cannot be calculated for our study area, though national studies suggest that between 1998 and 2006, sales of organic food grew at an average annual rate of 18.6 percent[6]. As another measure of the penetration of organic or "sustainably" grown food into the overall marketplace in the region, the Community Alliance with Family Farmers (CAFF), a leading sustainable agriculture organization, lists 374 farms and ranches that have pledged to produce using sustainable agriculture practices. Though this probably does not include all sustainable producers within the San Francisco foodshed study area, it constitutes one percent of the 33,600 farms in the region.

Where is Locally-Produced Food Consumed?

Though we know quite a bit about what is grown in the San Francisco foodshed study area, we have little information about where it is shipped, processed and consumed. As we will learn in the chapter on the regional food system, the place where food is grown is not very important – and may even be a liability – to distributors and retailers whose principal objective is to market uniform products year-round. So, the origin of food is either not tracked or is considered proprietary by the industry, to be used only in cases where, for example, it may be needed

3 Community supported agriculture describes subscription services whereby consumers purchase fresh produce directly from local producers who make weekly deliveries to their homes or neighborhoods. See, e.g., Farm Fresh to You, http://www.farmfreshtoyou.com/index.php

4 Note that this includes commodities produced for direct sale to consumers *throughout* the region, not just within the City of San Francisco, for which specific data are not available. The U.S. Census of Agriculture is the most reliable source of data on direct-to-consumer sales and organic sales. We used the latest published Census of Agriculture data for 2002. A new census was taken in 2007 and is expected to be released this year.

5 Estimated 2006 value of direct-to-consumer sales based on a continuation of the 1997-2002 trend is about $73 million.

6 Derived from Organic Trade Association's 2007 Manufacturer Survey. Packaged Facts. http://www.ota.com/pics/documents/2007ExecutiveSummary.pdf

to trace contaminated food back to its source. It is safe to say, however, that a great deal of what is produced in the foodshed study area is *not* consumed in San Francisco or, indeed, within the entire 100-mile radius of the City. On the whole, about 40 percent of California's agricultural production is exported to the rest of the country or abroad, while somewhere around one-quarter of the food consumed in the state is imported from outside the United States.[7] The production and consumption patterns within our study area are probably not much different.

7 K. Meter, *Finding Food in California: Local Gains, Systemic Losses*, Roots of Change Vivid Picture Project, 2004, at 5.3, http://www.vividpicture.net/documents/5_Finding_Food_in_California.pdf; and see, K. Mamen, et al., *Ripe for Change: Rethinking California's Food Economy*, International Society for Economy and Culture, 2004, http://www.isec.org.uk/articles/RipeForChange.pdf

Agricultural Land Resources In the San Francisco Foodshed Study Area

Local food depends on local farmland

The concept of a foodshed connects food with its origin; with the land, the resource from which it comes. So, if we want to understand the San Francisco foodshed, it is important to examine the scope and characteristics of the agricultural resource base – shown on the map in the center of this report -- that is the foundation of the great bounty produced by farmers and ranchers in the region. Quite simply, it is local farmland that makes local food possible.

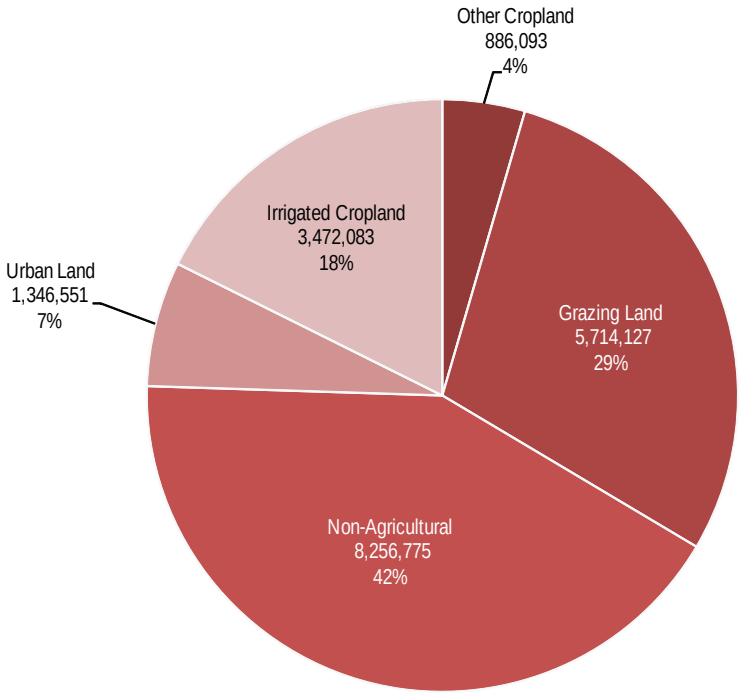
The San Francisco Foodshed is a Diverse Agricultural Resource

Within the San Francisco foodshed study area are a variety of different agricultural sub-regions. By far the most important from the standpoint of total agricultural production is the Central Valley, which American Farmland Trust has ranked as the most productive and most threatened agricultural area in the United States.[1] It is actually composed of two broad river valleys that join at the Sacramento-San Joaquin Delta, from whence the two rivers, the Sacramento from the north, the San Joaquin from the south, flow west into San Francisco Bay. (In this sense, one can think of the Central Valley as the "Golden Gate watershed.") The Sacramento Valley is generally cooler and has a steadier supply of water than the San Joaquin, where agriculture depends almost entirely on irrigation. Together they produce some 300 different crops valued at more than $20 million (though almost half of this comes from Fresno and Tulare Counties, which are not within our study area, even though they do supply food to the City).

East of the Central Valley, the Gold Country is a surprisingly productive agricultural sub-region. There, cattle ranching predominates in the Sierra foothills, but fruit crops like apples have also been traditionally grown in some areas and wine grapes have gained a foothold in more recent years.

On the shore of Monterey Bay south of San Francisco is another incredibly productive, indeed, unique agricultural region, the Salinas Valley – celebrated by Steinbeck in *East of Eden* -- and its smaller cousin the Pajaro Valley.

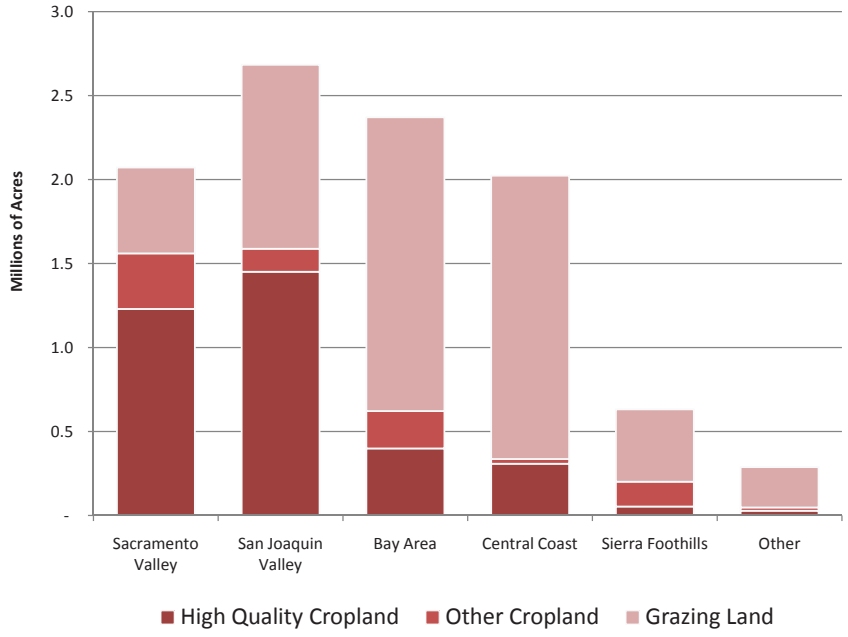
Figure 3.1: Land Within the San Francisco Foodshed Study Area: Type, Acreage, Percentage of Total Area



Source: Farmland Mapping & Monitoring Program, Department of Conservation, California Resources Agency, 2004

1 See, Farming on the Edge, http://www.farmland.org/resources/fote/states/default.asp

Figure 3.2: Distribution of Agricultural Land Within the San Francisco Foodshed Study Area



Source: Farmland Mapping & Monitoring Program, Department of Conservation, California Resources Agency, 2004

Irrigated Cropland Is the Scarcest and Most Valuable Resource

A surprisingly small percentage of the land in the San Francisco foodshed study area is responsible for its agricultural fecundity. Although there are roughly 30,000 square miles (ten million acres) of land within the 25 counties that lie at least partially within 100 miles of the Golden Gate, only half of this land is used for agriculture. The rest is forest, mountains, wetlands or developed for urban uses. (Figure 3.1)

Of all the agricultural land within the study area, only about one-third (3.5 million acres) is high quality, irrigated cropland, located primarily on the floors of the Sacramento, San Joaquin and other smaller valleys. (Figure 3.2) This land typically has fertile soils, abundant water and produces the most valuable and widest variety of crops, including almost all of the fruits and vegetables grown in the region. With its mild Mediterranean climate – California is one of only five places in the world blessed with such a climate[2] – the region's irrigated cropland is considered the most important for agriculture.[3] That is not to say that the other agricultural land within the foodshed is unimportant. Most of it is grazing land that is the source of meat and dairy products. But while these commodities can be produced virtually anywhere, fruits, vegetables, nuts and other specialty crops can be grown only on the region's relatively scarce irrigated cropland.

The climate of both is influenced by the coastal marine layer, resulting in frequent fog and cloud cover.This is ideal for growing lettuces, other leafy greens and tender vegetables, including artichokes. This region is the nation's "salad bowl," producing some of the highest per acre crop returns of any land on earth.

The Bay Area itself once resembled the coastal valleys to the south but, of course, much of what was once unique farmland has been developed. The poster child for what has happened to agriculture in this region is the transformation of what was once known as the "Valley of Heart's Delight," because of its extensive fruit orchards, into Silicon Valley. Yet in the North Bay, abundant specialty crops, notably vinifera grapes, continue to be grown in the Napa, Sonoma and other valleys influenced by the coastal climate. And milk and other dairy products are still produced in the hills of Marin, Sonoma and other Bay Area counties.

2 Others include parts of Chile, Australia, South Africa and the Mediterranean littoral itself.

3 The Farmland Mapping & Monitoring Program of the California Department of Conservation produces "Important Farmland" maps that classify land based on its soils, availability of water and other factors. High quality irrigated farmland falls into three categories: prime, unique (especially suited for fruit production) and farmland of statewide importance. See, http://www.consrv.ca.gov/dlrp/FMMP/Pages/index.aspx

Development is an Increasing Threat to Agriculture in the Foodshed

Though agricultural land in the San Francisco foodshed study area is expansive, it is not unlimited. As in much of California, urban and rural development are steadily encroaching on farmland within the region, shrinking the available resource base, inflating the value of land above what agriculture can afford and creating land use conflicts that increase the costs and risks of farming.[4]

There are various ways to gauge the impact of development, past and future, on farmland and, hence, the agricultural production capacity of a county or region. Among the most telling are the total amount of land developed, the agricultural importance or quality of the land developed, and the efficiency with which it is developed (measured by the number of people accommodated for each acre converted from agricultural to urban use). Within the San Francisco foodshed study area, 1.35 million acres (2,100 square miles) of land have been developed,[5] about 12 percent of the land that was or could be farmed. (Table 3.1) That's a significant amount but, by itself, this loss is probably not enough to be cause for concern. However, one out of seven acres of the urban land in the foodshed study area has been developed just since 1990. That's six times the area of the City of San Francisco and represents a 60 percent increase in the annual rate of land conversion over the historical average. Thus, farmland conversion is accelerating, particularly in the agricultural heartland of the San Joaquin Valley, where, for every four acres developed prior to 1990, another has been developed since then – a very dramatic increase that seems to correspond with a spillover of population from the Bay Area due to its soaring housing prices.

Table 3.1: Amount of Land Urbanized in the San Francisco Foodshed Study Area

Sub-Region	Acres of Urbanized Land in 2004	Percentage of Total Land Area Urbanized by 2004	Percentage of All Urban Land Developed Since 1990
Sacramento Valley	223,426	8.0%	11%
San Joaquin Valley	179,523	5.8%	22%
Bay Area	745,025	16.9%	10%
Central Coast	93,358	2.8%	17%
Sierra Foothills	90,777	3.0%	36%
Other **	14,442	0.5%	12%
Total	1,346,551	6.8%	14%

** Includes only Lake County. No data for Mendocino.

Source: California Department of Conservation, Farmland Mapping & Monitoring Program, as interpreted in *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007)

Table 3.2: Quality of Land Urbanized in the San Francisco Foodshed Study Area

Sub-Region	High Quality Cropland As Percentage of All Land Developed 1990-2004	Acres of High Quality Cropland Remaining Per Acre of Urban Land
Sacramento Valley	37%	5.5
San Joaquin Valley	76%	8.1
Bay Area	22%	0.5
Central Coast	36%	3.3
Sierra Foothills	3%	0.6
Other **	4%	2.0
Total	33%	2.6

** Includes only Lake County. No data for Mendocino.

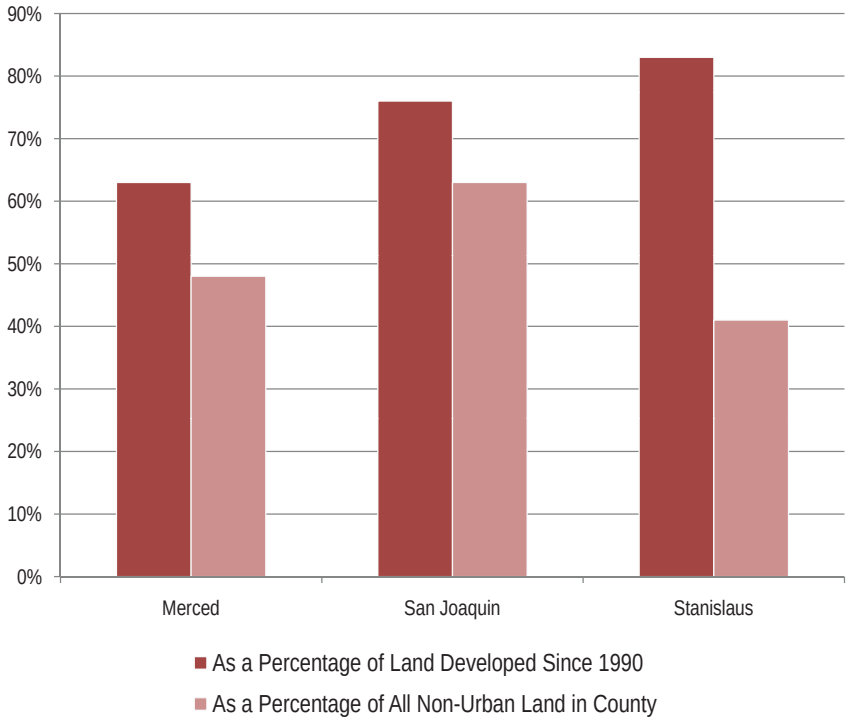
Source: California Department of Conservation, Farmland Mapping & Monitoring Program, as interpreted in *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007)

If we look at the agricultural importance of the land being developed in the region, the picture becomes more troubling. (Table 3.2) One third of all the land developed since 1990 was high quality irrigated cropland – the best in the state, if not the world – so that, today, only 2.6 acres of this land remain for every acre that has been paved over. In the San Joaquin Valley, which produces more than 40 percent of the agricultural output of the study area, high quality cropland comprised 76 percent of all land developed. One explanation for this astonishing figure is that a high percentage of all the land in this sub-region is high quality cropland. But, even so, development is being

4 For a comprehensive picture of what is happening to farmland and why in the Central Valley, see *The Future Is Now: Central Valley Farmland at The Tipping Point* (American Farmland Trust, 2006), http://www.farmland.org/programs/states/futureisnow/default.asp For an even more up to date picture of farmland trends statewide, see *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007), http://www.farmland.org/programs/states/ca/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf

5 The latest comprehensive statewide data available on farmland development is from 2004, which is used for all calculations of development to date.

Figure 3.3: High Quality Farmland in the San Joaquin Valley Within the San Francisco Foodshed Study Area



Source: Farmland Mapping & Monitoring Program, Department of Conservation, California Resources Agency, 2004

disproportionately sited on the best land. (Figure 3.3), mainly because the cities in this region, as they are in much of California, are surrounded by it.

The coincidence of development pressure and high quality farmland places a premium on how much land is being urbanized *per capita*, making this perhaps the most critical measurement of the impact of development on farmland. While population is practically impossible to control, and the proximity of high quality farmland to cities gives cities few options for avoiding its conversion, the way the land is developed is completely within our control – or, at least, the control of local elected officials. It is, therefore, disheartening that the land within the San Francisco foodshed study area is being developed very inefficiently, consuming far more land per person than is necessary to maintain economic growth or the quality of life Californians expect. (Table 3.3)

Throughout the foodshed study area, an acre of land is being developed for every 9.7 new residents.[6] (To get an idea of how spread-out that is, imagine a couple five-person touch football teams playing on the gridiron at Candlestick.) The Bay Area is doing somewhat better, mainly because the compact development in its big cities offsets the very low efficiency of development on its outskirts. Contra Costa, Marin and Sonoma, for example, all fall within the range of five to seven people per acre developed, as does the development on the Central Coast, in the Sierra foothills and in the Sacramento Valley outside Sacramento County itself.[7]

Sacramento County stands out because its recent development efficiency (20.6 people per acre) is more than twice the average for the foodshed study area, illustrating the possibilities of saving farmland while still accommodating significant growth in an attractive, livable manner.[8] Meanwhile, the San Joaquin Valley appears to be developing land a bit more efficiently than average primarily because cities in Stanislaus County are developing only four acres for every five developed in San Joaquin County, and three for every four developed in Merced. That may not sound like much of a difference, but it has saved 32,000 acres (50 square miles) of Stanislaus farmland since 1990.

If the current development trend continues, the San Francisco foodshed study area will lose an additional 800,000 acres of farmland by 2050, expanding the existing urban "footprint" by another 60 percent. At least one-third of this is likely to be the kind of high quality

6 This calculation divides the increase in population 1990-2004 by the number of acres of land developed during the same period. The land developed includes, not just homes, but all commercial and government buildings, and all urban infrastructure such as roads, canals, parks and public utilities – because they all convert farmland.

7 See, American Farmland Trust, *Paving Paradise: A New Perspective on California Farmland Conversion*, 2007, http://www.farmland.org/programs/states/ca/documents/PavingParadise_AmericanFarmlandTrust_Nov07

8 The approximate density of the City of San Francisco itself is about 26 people per acre.

irrigated cropland that now produces the widest variety of fresh fruits, vegetables and other locally-grown foods. If, on the other hand, more local communities were to emulate growth patterns in Sacramento County – where a regional "blueprint" planning process promises to increase development efficiency even farther[9] -- almost a half million acres could be saved within the next generation.

Agriculture in the San Francisco Foodshed Study Area Faces Other Resource Challenges

Land is fundamental to food. But other factors have a powerful influence on both the physical capacity to grow it and the economic viability of agricultural production, whether for local or global markets. We cannot elaborate on all of them here, but will highlight the most significant ones.

Water is critical to agriculture in the semi-arid climate that predominates throughout the San Francisco foodshed and most of California. Our state has been called a "vast plumbing system" because so much of the water used by agriculture, industry and residents comes from impoundments, canals and other conveyances that move huge volumes of it great distances. Since the days when this system was first being developed, there has been competition between agricultural, urban and environmental water users. John Muir saved Yosemite, but regretted the loss of nearby Hetch Hetchy Valley to a reservoir that still serves the City of San Francisco. Today, the controversy continues over whether new dams or conservation – including the possible withdrawal of water from agriculture – is the solution to the state's growing water needs. The prospect of climate change makes the debate even more important. Global warming could not only cause a rising Pacific to submerge the Sacramento-San Joaquin Delta, through which a great deal of the state's fresh water is pumped, it could also shrink the state's biggest reservoir – the winter snowpack in the Sierra.[10]

Table 3.3: Development Efficiency and Future Development in the San Francisco Foodshed Study Area

Sub-Region	Efficiency of Urban Development (People Per Acre Developed 1990-2004)	Projected New Development by 2050 (Acres)	Percentage Increase in Urban Land by 2050
Sacramento Valley	15.0*	138,458	62%
San Joaquin Valley	9.2	217,755	121%
Bay Area	10.7	302,664	41%
Central Coast	6.2	56,031	60%
Sierra Foothills	5.4	85,132	94%
Other **	4.8	4,804	33%
Total	9.7	804,844	60%

** Includes only Lake County. No data for Mendocino.
* Without Sacramento County, efficiency of development in the Sacramento sub-region is 6.9 people per acre.

Source: California Department of Conservation, Farmland Mapping & Monitoring Program, as interpreted in *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007)

Two other pressures on agriculture in the San Francisco foodshed deserve special mention. First, invasive species like the Mediterranean fruit fly and little brown apple moth, which attack food crops, appear to be getting more prevalent as global trade expands. Their control has caused controversy – even though it now emphasizes biological agents rather than pesticides -- because to be effective the sprays must include fruit trees in urban backyards as well as in agricultural areas.

The second issue is competition between agriculture and wildlife habitat. This controversy affects cropland more than grazing land. For example, some tree and vine crops have been excluded from agricultural lands in the Sacramento area because they interfere with the ability of the threatened Swainson's hawk to hunt prey. And orchards have been removed from some lands in the Delta in favor of grain crops that are less valuable to growers, but more valuable to migratory waterfowl.

Complicating the cropland-habitat issue further is the recent concern over the safety of spinach and similar crops due to *e. coli* contamination found on a farm in San Benito County. The so-called "leafy greens" intitiative, calling for the removal of vegetation around fields where these crops are grown, could eliminate both wildlife habitat

9 Sacramento Area Council of Governments, Sacramento Region Blueprint Transportation and Land Use Study, http://www.sacregionblueprint.org/sacregionblueprint/home.cfm

10 See, e.g., U.C. Davis Climate Change Center, http://climatechange.ucdavis.edu/agriculture.html

and a source of beneficial insects vital to integrated pest management (IPM) systems that are the hallmark of organic and “sustainable” agriculture.

To be sure, most of these issues arise from the demands of the highly industrialized agricultural system that has emerged since World War II in California and much of the rest of the nation. People are questioning whether this system is both desirable and sustainable over the long run. Modern agriculture has basically substituted fossil fuel-based technology for human labor and land. How much longer this can continue is anybody’s guess. No less a technocrat than Henry Ford warned, “The farther we get from the land, the greater our insecurity.”

Food Consumption in San Francisco and the Bay Area

We are what we eat, as individuals and as a society

It is challenging to determine the origin of locally-consumed food, just as it is difficult to determine where food grown in the San Francisco foodshed study area is ultimately consumed. Estimates vary, but what is evident is that agriculture in the study area can more than provide for the needs of San Francisco. Feeding the entire Bay Area is more complicated, but most of its needs could be met by farms and ranches within 100 miles of the Golden Gate. A big challenge to increasing consumption of healthy, locally-produced food is increasing consumer demand, including that of low-income consumers who do not have easy access to affordable food.

Millions of Tons Consumed Annually

Our best estimate is that consumers in San Francisco eat about one million tons of food a year, and the entire Bay Area consumes 6.4 million tons. These figures are calculated using two national databases administered by the U.S. Department of Agriculture: the *Loss-Adjusted Food Availability Data* which estimates the total food supply, and the *Food Commodity Intake Database* (FCID), which is based on surveys of dietary intake.[1] The food supply data give an estimate of how much food is consumed after accounting for loss and waste. This estimate includes figures for the weight of food at the farm gate (*primary weight*) and the weight of food at the table (*consumer weight*). Consumer weight estimates suggest that there are 1,423 pounds of food available for every consumer[2], while the dietary survey data suggests that each consumer only eats 794 pounds of food[3]. Table 4.1 compares consumption estimates from these two sources; true consumption figures are likely between these two estimates. The food supply estimate uses rough estimates of how much food is lost between farm and plate, while the dietary survey is limited by reporting errors: consumers tend to report eating less than they really do, particularly of "bad" foods.[4] Figure 4.1 illustrates the differences between food supply "consumer weight" estimates and dietary survey estimates for every food group. For more detail see Table A2.1 in Appendix 2.

We used the highest per capita figures to calculate total food consumption in the region, so that a comparison with agricultural production would not overestimate the

Table 4.1: Per Capita Consumption Estimates by Food Group, in Pounds

	Loss-Adjusted Food Availability Data		FCID (Dietary Surveys)
Food Group	Primary Weight (lbs)	Consumer Weight (lbs)	Dietary Survey Weight (lbs)
Fruits	266	175	202
Vegetables	350	238	106
Protein	546	416	87
Milk	284	252	248
Grains	161	142	74
Nuts, Oils, Herbs	95	75	26
Sugars*	141	125	52
Total	1,842	1,423	794

* Not recorded in Ag Commissioner production data

Source: Derived from Loss-Adjusted Food Availability, USDA/Economic Research Service; Revised Food Commodity Intake Database, USDA/Agriculture Research Service.

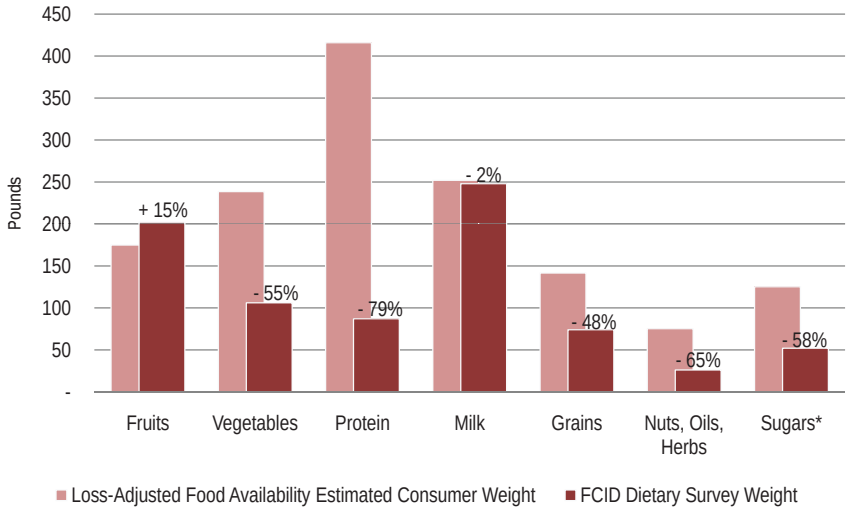
1 We used FCID data for city-dwellers in the Western U.S.

2 "Consumer weight" derived from USDA/Economic Research Service Loss Adjusted Food Availability data; last updated Feb 15, 2007. http://www.ers.usda.gov/Data/foodconsumption/FoodGuideIndex.htm. For more information on these data and our methodology, see Appendix 2.

3 Derived from Western Region, Central City data from USDA/Agriculture Research Service Food Commodity Intake Database, March 2004. For more information on these data and our methodology, see Appendix 2.

4 M. Pollan, *In Defense of Food: An Eater's Manifesto*. 2008. New York: Penguin Press. Pollan also explains that the food surveys themselves are difficult to fill out, requiring a very good memory and access to some information that is not easily available, for example, exactly how your restaurant meal was prepared.

Figure 4.1: Consumption by Food Group; Percent Change between Loss-Adjusted Food Availability Estimate and FCID Estimate



Source: Derived from Loss-Adjusted Food Availability, USDA/Economic Research Service; Revised Food Commodity Intake Database, USDA/Agriculture Research Service.

capacity of the San Francisco foodshed study area to meet the needs of consumers in the City and Bay Area.[5] San Francisco has an estimated population of 744,041[6], which swells to roughly 1.1 million during daytime hours with the influx of commuters and visitors.[7] It thus takes 1,012,839 tons of food produced at the farm gate to feed San Francisco each year. Using the same per capita consumption figure and a population of 6.9 million,[8] we arrive at a maximum consumption estimate of 6.4 million tons for the nine-county Bay Area.

The most-consumed commodities are eggs, milk, sugars, potatoes, wheat, poultry, tomatoes, beef, pork, corn, lettuce, citrus, apples, onions, rice, and turkey. Table 4.2 illustrates the differences between the food supply data's *primary weight* and *consumer weight*, and the dietary survey weight for these commodities. As in the food group data above, consumers say they are eating much less of some commodities and much more of others than the food supply data would suggest. (This will be important when we discuss diet and health later on.) Table 4.2 also includes a column showing the largest per capita consumption estimate for each commodity to help us generate a conservative comparison of consumption and study area agricultural production.

The City's Dietary Needs Could Easily Be Met by Agriculture in the San Francisco Foodshed Study Area, But Meeting Those of the Entire Bay Area Would Be More Challenging

We compared the maximum consumption estimate for each food group and each commodity[9] to crop production data from the county agriculture commissioners' reports for the counties in the San Francisco foodshed study area[10]. The crop reports do not include data for sugars, so they are excluded from these comparisons. Without sugars, San Francisco's demand at the farm gate amounts to about 935,000 tons of food annually, and Bay Area demand totals 5.9 million tons.

5 For food group data, the largest estimate was always in the "primary weight" category, with a total of 1,842 pounds required per capita.

6 U.S. Census, American Community Survey, 2006.

7 After accounting for commuters in and out of the city, the San Francisco Municipal Transportation Agency estimates daytime population at 945,480 (Derived from San Francisco Municipal Transportation Agency. San Francisco Transportation Fact Sheet, May 2008 and personal communication with Charles Purvis of the SFMTC.) In addition, the San Francisco Convention & Visitors Bureau estimates that there are roughly 129,000 daily visitors to the city, bringing the total daytime population to about 1.1 million. (Personal communication with Dan Goldes, San Francisco Convention and Visitors Bureau).

8 Total population of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties derived from U.S. Census Bureau, 2006 American Community Survey.

9 To be sure we have not underestimated consumption we will compare this largest figure to production data for each food group and for each of the top commodities (for all commodities see Appendix 2, Table A2.2). For a discussion of differences in maximum consumption figures when measuring by food group or by individual commodities, see Appendix 2.

10 To facilitate comparison of consumption and production numbers, we reclassified each commodity listed in our consumption data to conform to the categories used in the county agriculture commissioners' reports.

San Francisco's total food demand accounts for only five percent of agricultural production in the 25 county foodshed study area, while the Bay Area's demand accounts for 30 percent (Table 4.3).

Among the top commodities, production within the study area easily meets San Francisco's demand for milk, tomatoes, beef, lettuce, onions, rice, and turkey (Table 4.4). Only pork, citrus, and eggs are not produced in enough abundance within 100 miles of the City to satisfy its needs, and one does not have to go much farther afield – to Fresno County, in fact – to find more than enough citrus. Fulfilling the Bay Area's complete food needs would be more difficult; while agriculture in the study area now meets demand for tomatoes, lettuce, and rice, it does not meet the demand for pork, citrus, eggs, wheat, corn, and potatoes. For complete commodity-by-commodity details on production and consumption, see Table A2.2 in Appendix 2.

Healthy and Local?

American consumers eat fewer servings of dairy, fruits, and vegetables, and more servings of flour and cereal products, meat, eggs, nuts and "discretionary calories[11]" than recommended by the USDA. Fresh fruits and vegetables are the cornerstone of a healthy diet, but Figure 4.2 confirms findings from the 2001 California Dietary Practices Survey, which showed that adult Californians consume only 3.9 servings of fruits and vegetables each day (far below the five to nine recommended daily servings). Younger people are not doing

Table 4.2: Per Capita Consumption Estimates for Top 15 Most Consumed Commodities, in Pounds

	Loss-Adjusted Food Availability Data		FCID (Dietary Surveys)		Maximum
Commodity	Primary Weight Per Capita (lbs)	Consumer Weight Per Capita (lbs)	Dietary Survey Weight Per Capita (lbs)	Percent Change from Consumer Weight	Largest Per Capita Consumption Estimate (lbs)
Eggs	254	230	15	-93%	254
Milk, All	181	159	237	49%	237
Sugars*	141	125	52	-58%	141
Potatoes	127	68	26	-62%	127
Wheat	122	108	51	-52%	122
Poultry	100	56	18	-68%	100
Tomatoes, All	94	44	29	-35%	94
Beef (Cattle & Calves)	94	58	23	-61%	94
Pork (Hogs, Pigs)	64	43	9	-79%	64
Corn	58	43	17	-61%	58
Lettuce, All	32	27	8	-68%	32
Citrus	31	22	47	111%	47
Apples	23	18	46	150%	46
Onions	23	18	8	-54%	23
Rice	21	19	14	-25%	21
Turkeys	17	12	5	-61%	17

*Not recorded in Agriculture Commissioner production data, thus excluded from comparison

Source: Derived from Loss-Adjusted Food Availability, USDA/Economic Research Service; Revised Food Commodity Intake Database, USDA/Agriculture Research Service.

Table 4.3: San Francisco and Bay Area Maximum Food Group Consumption Estimates and San Francisco Foodshed Study Area Production Estimates, in Tons

	Production	San Francisco Consumption		Bay Area Consumption	
Food Group	2006 San Francisco Foodshed Study Area Commodity Production (tons)	Maximum SF Consumption Estimate (tons)	San Francisco Max Consumption as Percentage of Study Area Production	Maximum SF Consumption Estimate (tons)	Bay Area Max Consumption as Percentage of Study Area Production
Fruits	1,917,688	146,139	8%	919,796	48%
Vegetables	11,514,368	192,641	2%	1,212,483	11%
Protein	965,686	300,211	31%	1,889,527	196%
Milk	3,767,814	155,974	4%	981,700	26%
Grains	1,328,508	88,474	7%	556,859	42%
Nuts, Oils, Herbs	412,073	52,063	13%	327,686	80%
Sugars*	-	77,337	-	486,759	-
Total	*19,906,137*	*1,012,839*	-	*6,374,809*	-
Total (less sugars)	**19,906,137**	**935,502**	**5%**	**5,888,050**	**30%**

* Not recorded in Ag Commissioner production data, thus excluded from totals

Source: Loss-Adjusted Food Availability Data, USDA/Economic Research Service; Production data from County Agriculture Commissioner Reports

11 Fats, sugars, alcohol, or "more food from any food group than the food guide recommends". (USDA, "Inside the Pyramid", http://www.mypyramid.gov/pyramid/discretionary_calories.html).

MAP PAGE 1

MAP PAGE 2

Table 4.4: San Francisco and Bay Area Maximum Consumption Estimates and San Francisco Foodshed Study Area Production Estimates for Top 15 Most Consumed Commodities, in Tons

	Production	San Francisco Consumption		Bay Area Consumption	
Commodity	2006 San Francisco Foodshed Study Area Commodity Production (tons)	Maximum SF Consumption Estimate (tons)	SF Max Consumption as Percentage of Study Area Production	Maximum Bay Area Consumption Estimate (tons)	Bay Area Max Consumption as Percentage of Study Area Production
Eggs	60,033	139,668	233%	879,068	1464%
Milk, All	3,787,378	130,460	3%	821,118	22%
Sugars*	-	77,337	-	486,759	-
Potatoes	229,386	70,004	31%	440,606	192%
Wheat	178,833	67,254	38%	423,298	237%
Poultry	420,008	55,206	13%	347,467	83%
Tomatoes, All	4,859,673	51,747	1%	325,698	7%
Beef (Cattle & Calves)	792,082	51,581	7%	324,649	41%
Pork (Hogs, Pigs)	3,651	35,082	961%	220,808	6047%
Corn	97,204	31,693	33%	199,476	205%
Lettuce, All	2,849,251	17,812	1%	112,110	4%
Citrus	5,340	25,881	485%	162,895	3050%
Apples	167,125	25,072	15%	157,801	94%
Onions	170,391	12,474	7%	78,512	46%
Rice	1,050,994	11,574	1%	72,845	7%
Turkeys	104,451	9,148	9%	57,579	55%

*Not recorded in Agriculture Commissioner production data, thus excluded from comparison

The following are not included in the Top 15 because the Agriculture Commissioners do not publish data in these categories: Milk Products, Other; Herbs, Spices, Nuts, and Oils, Other; and Fruit, Other.

Source: Derived from Loss-Adjusted Food Availability, USDA/Economic Research Service; Revised Food Commodity Intake Database, USDA/Agriculture Research Service. Production data from County Agriculture Commissioner Reports.

any better: the 2003 California Health Interview Survey reported that only 19.2% of California adolescents consume three or more servings per day.[12]

One reason for these unhealthy dietary trends is that low-calorie, nutrient-dense foods like fruits and vegetables tend to be more expensive than high-calorie foods like peanut butter and soda. If a person has a limited food budget, they are likely to spend their money on high-calorie foods that will fill them up for the smallest possible price.[13] This is one reason that a large proportion of the population is at risk for diet-related diseases. Consumers are not following ideal diets, and the differences between the estimated food supply and the amounts and types of foods consumers report eating on dietary surveys – underestimating total consumption, over-reporting "good" foods, and underreporting "bad" foods – suggests that consumers are in a certain amount of denial about their eating habits.

The national obesity epidemic has received a lot of attention in recent years, and San Francisco is not immune. In 2003-2004, the national obesity rate for adults was 66 percent, while in 2005 the rate in San Francisco was about 43 percent.[14] Diabetes is also on the rise in San Francisco, as it is across the nation,[15] and the problem is worse in some neighborhoods than in others. In Bayview-Hunters Point, for example, the hospitalization rate due to diabetes is two to seven times higher than in other City

12 California Health Interview Survey (CHIS). Health of California's Adults, Adolescents and Children: Findings from CHIS 2003 and CHIS 2001. May 2006.

13 Kish, Stacy. "Healthy, Low Calorie Foods Cost More on Average." *USDA Cooperative State Research, Education and Extension Service Newsroom*. March 19, 2008. http://www.csrees.usda.gov/newsroom/impact/2008/nri/03191_food_prices.html

14 San Francisco DPH Community Health Promotion and Prevention. "Obesity Fact Sheet". www.shapeupsf.org.

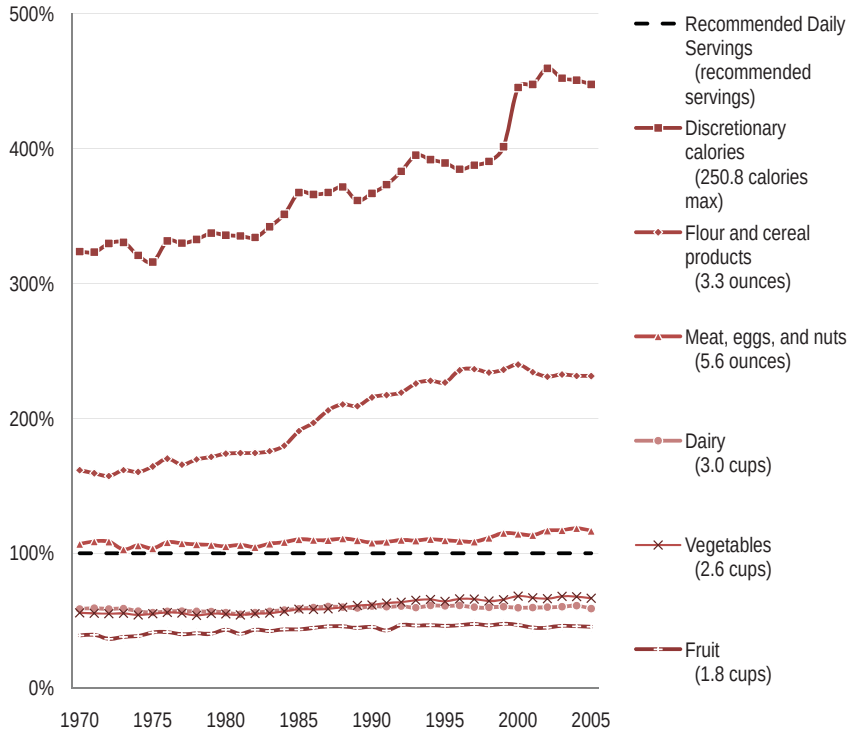
15 San Francisco DPH Community Health Promotion and Prevention. "Diabetes Fact Sheet". http://www.sfgov.org/site/uploadedfiles/shapeupsf/research_data/SFDPH%20DRAFT%20Diabetes%20Fact%20Sheet.pdf

neighborhoods.[16] While the San Francisco rates of obesity and diabetes are below the national average, a significant proportion of the population is still at risk for the diseases that accompany overweight and obesity.

In some San Francisco neighborhoods, it is difficult to obtain an affordable, healthy diet. This is due to a variety of factors including the cost of food and the lack of retail outlets that carry a full range of healthy foods. In such neighborhoods, consumers must spend a higher percentage of their income on food than other neighborhoods, as shown in Figure 4.3. This map helps illustrate why some neighborhoods in the city have better access to healthy food than others. Access to healthy food is also restricted in some neighborhoods by a lack of food retail locations; Figure 4.4 shows all food retail markets in the City, with a half-mile radius shown in black around all the stores over 10,000 square feet. This lack of food options is not due to lack of interest in healthy food; a 2007 study of consumers in one underserved neighborhood, Bayview-Hunters Point, found that "81 percent of respondents [rated] freshness as the most important factor when choosing a place to shop for food," and 53 percent said that "foods free of pesticides and chemicals grown by local farmers who treat farm workers fairly" is the most important quality of a food product.[17]

Even in better-off neighborhoods, however, consumers don't necessarily make healthy food choices, starting with how much of a priority they place on food in their budgets. According to the Consumer Expenditure Survey,

Figure 4.2: Percent of Recommended Daily Servings Actually Consumed, by Food Group

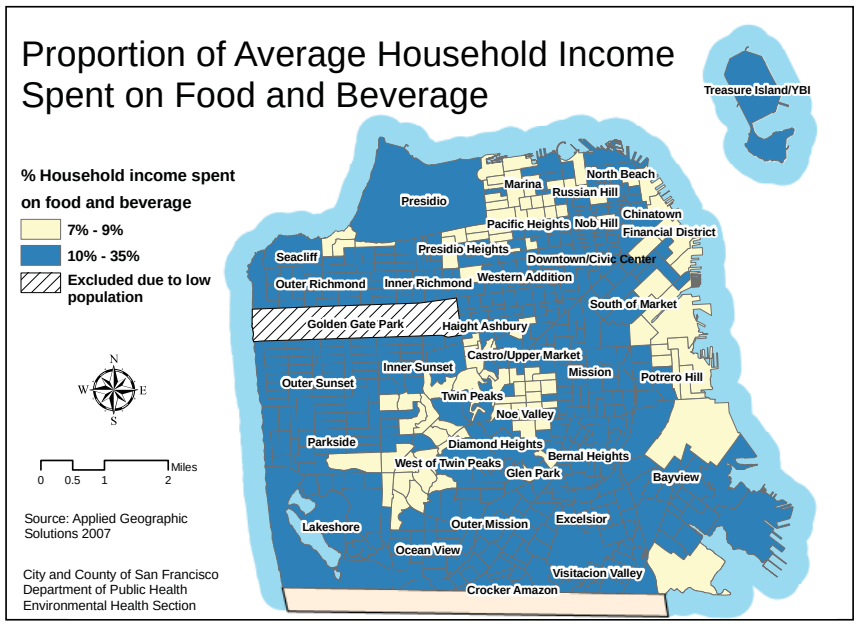


Source: Derived from Loss-Adjusted Food Availability Data from USDA/Economic Research Service and January 2005 Dietary Guidelines for Americans

16 San Francisco Department of Public Health. "Health Programs in Bayview-Hunters Point & Recommendations for Improving the Health of Bayview-Hunters Point Residents". 2006.

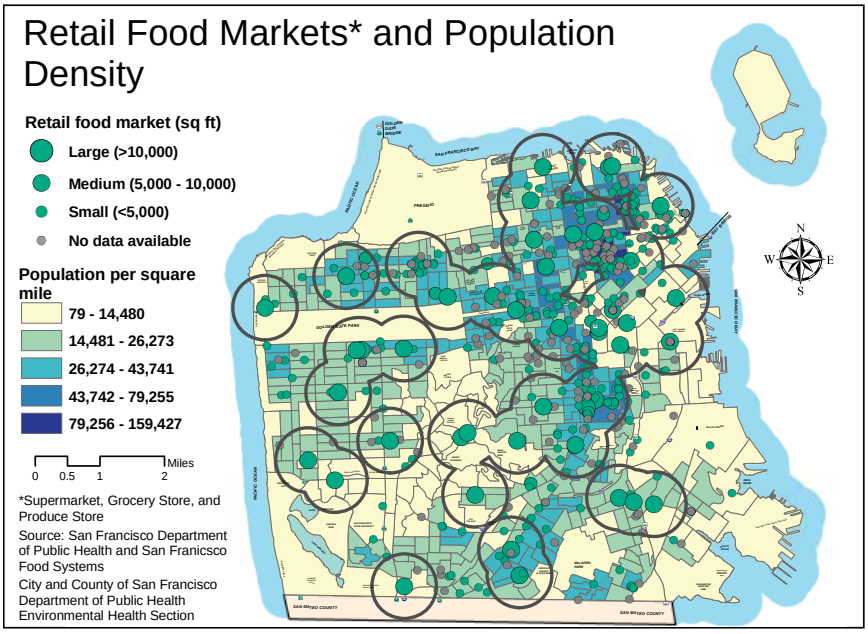
17 Food Preferences in San Francisco's Southeast Sector: A Survey Conducted by the Southeast Food Access Working Group. http://www.sfgov.org/site/uploadedfiles/shapeupsf/SEFASurveyReport-FINAL.pdf

Figure 4.3



Source: Jen McLaughlin, SF Dept of Public Health, Environmental Health Section

Figure 4.4



Note: Radii indicate 1/2 mile walking distance from Large Retail Food Markets

Source: Jen McLaughlin, SF Dept of Public Health, Environmental Health Section

the average resident of the Bay Area[18] spends a total of $26,538 each year. The top two categories are housing and transportation; food is the third largest category at 12 percent of total expenditures or nine percent of total income, nearly even with the fourth largest category, personal insurance and pensions.[19] But the proportion of household budgets spent on food has declined over the years, from 15 to 12 percent in the western United States between 1987 and 2006.[20]

Consumers have come to expect that their food budget will represent a small proportion of their total spending. San Franciscans spend 56 percent of their food budget on food consumed at home. Outside the home, they spend most of their remaining budget on full-service restaurants, fast food, delivery, take-out, concession stands, buffets, and non-school/non-employer cafeterias . When food intake is measured by weight rather than dollars, fast food and pizza restaurants claim the largest share of total food consumed – a whopping 35 percent[21] (Figure 4.5). Influencing consumer behavior at these restaurants could be an effective way to change diet patterns so they include healthier, locally-grown foods.

In stark contrast with the amount of food consumed at fast-food restaurants is the consumption of organic and locally-grown foods. According to the Organic Trade Association's 2007 Manufacturer Survey, organic products comprised an estimated 2.8 percent of U.S. retail food sales in

18 This figure is actually for the San Francisco Metropolitan Statistical Area, which includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma Counties.

19 Consumer Expenditure Survey, 2005-2006. Average annual expenditures and characteristics, San Francisco MSA.

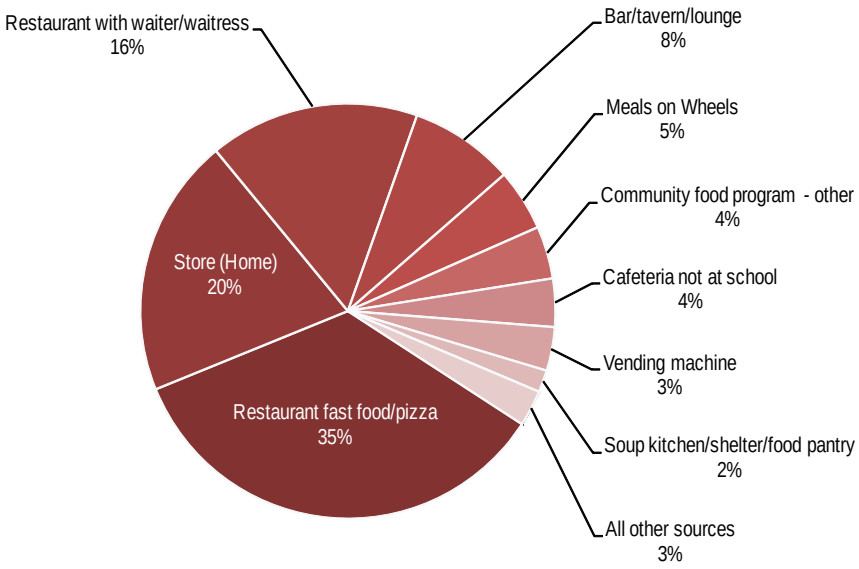
20 Consumer Expenditure Survey Unpublished Regional Data, 2005-2006

21 What We Eat in America, 2003-2004 data, http://www.ars.usda.gov/Services/docs.htm?docid=15044

2006, totaling $17 billion out of total retail food sales of $598 billion. This represented a dramatic increase of 21 percent over 2005 sales,[22] but is still a tiny fraction of total food sales. The organics industry will have to get much larger before it can reach the majority of consumers and begin to have an effect on the unhealthy diet trends documented above.

The *2007 Manufacturer Survey* also found that sales of locally-grown foods "are expected to jump from approximately $4 billion in 2002 to $5 billion in 2007," and are likely to become a $7 billion dollar industry by 2010.[23] Nonetheless, in 2002 local food sales represented only three-quarters of one percent of total food sales.[24] But on an optimistic note, most consumers are buying at least a few local products. According to the Hartman Group's 2008 report, *Consumer Understanding of Buying Local*, "over three-quarters of U.S. consumers say they are buying products they perceive to be locally made or produced."[25]

Figure 4.5: Weight of Food Consumed by Food Source



Source: What We Eat in America, 2003-2004 data

22 Organic Trade Association's 2007 Manufacturer Survey. Packaged Facts, 2007. http://www.ota.com/pics/documents/2007ExecutiveSummary.pdf

23 Packaged Facts. Locally Grown Foods Niche Cooks Up at $5 Billion as America Chows Down on Fresh! Jun 20, 2007 press release. http://www.packagedfacts.com/about/release.asp?id=918

24 Total food sales in 2002 were $531 billion (Organic Trade Association *2007 Manufacturer Survey*. Packaged Facts, 2007. http://www.ota.com/pics/documents/2007ExecutiveSummary.pdf)

25 The Hartman Group. *Consumer Understanding of Buying Local*. 2008.

San Francisco Food Distribution System

Evolving toward Local Food with a Provenance

The food distribution system is a critical link the San Francisco foodshed. It is the conduit through which food products move from farms and ranches to consumers. But it moves, or is capable of moving, more than the products themselves. As consumers demand more information about the provenance of food, the system is beginning to respond by providing the story behind it.

The mainstream food system in the United States provides food that is plentiful, cheap, safe and impressively varied to a majority of the population. It relies on economies of scale and regulations, grading and generic descriptions to produce, pack or process, track and sell a large volume of standardized products. But the same characteristics that promote efficiency also homogenize products and tend to inhibit the flow of information about how, where and by whom the food was grown or raised.

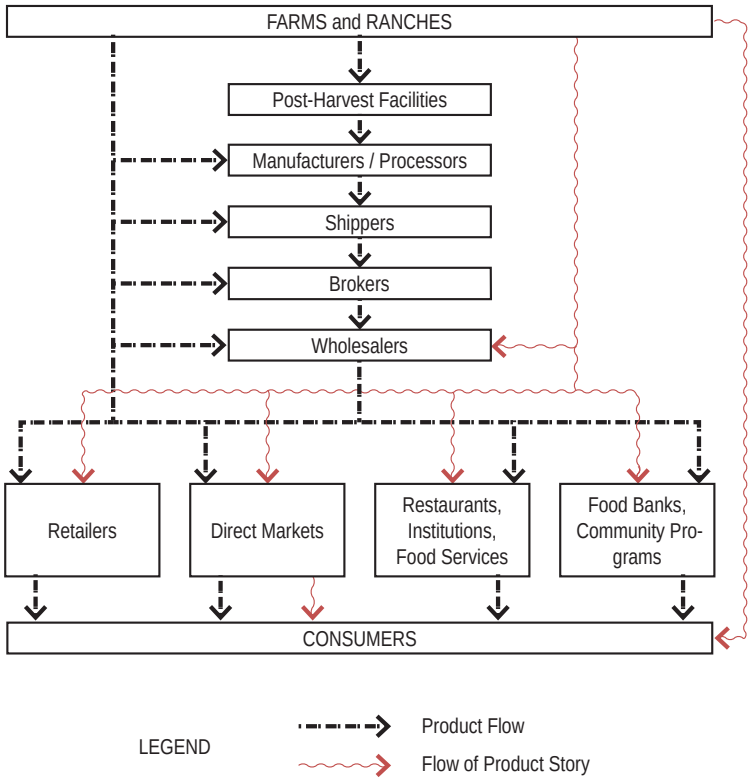
An Extensive, Elaborate System for Efficient Goods Movement

The food distribution system that serves San Francisco and the Bay Area is large and elaborate, reflecting the wide array of foods obtained from thousands of producers over a dispersed geographic area, as well as the region's almost-as-numerous market outlets. It encompasses different business sectors that provide a range of specialized services, among the most important of which are transportation, post-harvest handling, processing, storage, and wholesale and retail sales (Figure 5.1).

There are many distribution channels from farm to fork. Each path combines the movement of food with a flow of information about the food. Only a few paths transport food directly, often straight from farmer to consumer, and these are the ones that also transmit the most information about the product. Much more common are the distribution channels that move large volumes of generic food, the provenance of which is almost impossible for the average consumer to trace. Figure 5.1 shows the main sectors that comprise the food distribution system and the relationships among them. It also is intended to demonstrate how the flow of information about food isn't as prevalent or robust as the movement of the goods themselves.

Within the City of San Francisco itself are more than 450 food wholesalers, including 43 that specialize in fresh fruit and vegetables. These produce wholesalers are located primarily in and around two major facilities, the San Francisco Wholesale Market and the South San Francisco Produce Terminal, which handle most of the fresh produce

Figure 5.1: Food Distribution System Sectors



in the entire Bay Area.[1] Among the enterprises that distribute to wholesales are 137 food manufacturers in the City and another 1,543 within the entire San Francisco foodshed study area that convert raw commodities into everything from baked goods and ice cream to sausages to salsa.[2] Retail food stores in San Francisco number 1,488, representing a very diverse mix that includes large supermarket chains, neighborhood groceries, cooperatives and ethnic specialty stores like those in Chinatown and the Mission District.[3] They obviously could play a huge role in promoting local food by providing point-of-purchase information about it. But some areas of the city like Bayview-Hunters Point are not well-served by retail food outlets, a major obstacle to the distribution of local food to low and moderate income residents.

Other direct links to consumers are restaurants, institutions like schools and hospitals, and food banks. There were 2,980 restaurants of various types in San Francisco in 2002, though the number is probably higher today.[4] Full-service restaurants tend to cater to a clientele that is more attuned to the local food movement and, thus, are among the leaders in providing it. Those that change their menus on a daily basis find it easier to source local food in-season than those that must be able to count on having the same ingredients for a set menu.

Public institutions are also a significant supplier of food directly to consumers. Just the public hospitals in San Francisco serve about 3 million meals a year, the correctional institutions 2.4 million and the San Francisco Unified School District around 6 million.[5] San Francisco also operates a food bank serving needy and hungry people in the city, collecting donated food from each stage in the distribution chain. It administers various programs that serve an estimated 18 million meals a year.[6]

The Emerging Local Food Sector

Though it remains only a small part of the overall food distribution system, the sector that includes in its operations a focus on supplying fresh, local food to San Franciscans is robust and growing. At the wholesale level are firms like Greenleaf Produce Company, which distributes specialty produce and has grown 15-fold over its 25 year history. Veritable Vegetable began as an informal collective and is now one of the nation's oldest and largest distributors of certified organic produce. The San Francisco Wholesale Market is now conducting a survey of the customers of its wholesalers to determine the extent to which they are increasing their purchases of locally produced foods and if so, the reasons for this increase.[7] In the food service sector, firms like Bon Appetit Management Company, based on the Peninsula but part of a global conglomerate, specialize in providing corporate customers and colleges with locally-grown, seasonal products.

Retailers such as Andronico's and Safeway promote special local products identified by the name of the farm or specific location, for example, "Brentwood Sweet Corn." Other independent stores, notably Rainbow Grocery, and chains that aim to be both global and local, for example, Whole Foods, make a major point of promoting as many locally-grown products as possible. All struggle with the challenge of providing a steady year-round supply of thousands of standard food items, while simultaneously trying to accommodate the growing demand for highly-differentiated local foods that are available only in limited supply for brief periods of time.

Public and private institutions have been among the leaders in promoting local food in San Francisco. For example, Kaiser Permanente, the health care provider, is becoming well-known for operating farmers' markets at its local hospitals and by sponsoring a CSA (community supported agriculture) for its employees. In the public sector, the City of San Francisco formed a Healthy and Sustainable Food Working Group[8] in 2006 to guide the

1 The *2005 San Francisco Collaborative Food System Assessment*, published by the San Francisco Food Alliance, includes additional information on wholesalers as well as maps of their locations.

2 Data are available from the U.S. Economic Census for only 16 of the 25 counties within the San Francisco foodshed study area because for privacy reasons it does not publish information when there are so few companies in a county that figures could easily be traced to individual businesses.

3 *San Francisco Collaborative Food System Assessment, 2005,* Dun and Bradstreet data.

4 U.S. Economic Census, Geographic Area Series, 2002

5 Personal communication, Paula Jones, San Francisco Department of Public Health

6 *2005 San Francisco Collaborative Food System Assessment*, p. 53

7 Personal communication, Mike Janis, San Francisco Wholesale Market

8 An interagency task force comprised of staff from the San Francisco Department of Health, San Francisco Food Systems, and the San Francisco Department of the Environment. The San Francisco Healthy and Sustainable Food Working Group, which now includes many city and county agencies and food system

implementation of food policies like the Department of Public Health's (DPH) *Healthy and Sustainable Food Policy for Food Served at [Department] Events, Programs, and Institutions.*[9] This policy calls for acquiring food from "healthy, environmentally sound, and sustainable sources" and applies to DPH institutions such as San Francisco General and Laguna Honda Hospital.[10]

Restaurants, perhaps most of all, have been pioneers in local food in the Bay Area. San Francisco has been renowned as a "food city" since Gold Rush days, with abundant, varied, locally-grown foods – asparagus, artichokes, cherries, cheeses, crab, oysters, lamb, olive oil and wine, to name just a few – being an integral part of the city's special appeal. Starting in the early 1980's, ingredient-focused restaurants like Chez Panisse and Greens played a key role in re-establishing the value of seasonal and local foods. Their menus became known as "California Cuisine," associated with health as well as quality. By insisting on buying locally, composing menus that gave them the flexibility to use the best local, seasonal foods available, and by actively promoting their suppliers, these restaurants have had an influence on the local food movement far beyond their market share.

Farmers' markets are the very face of local food. Currently, there are 12 farmers' market locations in San Francisco, including the oldest one in the state, the Alemany Farmers' Market founded in 1943. All operate one day per week, some seasonally, except for the Heart of the City Market and Ferry Plaza, which operate twice per week.[11] San Francisco farmers' markets are managed by a wide range of entities, including private, nonprofit and government agencies, and are subject to both local and state regulations.[12]

Customers of the city's farmers' markets vary widely. According to a 2007 survey, at the Alemany and Heart of the City markets, more than 80 percent of the customers were San Francisco residents who spent an average of $44 and $28, respectively, at these two markets. At the Ferry Plaza market, only 59 percent of the customers lived in the City, but spent an average of $53 apiece.[13] There appear to be no data on total sales at farmers' markets because they are exempt from standard packing and labeling requirements that would enable this to be tracked.

Finally, the local food sector in San Francisco includes Community Supported Agriculture (CSA) programs, operated by individual farms or several together, which charge subscribers a fixed price for a weekly box of seasonal vegetables, fruit, meat and sometimes even fresh flowers. Ten CSAs, located in Mendocino, San Benito, San Francisco, Santa Cruz, Solano, and Yolo Counties, distribute to homes or neighborhood pick-up locations in the City. Frog Hollow Farms, for example, charges $35 per week for ten pounds of organic fruit. The 454 San Francisco customers of Eatwell Farms CSA pay $24.50 each for a box that averages 11 pounds per week. Morris Grass Fed Beef provides 35 to 45 San Francisco customers with an annual total of 3,200 pounds of beef, valued at about $20,000.[14]

The Flow of Information Challenge: Identifying the Provenance of Local Food

While the food system in San Francisco is very good at managing the flow of standardized goods, it encounters challenges in conveying the story behind the food – its provenance. Across the country and world, for that matter,

nonprofits, educates city staff and the public about sustainable food procurement, collaborates among city agencies and schools to source more sustainable food, and develops and implements sustainable food policies. (San Francisco Healthy and Sustainable Food Working Group website, http://www.sfgov.org/site/sffood_index.asp?id=66021

9 This policy builds on previous City and County of San Francisco resolutions that support the purchase of organic certified foods and fair trade certified products, as well as a sweat-free contracting ordinance that includes food. See, San Francisco Food Working Group (SFFWG) website, http://www.sfgov.org/site/sffood_index.asp?id=66021

10 San Francisco Department of Public Health, adopted July 18, 2006, www.sfgov.org/site/uploadedfiles/sfenvironment/meetings/pc/supporting/2006/DPHSustainableFoodPolicy.doc; and see, San Francisco Healthy and Sustainable Food Working Group, Policy and Reports website, http://www.sfgov.org/site/sffood_index.asp?id=66025

11 The *2005 San Francisco Collaborative Food System Assessment* includes a map of markets, and a map showing the locations of farms serving these markets. The San Francisco Chronicle website maintains a list of farmers' markets in the city.

12 The *Farmers' Market Resource Kit* (SAGE, 2005) includes information about market regulations as well as a summary about the farmers' market movement. http://www.sagecenter.org/Projectareas/Markets/Mkt%20City.htm; see also, California Department of Food and Agriculture, Certified Farmers' Market Program, http://www.cdfa.ca.gov/is/i_&_c/cfm.html

13 L. Griffith, *The Meanings of Farmers Markets,* master's thesis, 2007, University of California, Berkeley.

14 See Appendix C for a more comprehensive list of local CSAs.

consumers are demanding to know more about their food. Driving this phenomenon are a number of factors, including dietary restrictions, nutritional needs, food safety issues, religious customs, ethical considerations and, increasingly, a desire for food that is "good, clean and fair."[15]

With considerable prompting, the food industry has begun to meet this demand. We now have nutritional labeling and USDA organic labeling to name just two major accomplishments of the U.S. food and agriculture industry. Recent years have also brought a proliferation of private "green" labels, often backed by certification systems, which offer assurances about the environmental and socio-economic values embraced by food producers and distributors. Among the most-respected are TransFair USA, based in Oakland, and Food Alliance, based in Oregon with an office in Davis, California.[16] The California Department of Food & Agriculture is a partner in the Buy California Marketing Agreement, which features a "California Grown" label along with an advertising campaign.[17] While not strictly local, it does narrow down the provenance of certified foods to the Golden State.

Farmers' markets and CSAs actually rely on local provenance of the food they offer as a distinct selling point. Not only must they be able to trace the origin of food, they also have the easiest time doing so because there are few, if any, intermediate handlers involved. Whether this kind of direct marketing is feasible on a much larger scale remains to be seen. (Though wouldn't it be great?!) For once the chain of custody lengthens, the problems of traceability are compounded. On a somewhat larger scale, one of the most successful efforts to disseminate provenance information and generate interest in local food has been the "Buy Fresh Buy Local" campaign run by the Community Alliance with Family Farmers, which has several chapters in the Bay Area.[18]

The experience of local wholesalers like Veritable Vegetable illustrates the challenge that the industry faces in being able to trace the provenance of food on a large scale. For one thing, information tracking is not always straightforward. Many larger growers have a single business address, but may grow and consolidate their products from a number of farming areas located in several states and even countries. Some medium-sized growers sell their products under several different labels. There are also umbrella labels under which multiple growers pack. Adding provenance information to the flow of products also carries with it a cost that must be weighed against the potential economic benefit. And complicating it all is the wholesalers' need to consider the balance between demand for public disclosure and need for proprietary relationships with growers.[19]

The Connectors: Building Momentum for Eating Local

To take full advantage of the available Information about the provenance of food – and to compensate when it is unavailable -- consumers need to be better educated about food in general, about their foodshed and about agriculture itself. We shouldn't need a label to know that a peach purchased in January was not locally-grown, even here in northern California.

There are many organizations that promote local food by educating consumers and helping them locate it, by creating marketing opportunities and otherwise helping local growers produce what consumers want, and by performing myriad other functions that connect people to good, clean, fair food. The San Francisco foodshed study area has perhaps a greater concentration of them than any other region in the United States. Table 5.1 explains the purpose or focus of each organization we identified. The Bay Area Local Food Guide, published by the Community Alliance with Family Farmers, provides more detailed information on many of these organizations.[20] As much as any other part of the food system, these organizations are responsible for the momentum that eating local has gained.

15 This is the motto of the global organization, Slow Food. http://www.slowfood.com/

16 See, TransFair USA, http://www.transfairuse.org; Food Alliance, http://www.foodalliance.org/

17 Buy California Campaign, http://www.californiagrown.org/

18 Buy Fresh, Buy Local, http://guide.buylocalca.org/

19 Personal communication, Bu Nygrens, co-owner, Veritable Vegetable

20 Bay Area Food Guide, http://guide.buylocalca.org/PDFs/BFBL_bayarea_guide-2.pdf

Table 5.1: Connector Organizations

	Advocacy	Business Development	Disadvantaged Communities	Education	Farmers & farmland preservation	Funding	Local/Seasonal Foods	Marketing	Organics	Policy Development	Public Health	Research	Publication or website only
American Farmland Trust	x			x	x					x		x	
Brentwood Agricultural Land Trust					x		x	x					
Business Alliance for Local Living Economies		x											
California Association of Food Banks	x		x										
California Farmers' Market Association					x		x	x					
California FarmLink		x			x								
Center for Food Safety										x	x		
Center for Ecoliteracy				x									
Center for Urban Education about Sustainable Agriculture				x			x	x					
Common Ground					x		x						
Community Alliance with Family Farmers	x			x	x					x			
Eat Well Guide				x			x						
Edible San Francisco (also East Bay)				x			x						x
Food Routes Network				x			x						x
Food First/Institute for Food and Development Policy	x			x						x		x	
Greenbelt Alliance	x			x						x		x	
Growers Collaborative							x	x					
Health Care Without Harm	x			x									
La Cocina Community Kitchen		x											
The Local Foods Wheel, San Francisco Bay Area				x			x						x
LocalHarvest							x	x					x
Locavores							x						x
Marin Agricultural Land Trust				x	x	x							
Marin Food Systems Project					x		x						
Marin Organic				x			x	x	x				
Natural Resources Defense Council	x									x		x	
Nextcourse			x				x						
Occidental Arts and Ecology Center				x	x		x						
Om Organics								x	x				
Pacific Coast Farmers' Market Association								x					
Physicians for Social Responsibility - San Franc.Bay Area	x			x							x		
Roots of Change Fund	x			x		x						x	
San Francisco Food Systems	x			x							x	x	
San Francisco Department of Public Health													
Program on Health, Equity and Sustainability	x			x						x	x	x	
SF Healthy & Sustainable Food Working Group	x		x	x							x	x	
SE Sector Food Access Working Group - Shape Up SF	x										x	x	
Slow Food San Francisco (and Slow Food USA)	x			x			x	x					
Society for Agricultural Food Ecology					x		x					x	
Sonoma Cty. Agricultural Preservation & Open Space Dist.					x					x			
Sustainable Agriculture Education (SAGE)				x	x							x	
100 Mile Diet				x			x						x
UC Small Farm Program & County Cooperative Extensions				x	x			x				x	

Source: Bay Area Local Food Guide (published by CAFF), organization websites, and personal communication with individual orgnaizations

Observations and Recommendations

"We have spent 100 years dismantling America's local food systems. It's time to grow them back."

-- PAUL MULLER, FULL BELLY FARM GUINDA, CALIFORNIA

In the course of our study, we interviewed dozens of experts in food, agriculture, environment, business and economics to enliven the statistics we gathered with their observations about the San Francisco foodshed and the prospects of taking "eating locally" to scale in this region. We give them credit in the acknowledgements section of this report. Since much of what we heard is opinion, we consider the entirety of this section an extended hypothesis about the shortcomings of the modern food system, how local food could begin to correct it, and how that could be accomplished.

Provenance and Traceability

What are the most important things we have learned from our study of the San Francisco foodshed? Perhaps the most central lesson is that, if we want to eat locally, we must be able to trace food back to a local source. Years ago, that was fairly easy, for the food system – actually systems -- in America were almost entirely local or, at most, regional. But today, after decades of expansion, modernization, consolidation and standardization, primarily serving the interests of convenience and economy, the American food system generally does not enable one to track the provenance – the what, where, who and how -- of the food on supermarket shelves, in restaurants and school cafeterias.

Chicken-and-Egg: Challenges to the Expansion of Local Food Systems

Thus, the first challenge to expanding local food systems in northern California or elsewhere is to re-establish the connection between farm and fork, between producer and consumer, between the food and its story. But to do this, another obstacle must be overcome; what we call the chicken-and-egg challenge. Today, consumers have become so accustomed to "incognito" food that most do not know about the alternative of local food with a provenance, much less demand it when they shop or dine out. So, most mainstream food retailers have little or no incentive to identify locally-grown food, which perpetuates consumers' lack of awareness and interest, and so forth. Somehow, this vicious circle must be broken.

Farmers markets, CSAs and other self-consciously local food outlets constitute the fastest-growing segment of the U.S. food system. But, as the statistics show, they remain a tiny fraction of overall food production and, perhaps through no fault of their own, seem to appeal mainly to consumers with more disposable income. Some supermarket chains such as Safeway and particularly Whole Foods are beginning to market locally-grown produce as such, and in terms of taking local food to scale, may offer more promise than farmers markets and CSAs. But supermarkets are held back by their reliance on economies of scale and standardization that tend to become less economic as their transaction costs rise, for example, if they have to deal with too many smaller producers of too many different food varieties.

In short, "food with a story," despite its benefits – and perhaps *because* of its benefits -- seems to come at a price that most consumers today are not ready to pay,

or so the major retailers seem to believe.[1] It is almost certainly true for lower-income consumers in San Francisco, many of whom do not have ready access to farmers markets or even neighborhood supermarkets. They often must rely on convenience stores and fast-food outlets that, it goes without saying, do not market locally-grown food. Ultimately, it is only when demand for local food gets to an appropriate scale that it will compete with "incognito" food. The question remains, how to get there.

Cost and Risks to Would-Be Local Producers and Distributors

There is another series of challenges on the production and distribution side, particularly when it comes to organic or "sustainably" grown food. Agricultural producers themselves have become dependent on economies of scale and standardization. To satisfy the demands of their wholesale, retail and institutional customers, farms have become larger and less diversified – not to mention fewer in number -- and the crops they grow are bred more for industrial processing and long-distance transportability than for freshness, taste and nutritional content. The methods used to grow them rely heavily on mechanization, fossil fuels and chemicals.

This description is not intended as a critique of modern farming – that can easily be found elsewhere – but simply to help define the challenge facing agricultural producers who may want to switch to growing for local markets. Conventional agriculture is presently not set up to produce the kind of food that locavores demand. Growing sustainable local food requires an entirely different set of horticultural and marketing skills, labor relations and, in many cases, specialized farm equipment. To get the goods to market, without mixing them with conventionally-produced products, new storage, processing and transportation infrastructure are needed. And in order for locally-sourced food to compete economically with the conventional food system, the distribution networks that deliver it will need to be efficient in terms of time, money and fossil fuel use, and it will be necessary to educate consumers on the benefits of local products to help create demand.

Acquiring or developing all this will require quite an investment of intellectual and financial capital. It also entails considerable economic risk because local food and markets are still emerging. This suggests another big challenge to taking local food to scale. In a forthcoming study of the credit needs of local producers, Gary Matteson and Rob Heuer, both associated with the Farm Credit System, note that, "Local food system initiatives cannot ramp up supply without financing. However, small-scale innovators [in both production and distribution] dealing with seasonable and perishable farm products are likely to have difficulties obtaining credit."[2] Plus, there is the risk that "if transaction costs rise at the same rate as total revenues, the gain to the farmer of selling to local markets would be lost."[3]

Another challenge on the production side is that certain crops popular among San Francisco consumers cannot easily be produced within 100 miles of the Golden Gate. These include wheat for bread and pasta, citrus fruits and avocados. A much longer list of crops can be produced within the study area only during certain seasons. This has a couple implications. The first is that local growers must necessarily share the market with those outside the region. Second, as a consequence, the price they receive for their product is influenced, even in season, by what is charged by other growers, including those from Latin America and Asia who have made significant inroads in North American markets.

Opportunities to Expand Local Food in San Francisco and Beyond

Though the challenges of taking local food to scale are formidable – and more complicated than implied above -- there is significant reason to believe they can be

1 It isn't clear whether locally-grown food *per se* is more costly or the premium associated with it, if any, is attributable to the fact that much of it is organically or sustainably produced. It is reported that organic food is 10 to 40 percent more expensive than conventionally-produced food. C. Winters and S. Davis, *Organic Foods*, Journal of Science 71(9), 2006; but see, T. Duggan, How shoppers can save when buying organic, SF Gate (May 3, 2006) http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2006/05/03/FDGE0IGLAA1.DTL&hw=farren&sn=001&sc=1000

2 G. Matteson and R. Heuer, Farm Credit Council, *Growing Opportunity: The Outlook for Local Food Systems* (to be published in 2008)

3 *Id*., quoting L. Kirby, C. Jackson and A. Perrett, *Growing and Expanding the Western North Carolina Food and Farm Economy* (2007).

overcome and that San Francisco and other Bay Area communities will someday have greater access to healthy, fresh locally-grown food.

For one thing, local food seems to have tremendous momentum. As described in the section on distributors and "connectors," the local food movement in the Bay Area is vigorous and innovative. Consumer awareness is growing. Education initiatives like the Roots of Change Fund's Vivid Picture Project are highlighting the social, economic and environmental benefits of eating locally and sustainably. Major retailers like Safeway and Whole Foods are stepping up to the plate to offer locally-grown food options to consumers. The San Francisco Department of Public Health, other City agencies and the school district are making a deliberate effort to find healthy, local sources of food for public institutions. Private business is also seizing the opportunity. Local firms like Bon Appetit Management Company and Veritable Vegetable are specializing in sustainably-grown produce in the restaurant supply and catering sectors. Kaiser Permanente, the health care provider, is "walking the talk" by reworking its cafeteria menus to include fresh, local products, hosting farmers markets at its facilities, and sponsoring CSAs for its employees. The Marin Agricultural Institute's "Farm to Fork" enterprise is establishing new transportation infrastructure specifically for sustainably-produced local food. Mainstream agricultural institutions such as the local Farm Credit banks are exploring the market potential of locally-grown food. In short, local food has tremendous momentum in and around San Francisco.

Another factor that could powerfully influence the growth of local food in the region and elsewhere is the rising cost of fossil fuel. It now takes between 7 and 10 calories of fossil fuel energy to deliver each calorie of food energy to the consumer's plate.[4] Because conventional agriculture is so dependent on fossil fuels, everything from producing and processing food to transporting it long distances – 1,300 miles on average between farm and the consumer[5] -- will be affected. In theory, this could favor local sources of food produced with fewer fossil fuel inputs and shipped fresh in season. In effect, it might hasten a reversal of the historic evolution of modern agriculture, which is one of substituting energy and technology for human labor and land. That doesn't necessarily mean a return to Jeffersonian agrarianism so much as a blending of the best of the old and new in locally- or regionally-based food systems that take full advantage of information and energy-efficient technologies, while emphasizing the provenance of food.

Perhaps the most important opportunity to expand locally-grown food is the one that is most often taken for granted: the resource base responsible for the amazing cornucopia of northern California agriculture. As we said at the outset, few if any cities in the world are as blessed with such a coincidence of superior farmland and beneficent climate around them. Because of these natural assets, California growers have become the global leader in the variety and value of agricultural products they bring forth. And because of them, the San Francisco foodshed region could become the world leader in consuming and supporting locally-grown food – if the land from whence it comes is careful nurtured and is not squandered on urban sprawl.

Recommendations

In this brief report, we have been able to analyze the San Francisco foodshed, its challenges and opportunities in only the most general way. Our recommendations are similarly broad but, hopefully, are a good blueprint for more particular action and further investigation.

- The food system should be made more transparent so that food can be traced from farm to fork and its provenance, in the broadest sense, can become more of a selling point. To break the chicken-and-egg cycle, consumers can demand more information about their food in supermarkets and restaurants – including fast-food outlets. Distributors can harness information technologies to provide details, not just about origin and nutrition, but a more complete and compelling story behind the food.

- Universities and agricultural extension institutions that educate growers about the latest cultural and marketing techniques, need to devote more

4 M. Pollan, *Omnivore's Dilemma*, The Penguin Press: New York, p. 182

5 H. Hill, *Food Miles: Background and Marketing*, National Sustainable Agriculture Information Service, 2008, www.farmland.org/documents/37012/foodmiles.pdf

resources to research and education that will promote fresher, tastier, healthier locally-grown food that conserves energy and other resources.

- Infrastructure for storing and transporting local food in-season, and for processing and preserving local food for out-of-season consumption, should be expanded. Locally-produced convenience products, which represent a significant portion of many diets, should be created and marketed.[6]

- Financial institutions need to find ways to provide the capital and management expertise growers, processors and shippers will need if they want to transition from globally- to locally-marketed agricultural products.

- Consumer education about local food benefits and availability should be expanded. An especially intriguing idea is incorporating the provenance and seasonality of food into dietary guidelines modeled on the USDA Food Pyramid, as has been done in the Northeast Regional Food Guide.[7] Injecting regional food information into a food guide will help consumers follow "sustainable diets[8]" that include seasonal variation and are rich in a particular region's foods.

- Private sector companies should consider buying and facilitating transportation of locally-grown food for their corporate cafeterias and by sponsoring CSAs for their employees. They should attempt to take advantage of economies of scale by partnering with other firms in their area.

- Public institutions like schools, hospitals, prisons and government agencies should explore similar arrangements. The City should redouble its efforts to work with suppliers to provide healthy, locally-grown food to the neediest San Franciscans. It should encourage food retailers to move into parts of the city that are currently underserved, offering tax and other incentives if necessary.

- Incentives for farmland conservation and stewardship should be increased to safeguard the resource base, taking full advantage of expanded funding in the 2008 Farm Bill. Local governments should adopt accountability measure to increase development efficiency and minimize the loss of high quality farmland.

- Consideration should be given to the formation of a blue ribbon committee, broadly representative of agricultural and urban interests with a stake in local food, to conduct a more detailed examination of the challenges and opportunities in the San Francisco foodshed study area (and perhaps beyond) with a view to devising a plan for expanding both the production and consumption of local food in the region.

This report has barely scratched the surface of the local food phenomenon in San Francisco and the foodshed that surrounds it. There is much more to learn and do before the full potential of the cornucopia that is northern California agriculture can be harnessed, the food distribution system can adapt and consumer preferences can evolve to the extent necessary to take "eating locally" to scale. What is needed is nothing less than a paradigm shift toward a more sustainable society in which food, like energy, water and other natural resources, is valued in a different way than it is today. In a way that recognizes the full cost of the choices we make to our health, our children and the planet we will pass along to them. On one hand, the local food phenomenon seems to be a manifestation of the quest for greater security in an increasingly uncertain and troubling world; an attempt to take personal responsibility for the future. On the other, it is in the here-and-now a delicious and delightful celebration of the best that the Earth and those who make it fruitful have to offer. Either way you look at it, eating locally is a very appealing choice for more and more people. And that offers great hope that, sooner rather than later, the local food systems in this region -- and throughout the country -- can, as Paul Muller put it, be "grown back."

6 J. Wilkins, *Eating Right Here: The Role of Dietary Guidance in Remaking Community-Based Food Systems*. Chapter in C. Hinrichs and T. Lyson (eds.) *Remaking the North American Food System*. 2007,University of Nebraska Press, p.179.

7 See, Cornell University Cooperative Extension, http://www.nutrition.cornell.edu/foodguide/archive/index.html

8 J. Wilkins, *supra*, p. 167

Appendix 1

Table A1.1: 2006 Commodity Production in the San Francisco Foodshed Study Area
Page 1, Almonds - Pumpkins

Commodity	# Co	Top Producer	Acres	Tons	$ x 1000	$/Ac
Almonds	9	Stanislaus	292,047	302,326	$ 736,523	$ 2,522
Anise	1	Monterey	600	9,700	$ 5,257	$ 8,762
Apples	11	San Joaquin	12,635	167,125	$ 72,447	$ 5,734
Apricots	6	Stanislaus	8,930	54,036	$ 19,586	$ 2,193
Artichokes	3	Monterey	7,548	52,117	$ 73,200	$ 9,698
Asparagus	3	San Joaquin	17,961	29,614	$ 64,790	$ 3,607
Avocados	1	Monterey	221	623	$ 938	$ 4,244
Barley	4	Stanislaus	12,457	15,031	$ 29,422	$ 2,362
Beans	6	Stanislaus	32,632	19,780	$ 32,485	$ 995
Beets	1	Merced	2,477	74,310	$ 2,972	$ 1,200
Blueberries	2	San Joaquin	528	1,140	$ 9,438	$ 17,875
Bok Choy	1	Monterey	370	7,400	$ 2,001	$ 5,408
Broccoli	5	Monterey	43,076	319,237	$ 190,501	$ 4,422
Brussel Sprouts	2	Santa Cruz	1,965	20,346	$ 14,329	$ 7,292
Bushberries	1	Santa Clara	41	176	$ 418	$ 10,195
Cabbage	3	Monterey	3,079	57,348	$ 19,514	$ 6,338
Carrots	1	Monterey	1,304	25,700	$ 9,700	$ 7,439
Cattle & Calves	23	Stanislaus	NA	792,082	$ 899,004	NA
Cauliflower	2	Monterey	15,925	135,350	$ 85,013	$ 5,338
Celery	3	Monterey	9,354	369,310	$ 110,173	$ 11,778
Chard	1	Monterey	701	6,000	$ 5,092	$ 7,264
Cherries, All	8	San Joaquin	21,420	36,599	$ 154,109	$ 7,195
Chinese Veg	1	Santa Clara	523	9,623	$ 3,724	$ 7,120
Cilantro	2	Monterey	1,319	11,832	$ 11,527	$ 8,739
Citrus	1	Stanislaus	356	5,340	$ 2,403	$ 6,750
Corn	3	Contra Costa	19,548	97,204	$ 16,340	$ 836
Cucumbers	2	San Joaquin	2,036	11,922	$ 2,917	$ 1,433
Eggs **	2	Stanislaus	NA	60,033	$ 39,970	NA
Figs	1	Merced	2,507	2,240	$ 2,763	$ 1,102
Garlic	1	Santa Clara	67	422	$ 217	$ 3,239
Goats	2	El Dorado	NA	NA	$ 672	NA
Grapes, Table	2	San Joaquin	95,240	516,570	$ 211,607	$ 2,222
Grapes, Wine	9	Napa	161,975	708,017	$ 1,223,698	$ 7,555
Hogs, Pigs	9	Stanislaus	NA	3,651	$ 4,879	$ 67
Honey	7	Merced	NA	1,690	$ 2,781	NA
Kale	1	Monterey	1,999	21,600	$ 16,438	$ 8,223
Kiwifruit	2	Yuba	399	2,901	$ 4,636	$ 11,619
Leeks	2	Monterey	359	4,179	$ 4,095	$ 11,407
Lettuce, All	4	Monterey	188,171	2,849,251	$ 1,151,592	$ 6,120
Melons, All	5	San Joaquin	31,094	181,821	$ 51,554	$ 1,658
Milk, All	11	Stanislaus	NA	3,787,378	$ 894,720	NA
Misc, Fruit & Nuts	20	Yuba	11,830	4,674	$ 60,002	$ 5,072
Misc, Vegetables & Field Crops	19	Santa Cruz	65,927	NA	$ 193,923	$ 2,941
Mushrooms	3	Monterey	309	42,273	$ 139,432	$ 451,236
Nectarine	2	Stanislaus	275	800	$ 1,262	$ 4,589
Oats	5	Monterey	7,358	12,795	$ 1,338	$ 182
Olives	2	Napa	356	516	$ 328	$ 921
Onions	5	Monterey	7,514	170,391	$ 62,643	$ 8,337
Parsley	1	Monterey	446	6,600	$ 4,945	$ 11,087
Peaches, All	9	Stanislaus	28,704	285,410	$ 136,571	$ 4,758
Pears	6	Sacramento	11,947	194,943	$ 59,761	$ 5,002
Peas	2	Monterey	1,783	583	$ 24,268	$ 13,611
Peppers	5	San Benito	6,071	141,062	$ 59,495	$ 9,800
Persimmons	1	Sutter	259	925	$ 439	$ 1,695
Pistachios	1	Merced	4,301	5,589	$ 24,184	$ 5,623
Plums	6	Sutter	31,764	86,847	$ 117,807	$ 3,709
Potatoes	3	Merced	15,213	229,386	$ 136,642	$ 8,982
Poultry	6	Merced	NA	420,008	$ 504,010	NA
Prunes	4	Solano	3,805	8,300	$ 9,904	$ 2,603
Pumpkins	5	San Joaquin	4,531	68,867	$ 17,203	$ 3,797

Table A1.1: 2006 Commodity Production in the San Francisco Foodshed Study Area
Page 2, Radicchio - Wheat

Commodity	# Co	Top Producer	Acres	Tons	$ x 1000	$/Ac
Raddichio	2	Monterey	2,609	10,774	$ 14,470	$ 5,546
Radish	1	Monterey	170	2,600	$ 1,188	$ 6,988
Rappini	1	Monterey	3,730	14,000	$ 17,153	$ 4,599
Raspberries	2	Santa Cruz	2,064	26,837	$ 106,040	$ 51,376
Rice	10	Sutter	355,297	1,050,994	$ 344,607	$ 970
Safflower	4	Yolo	32,351	21,361	$ 10,432	$ 322
Seafood	2	Sonoma	NA	1,728	$ 3,878	NA
Sheep & Lamb	17	Merced	NA	12,701	$ 17,791	NA
Spices/Herbs	1	Stanislaus	1,230	3,100	$ 2,418	$ 1,966
Spinach	4	Monterey	14,663	131,454	$ 99,880	$ 6,812
Squab #	1	Stanislaus	NA	558,000	$ 1,886	NA
Squash	6	Monterey	1,574	50,988	$ 5,952	$ 3,781
Strawberries	8	Monterey	13,021	468,162	$ 586,538	$ 45,046
Sunflower	2	Yolo	23,238	3,242	$ 15,117	$ 651
Tomatoes, All	13	San Joaquin	174,434	4,859,673	$ 492,198	$ 2,822
Turkeys	3	Stanislaus	NA	104,451	$ 103,983	NA
Walnuts	18	San Joaquin	132,014	222,317	$ 356,351	$ 2,699
Watermelons	2	Solano	397	2,682	$ 956	$ 2,408
Wheat	11	San Joaquin	85,736	178,833	$ 21,520	$ 251
Total	25		2,035,785	20,174,890	$ 9,939,960	

Total of all commodities does not agree with total calculated by county ($10,096,312) due to omission of very small volume commodities.

Volume in number of birds ** 78,413,000 dozen @ 0.1276 lb/egg

Source: County Agriculture Commissioner Reports

Table A1.2: 2006 Market Value of Production at Farm Gate in San Francisco Foodshed Study Area (x 1,000)

County	Total	Fruits	Vegetables	Protein	Milk	Grains	Nuts, Oils, Herbs	Highest Grossing Products
Alameda	$ 10,074	$ 45	$ 1,153	$ 8,876				Beef cattle, vegetables
Amador	$ 11,383	$ 547	$ 229	$ 10,380			$ 227	Beef cattle, vegetables
Calaveras	$ 11,430	$ 115	$ 200	$ 10,216			$ 899	Beef cattle, poultry
Colusa	$ 343,577		$ 42,427	$ 12,181		$ 164,596	$ 124,373	Rice, almonds, tomatoes
Contra Costa	$ 55,965	$ 12,710	$ 22,506	$ 18,406		$ 807	$ 1,536	Beef cattle, corn, table grapes
El Dorado	$ 12,833	$ 5,356		$ 7,355			$ 122	Beef cattle, apples
Lake	$ 55,392	$ 51,145	$ 182	$ 2,619			$ 1,446	Wine grapes, pears
Marin	$ 43,231	$ 606	$ 1,570	$ 13,952	$ 27,083	$ 20		Milk, beef cattle, seafood
Mendocino	$ 31,606	$ 19,066	$ 955	$ 8,158	$ 3,427			Pears, beef cattle, milk
Merced	$ 947,392	$ 57,942	$ 249,809	$ 584,770		$ 4,124	$ 50,747	Poultry, beef cattle, tomatoes, potatos
Monterey	$ 2,566,882	$ 669,498	$ 1,857,834	$ 21,443	$ 3,516	$ 2,403	$ 12,188	Lettuce, strawberries, wine grapes, broccoli, celery
Napa	$ 473,866	$ 469,675	$ 256	$ 3,648			$ 287	Wine grapes, beef cattle
Placer	$ 30,751	$ 4,436	$ 1,391	$ 12,684		$ 9,204	$ 3,036	Beef cattle, rice, walnuts
Sacramento	$ 130,602	$ 34,988	$ 36,264	$ 54,106	$ 41,140	$ 5,244		Milk, pears, poultry
San Benito	$ 228,389	$ 30,712	$ 162,403	$ 27,012		$ 163	$ 8,099	Lettuce, peppers, beef cattle
San Joaquin	$ 1,346,821	$ 414,566	$ 261,768	$ 123,610	$ 261,030	$ 8,758	$ 277,089	Milk, table grapes, tomatoes, almonds
San Mateo	$ 26,708	$ 1,512	$ 22,811	$ 2,168		$ 90	$ 127	Mushrooms, Brussels sprouts, vegetables
Santa Clara	$ 128,879	$ 9,834	$ 117,637		$ 772		$ 636	Mushrooms, peppers, vegetables
Santa Cruz	$ 322,984	$ 258,956	$ 58,983	$ 5,045				Strawberries, raspberries, vegetables
Solano	$ 152,222	$ 16,830	$ 47,559	$ 35,942	$ 10,674	$ 12,249	$ 28,968	Beef cattle, tomatoes, walnuts
Sonoma	$ 527,184	$ 435,735	$ 7,417	$ 16,634	$ 67,297	$ 101		Wine grapes, milk, beef cattle
Stanislaus	$ 1,910,706	$ 111,204	$ 144,737	$ 619,228	$ 466,495	$ 31,024	$ 511,507	Milk, almonds, beef cattle, poultry
Sutter	$ 309,251	$ 105,839	$ 21,388	$ 15,980		$ 110,902	$ 55,142	Rice, plums, walnuts, peaches
Yolo	$ 265,775	$ 51,965	$ 110,311	$ 13,789	$ 5,243	$ 37,036	$ 47,431	Tomatoes, wine grapes, almonds
Yuba	$ 152,409	$ 73,914	$ 4,269	$ 6,727	$ 8,043	$ 35,715	$ 23,741	Plums, rice, walnuts, peaches
Total	$ 10,096,312	$ 2,837,196	$ 3,174,059	$ 1,634,929	$ 894,720	$ 422,436	$ 1,147,601	Wine grapes, lettuce, beef cattle, almonds

Source: County Agriculture Commissioner Reports

Table A1.3: 2006 Production Volume by Weight in San Francisco Foodshed Study Area(Tons)

County	Fruits*	Vegetables	Protein**	Milk	Grains	Nuts, Oils, Herbs
Alameda	NA	NA	4,275			
Amador	NA		5,354			215
Calaveras	100		4,945			728
Colusa		385,656	-		385,656	47,413
Contra Costa	15,311	104,361	9,700		5,747	933
El Dorado	242		3,885			76
Lake	30,390		1,447			823
Marin			8,141	110,500	196	
Mendocino	39,741		4,855	1,309		
Merced	97,879	979,173	416,424		25,508	14,361
Monterey	294,630	3,857,677	16,927	14,800	23,000	10,617
Napa			1,352			399
Placer	2,104	NA	4,967		39,249	2,261
Sacramento	122,054	248,124	9,265	172,082	28,160	
San Benito	26,926	275,785	10,548		1,310	1,339
San Joaquin	733,980	1,850,300	79,453	1,110,650	56,600	112,900
San Mateo	NA	13,143	1,672		705	
Santa Clara	5,269	152,297		3,391		242
Santa Cruz	176,015	88,614				
Solano	3,860	377,428	2,655	43,284	50,382	12,719
Sonoma	29,878	NA	9,433	291,027	604	
Stanislaus	73,121	1,617,100	357,493	1,988,050	18,480	142,400
Sutter	164,953	231,218	6,265		397,315	28,758
Yolo	19,091	1,333,492	6,560		161,833	19,822
Yuba	82,143	NA	72	32,721	133,763	16,067
Total	1,917,688	11,514,368	965,686	3,767,814	1,328,508	412,073

* Fruits do not include wine grapes.

** Protein includes all livestock and poultry products and farmed seafood.

NA indicates food group is produced, but no data are available, probably because volume is small..

Source: County Agriculture Commissioner Reports

Table A1.4: 2002 Organic and Direct-to-Consumer Sales of Agricultural Products in San Francisco Foodshed Study Area

County	Direct-to-Consumer Sales				Organic Sales		
	Value x 1,000		As Pct of Total Sales	Farms in 2002	Value x 1,000	As Pct of Crop Sales	Farms in 2002
	1997	2002					
Alameda	$ 114	$ 168	2.3%	23	NA	NA	NA
Amador	$ 154	$ 109	1.3%	40	$ 385	3.7%	6
Calaveras	$ 112	$ 171	2.0%	61	$ 62	0.6%	17
Colusa	$ 124	$ 84	0.0%	7	$ 1,130	0.4%	17
Contra Costa	$ 948	$ 1,163	2.8%	79	$ 36	0.1%	6
El Dorado	$ 580	$ 1,302	13.8%	198	$ 116	1.0%	19
Lake	$ 322	$ 206	0.5%	67	$ 473	0.9%	28
Marin	$ 559	$ 1,194	3.8%	29	$ 1,795	4.6%	13
Mendocino	$ 910	$ 607	2.6%	152	$ 3,236	11.3%	48
Merced	$ 2,459	$ 5,436	0.8%	114	$ 5,459	0.6%	30
Monterey	$ 3,378	$ 2,345	0.1%	91	$ 9,941	0.4%	26
Napa	$ 473	$ 729	0.2%	65	$ 452	0.1%	17
Placer	$ 491	$ 1,094	4.8%	204	$ 601	2.1%	23
Sacramento	$ 3,145	$ 2,054	2.1%	177	$ 61	0.1%	20
San Benito	$ 586	$ 484	0.3%	51	$ 5,823	2.8%	36
San Joaquin	$ 6,271	$ 8,165	0.8%	200	$ 871	0.1%	34
San Mateo	$ 609	$ 491	2.5%	20	$ 35	0.1%	5
Santa Clara	$ 1,664	$ 1,911	2.0%	102	$ 347	0.3%	5
Santa Cruz	$ 3,439	$ 3,556	1.5%	103	$ 2,467	0.8%	33
Solano	$ 752	$ 2,510	2.2%	89	$ 1,408	1.0%	19
Sonoma	$ 2,867	$ 5,866	1.5%	350	$ 6,829	1.4%	105
Stanislaus	$ 3,470	$ 4,920	0.4%	209	$ 4,667	0.3%	36
Sutter	$ 408	$ 812	0.4%	65	$ 2,648	0.9%	32
Yolo	$ 2,887	$ 8,309	4.3%	92	$ 3,649	1.5%	29
Yuba	$ 579	$ 360	0.3%	100	$ 1,420	1.0%	21
Total	$ 37,301	$ 54,046	0.7%	2,688	$ 53,911	0.6%	625

* Assumes 9% annual growth in sales from 2002 to 2006 based on historic trend.

** Assumes 10% annual growth in sales from 2002 to 2006

Source: U.S. Census of Agriculture

Note: Sales are not limited to consumers in the City of San Francisco

Appendix 2

Estimating Consumption Using Regional and National Statistics

The total food supply is estimated by the USDA at the national level as the Loss-Adjusted Food Availability Data[1], which is a record of all food produced in the country, adjusted for imports and exports and divided by total population. In order to estimate food consumption by studying reported diets, several large-scale surveys of dietary intake are administered at the national level. We used the Food Commodity Intake Database (FCID)[2], which records respondents' region of residence; we used data for residents of major cities in the Western U.S. Comparison of the Loss-Adjusted Food Availability Data and the Food Commodity Intake Database shows a large difference. Other researchers comparing estimates of the food supply and dietary surveys have found similar discrepancies.[3]

There are no food supply estimates or dietary surveys specific to San Francisco at the level of detail offered by these national and regional studies, so we have chosen to base our estimates of food consumption in San Francisco on these datasets, which are administered consistently and updated regularly. These data should be reasonably representative of patterns in San Francisco.

Each data set we used to compare consumption and production (the Loss Adjusted Food Availability data, the FCID, and the County Agriculture Commissioners' crop reports) employs a slightly different classification system for sorting commodities into food groups. To facilitate comparison of consumption and production numbers, we reclassified each commodity listed in our consumption data to conform to the categories used in the crop reports, adding a few additional categories to cover consumption data for commodities not reported by the Agriculture Commissioners.

Differences in maximum consumption numbers when aggregating by food group or commodity-by-commodity are due to how the maximum numbers were chosen: when aggregating by food group, whichever overall food group estimate was the highest was chosen as the "maximum" estimate for that food group (the highest estimate in the case consistently came from the *primary weight* category). Aggregating commodity-by-commodity allowed us to work at a finer level of detail and choose a maximum estimate for each individual commodity; this sometimes came from the *primary weight* category, and sometimes from the *dietary survey* category.

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1 The Loss-Adjusted Food Availability is refined to account for losses due to spoilage, waste and other losses, resulting in a data set known as the "ERS Loss-Adjusted Food Availability Data", frequently used as a proxy for actual food consumption. http://www.ers.usda.gov/Data/FoodConsumption/FoodGuideDoc.htm

2 The Food Commodity Intake Database (FCID) is based on a comprehensive survey of food intake carried out by the USDA Agricultural Research Service. One advantage of using the FCID rather than other diet survey databases is that it uses a set of recipe files to convert foods eaten by respondents to their component commodities, giving us an estimate of the total weight of each commodity consumed rather than total weight of individual food items like "minestrone soup" or "cheeseburger". Another advantage is that the data can be filtered to show responses from each region of the United States, and sorted according to whether the respondent lives in one of the main (or "central") cities that make up Metropolitan Statistical Areas. We used data from respondents living in central cities in the Western region.

3 Pollan, Michael. *In Defense of Food: An Eater's Manifesto*. 2008. New York: Penguin Press. Page 76.

Table A2.1: Annual Per Capita Consumption of Commodities (Pounds)

Page 1, Almonds - Pumpkins

	Loss-Adjusted Food Availability		Food Commodity Intake Database		Maximum
Commodity	Primary Weight Per Capita (lbs)	Consumer Weight Per Capita (lbs)	Dietary Survey Weight Per Capita (lbs)	Percent Change from Consumer Weight	Largest Per Capita Consumption Estimate (lbs)
Almonds	1	0	0	- 48%	1
Anise	-	-	-	-	-
Apples	23	18	46	+ 150%	46
Apricots	1	0	1	+ 105%	1
Artichokes	1	1	0	- 79%	1
Asparagus	1	1	1	- 27%	1
Avocados	3	3	1	- 66%	3
Barley	1	1	4	+ 583%	4
Beans	14	11	8	- 25%	14
Beets	-	-	0	-	0
Blueberries	1	1	1	- 17%	1
Bok Choy	-	-	-	-	-
Broccoli	8	6	4	- 44%	8
Brussel Sprouts	0	0	0	+ 9%	0
Bushberries	0	0	2	+ 1104%	2
Cabbage	9	7	3	- 65%	9
Carrots	12	9	7	- 21%	12
Cattle & Calves	94	58	23	- 61%	94
Cauliflower	2	1	1	- 47%	2
Celery	6	5	2	- 50%	6
Chard	-	-	-	-	-
Cherries, All	2	1	1	- 33%	2
Chinese Veg	-	-	-	-	-
Cilantro	-	-	-	-	-
Citrus	31	22	47	+ 111%	47
Corn	58	43	17	- 61%	58
Cucumbers	10	7	3	- 59%	10
Eggs	254	230	15	- 93%	254
Figs	0	0	0	+ 74%	0
Garlic	2	2	0	- 83%	2
Goats	-	-	0	-	0
Grapes, Table	16	8	13	+ 57%	16
Grapes, Wine	-	-	8	-	8
Hogs, Pigs	64	43	9	- 79%	64
Honey	1	1	1	- 45%	1
Kale	0	0	0	- 99%	0
Kiwifruit	1	0	0	- 43%	1
Leeks	-	-	0	-	0
Lettuce, All	32	27	8	- 68%	32
Melons, All	12	10	4	- 55%	12
Milk, All	181	159	237	+ 49%	237
Misc, Fruit & Nuts	-	-	-	-	-
Misc, Vegetables & Field Crops	-	-	-	-	-
Mushrooms	4	3	1	- 66%	4
Nectarine	-	-	1	-	1
Oats	5	4	4	+ 9%	5
Olives	0	0	0	+ 112%	0
Onions	23	18	8	- 54%	23
Parsley	-	-	-	-	-
Peaches, All	7	6	4	- 32%	7
Pears	6	6	4	- 23%	6
Peas	3	1	3	+ 213%	3
Peppers	13	9	3	- 70%	13
Persimmons	-	-	0	-	0
Pistachios	0	0	0	- 81%	0
Plums	7	4	1	- 81%	7
Potatoes	127	68	26	- 62%	127
Poultry	100	56	18	- 68%	100
Prunes	0	0	0	+ 939%	0
Pumpkins	5	4	0	- 98%	5

Table A2.1: Annual Per Capita Commodity Consumption (Pounds)

Page 2, Radicchio - Wheat

Commodity	Loss-Adjusted Food Availability		Food Commodity Intake Database		Maximum
	Primary Weight Per Capita (lbs)	Consumer Weight Per Capita (lbs)	Dietary Survey Weight Per Capita (lbs)	Percent Change from Consumer Weight	Largest Per Capita Consumption Estimate (lbs)
Raddichio	-	-	-	-	-
Radish	0	0	0	- 48%	0
Rappini	-	-	-	-	-
Raspberries	0	0	1	+ 167%	1
Rice	21	19	14	- 25%	21
Safflower	-	-	-	-	-
Seafood	16	15	7	- 52%	16
Sheep & Lamb	1	1	0	- 87%	1
Spices/Herbs	-	-	-	-	-
Spinach	3	2	1	- 48%	3
Squab	-	-	-	-	-
Squash	5	3	2	- 35%	5
Strawberries	8	7	3	- 49%	8
Sunflower	-	-	-	-	-
Tomatoes, All	94	44	29	- 35%	94
Turkeys	17	12	5	- 61%	17
Walnuts	0	0	0	- 73%	0
Watermelons	14	11	6	- 46%	14
Wheat	122	108	51	- 52%	122
Fruit, Other	40	33	28	- 15%	40
Vegetables, Other	13	10	7	- 35%	13
Meats, Other	-	-	0	-	0
Milk Products, Other	103	93	11	- 88%	103
Grains, Other	12	11	0	- 97%	12
Herbs, Spices, Nuts, and Oils, Other	90	72	34	- 52%	90
Sugars (not recorded by Ag Comm.)	141	125	52	- 58%	141
Total	*1,842*	*1,423*	*795*	*- 44%*	*1,954*
Total, adjusted*	1,701	1,298	743	*- 43%*	1,813

* Does not include sugars, as they are not recorded in the Agriculture Commissioners' production data

Source: Loss-Adjusted Food Availability Data, USDA/Economic Research Service, data last updated Feb 15, 2007; Food Commodity Intake Database data derived from Revised Food Commodity Intake Database (used data for city-dwellers in Western states), USDA/ Agriculture Research Service, Mar 8, 2004

Note: This table uses the Loss-Adjusted Food Availability commodity categories; FCID commodities have been re-categorized. Values listed as “0” are too small to be expressed without decimals.

Table A2.2: Comparison of Annual San Francisco and Bay Area Consumption and San Francisco Foodshed Study Area Annual Production, in Tons

Page 1, Almonds - Pumpkins

	Production	San Francisco Consumption		Bay Area Consumption	
Commodity	2006 San Francisco Foodshed Study Area Commodity Production (tons)	Maximum SF Consumption Estimate (tons)	San Francisco Max Consumption as Percentage of Study Area Production	Maximum SF Consumption Estimate (tons)	Bay Area Max Consumption as Percentage of Study Area Production
Almonds	302,326	289	0%	1,821	1%
Anise	9,700	-	0%	-	0%
Apples	167,125	25,072	15%	157,801	94%
Apricots	54,036	605	1%	3,810	7%
Artichokes	52,117	346	1%	2,180	4%
Asparagus	29,614	799	3%	5,030	17%
Avocados	623	1,814	291%	11,414	1832%
Barley	15,031	2,269	15%	14,279	95%
Beans	19,780	7,725	39%	48,622	246%
Beets	74,310	124	0%	783	1%
Blueberries	1,140	421	37%	2,648	232%
Bok Choy	7,400	-	0%	-	0%
Broccoli	319,237	4,590	1%	28,889	9%
Brussel Sprouts	20,346	159	1%	1,000	5%
Bushberries	176	1,223	695%	7,695	4372%
Cabbage	57,348	5,117	9%	32,204	56%
Carrots	25,700	6,466	25%	40,694	158%
Cattle & Calves	792,082	51,581	7%	324,649	41%
Cauliflower	135,350	1,029	1%	6,478	5%
Celery	369,310	3,345	1%	21,056	6%
Chard	6,000	-	0%	-	0%
Cherries, All	36,599	982	3%	6,179	17%
Chinese Veg	9,623	-	0%	-	0%
Cilantro	11,832	-	0%	-	0%
Citrus	5,340	25,881	485%	162,895	3050%
Corn	97,204	31,693	33%	199,476	205%
Cucumbers	11,922	5,669	48%	35,681	299%
Eggs	60,033	139,668	233%	879,068	1464%
Figs	2,240	167	7%	1,052	47%
Garlic	422	1,321	313%	8,312	1970%
Goats	-	74	-	466	-
Grapes, Table	516,570	8,961	2%	56,402	11%
Grapes, Wine	708,017	4,189	1%	26,367	4%
Hogs, Pigs	3,651	35,082	961%	220,808	6047%
Honey	1,690	567	34%	3,567	211%
Kale	21,600	215	1%	1,354	6%
Kiwifruit	2,901	292	10%	1,837	63%
Leeks	4,179	3	0%	20	0%
Lettuce, All	2,849,251	17,812	1%	112,110	4%
Melons, All	181,821	6,600	4%	41,540	23%
Milk, All	3,787,378	130,460	3%	821,118	22%
Misc, Fruit & Nuts	4,674	-	0%	-	0%
Misc, Vegetables & Field Crops	-	-	-	-	-
Mushrooms	42,273	2,162	5%	13,605	32%
Nectarine	800	746	93%	4,696	587%
Oats	12,795	2,506	20%	15,775	123%
Olives	516	197	38%	1,241	241%
Onions	170,391	12,474	7%	78,512	46%
Parsley	6,600	-	0%	-	0%
Peaches, All	285,410	3,840	1%	24,168	8%
Pears	194,943	3,485	2%	21,935	11%
Peas	583	1,919	329%	12,080	2072%
Peppers	141,062	6,934	5%	43,644	31%
Persimmons	925	190	21%	1,197	129%
Pistachios	5,589	105	2%	660	12%
Plums	86,847	3,664	4%	23,059	27%
Potatoes	229,386	70,004	31%	440,606	192%
Poultry	420,008	55,206	13%	347,467	83%
Prunes	8,300	167	2%	1,054	13%
Pumpkins	68,867	2,770	4%	17,432	25%

Table A2.2: Comparison of Annual San Francisco and Bay Area Consumption and San Francisco Foodshed Study Area Annual Production, in Tons

Page 2, Radicchio-Wheat

	Production	San Francisco Consumption		Bay Area Consumption	
Commodity	2006 San Francisco Foodshed Study Area Commodity Production (tons)	Maximum SF Consumption Estimate (tons)	San Francisco Max Consumption as Percentage of Study Area Production	Maximum SF Consumption Estimate (tons)	Bay Area Max Consumption as Percentage of Study Area Production
Raddichio	10,774	-	0%	-	0%
Radish	2,600	271	10%	1,706	66%
Rappini	14,000	-	0%	-	0%
Raspberries	26,837	377	1%	2,370	9%
Rice	1,050,994	11,574	1%	72,845	7%
Safflower	21,361	-	0%	-	0%
Seafood	1,728	8,870	513%	55,828	3231%
Sheep & Lamb	12,701	656	5%	4,128	33%
Spices/Herbs	3,100	-	0%	-	0%
Spinach	131,454	1,622	1%	10,206	8%
Squab	558,000	-	0%	-	0%
Squash	50,988	2,571	5%	16,184	32%
Strawberries	468,162	4,214	1%	26,520	6%
Sunflower	3,242	-	0%	-	0%
Tomatoes, All	4,859,673	51,747	1%	325,698	7%
Turkeys	104,451	9,148	9%	57,579	55%
Walnuts	222,317	233	0%	1,465	1%
Watermelons	2,682	7,590	283%	47,771	1781%
Wheat	178,833	67,254	38%	423,298	237%
Fruit, Other	-	21,761	-	136,965	-
Vegetables, Other	-	7,375	-	46,419	-
Meats, Other	-	121	-	759	-
Milk Products, Other	-	56,438	-	355,222	-
Grains, Other	-	6,763	-	42,565	-
Herbs, Spices, Nuts, and Oils, Other	-	49,549	-	311,861	-
Sugars (not recorded by Ag Comm.)	-	77,337	-	486,759	-
Total	*20,174,890*	*1,074,449*		*6,762,585*	
Total, adjusted*	20,174,890	997,112	5%	6,275,826	31%

* Does not include sugars, as they are not recorded in the Agriculture Commissioners' production data

Note: Maximum estimate consumption column represents the highest of the estimates for each individual commodity

Source: Loss-Adjusted Food Availability Data, USDA/Economic Research Service, data last updated Feb 15, 2007; Food Commodity Intake Database data derived from Revised Food Commodity Intake Database (used data for city-dwellers in Western states), USDA/ Agriculture Research Service, Mar 8, 2004; Production data from County Agriculture Commissioner Reports