SEASONAL DAIRY GRAZING: A VIABLE ALTERNATIVE FOR THE 21ST CENTURY

A case study of six successful dairy farms using seasonal calving and management-intensive grazing

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SEASONAL DAIRY GRAZING: A VIABLE ALTERNATIVE FOR THE 21ST CENTURY

By Jonathan R. Winsten and Bryan T. Petrucci

Economic forces in the dairy industry continue to push up the herd size of U.S. dairy farms. The average size of U.S. dairy herds increased by 68 percent between 1992 and 2002, from 72 to 124 cows (Olson, 2002), with many farms implementing plans to grow into the several-hundred to several-thousand cow range. The most common expansion strategy for dairy farms is a confinement management system. In a confinement operation, the herd is maintained in a protected environment, usually inside a building or on a feedlot, with all nutritional inputs carefully controlled to maximize milk production. While this approach can be economically successful, it requires a relatively large investment in buildings and machinery that is often beyond the financial means of many dairy farmers.

With today's volatile milk prices, many mid-career dairymen would rather go out of business than expand and assume several million dollars of debt. Starting a confinement operation is also very difficult for beginning farmers. Lacking equity, they do not have access to the capital required to build and operate a large confinement system. The cost-price squeeze in today's dairy industry causes many farmers to believe that "get big or get out" is the only option available to them. Consequently, the number of U.S. dairy farms continues to decrease at an alarming rate, with the total number of dairies shrinking by 4 percent to 8 percent each year (American Farm Bureau, 2001). The United States lost 44 percent of its dairy farms (57,523) from 1992 to 2002 (Olson, 2002). As of July 2002, there were approximately 74,012 dairy farms operating in the United States.

Over the last decade a promising alternative to large-scale confinement dairies has emerged that is being adopted by farmers in many parts of the United States. Seasonal dairy grazing is a production system that utilizes management-intensive grazing (MIG) in conjunction with a spring calving schedule. The fundamental idea is to match the nutrient requirements of the dairy herd with the annual growth cycle of pasture forages. With seasonal dairy grazing, operating and overhead costs can be kept quite low, and well within the means of most farmers. Herds in the 75 to 150 cow range are economically viable, and can often be managed with less labor than a similar sized confinement system. Grass-based operations can also be established on modest sized farms (100 to 300 acres) that are often considered marginal for conventional agricultural production.

With seasonal dairy grazing, cows are bred to calve together as a group during a 60 to 80 day window in the spring. After giving birth, cows "freshen," and enter a period of heavy milk production that requires a high level of nutrition. When calving is timed to occur just before the rapid pasture growth of late spring and early summer, abundant, high-quality feed can be harvested by the animals at a very low cost to the producer. With good management and adequate acreage, pastures can provide all the forage requirements needed by a dairy herd until the end of the growing season, and produce surplus grass that can be made into hay or sileage for winter feeding. As pastures become dormant for the winter, and cows near the end of their lactation cycle, the herd is "dried off." Milk production ceases until the calving cycle starts again the following spring.

Seasonal dairy grazing has a number of advantages for dairy producers. It gives graziers the ability to focus on key tasks, concentrate their efforts, and then move on. For example, although calving a large group of animals during a short period of time can be very demanding, a producer can focus almost exclusively on the special needs of new calves and post-partem cows. When calving is finished, he/she can shift gears and move on to other seasonal, management-intensive tasks like breeding and making hay A number of new technologies and management practices have been introduced to U.S. farmers in recent years that makes it easier to tackle large tasks like group calf rearing. Many of these strategies have come from New Zealand, where the entire dairy industry is on a seasonal grass-based schedule.

Seasonal dairy graziers also have the advantage of a 30 to 60 day break with no milking during the winter dry period. Many producers use this time to make repairs or renovations, or to vacation and get away from the farm altogether. On some operations, the dry period has even made it possible to reduce the hired labor needs of the farm. Almost all graziers (those with seasonal and year-round herds) feel that the adoption of pasture-based farming makes it possible for them to spend more time with their families.

Seasonal dairy grazing has many economic and environmental benefits relative to conventional production systems. Seasonal dairy graziers are often able to produce high net returns simply by keeping their costs low. Because pasture is the primary feed input, less machinery is needed and crop production costs tend to be lower. Seasonal operations do not need winterized milking facilities and dry animals can be housed with minimal facilities at almost no cost. While a modest sized (100 to 200 cows) conventional dairy operation can have several million dollars invested in buildings, machinery and equipment, the investment required for a seasonal grass-based operation of similar size can easily be kept in the $350 to $500K range.

All things being equal, lower capital investment results in lower debt per cow for grass-based operations. This permits greater economic flexibility, allowing for profit maximization under a wider range of cost/price conditions. And although milk production per cow tends to be lower for seasonal dairy graziers when compared to confinement operations, profit per cow (and per cwt.) is very competitive, as indicated in the following farm financial results.

Reduced labor per cow and specialized milking facilities create exceptional labor efficiency for dairy graziers. Fast, simple, herringbone milking parlors based on New Zealand designs are used by many grass-based producers to milk cows quickly. A 16-unit herringbone parlor can milk 100+ cows per hour with one man operating the system. The production of 750,000+ pounds of milk sold per worker is reported on many seasonal dairy operations, with some operations exceeding 1 million pounds of milk per worker.

Communities in every part of the United States are concerned about the environmental impacts of large confinement dairies. Water quality, pesticide contamination, odor and flies are all very real concerns for those living in close proximity to large confinement operations. Alternatively, a typical 100 cow grass-based dairy can alleviate most of those concerns and provide aesthetic benefits to the rural landscape as well. Because hay and pasture are usually the only crops grown, there is no annual tillage and little pesticide use. Cows out on grass spread their own manure, so except for a small amount of wash water and manure collected at the milking facility, there are not large amounts of livestock waste to store and spread. Most importantly, grass-based dairy operations maintain a permanent vegetative cover that absorbs nutrients, reduces runoff and minimizes soil erosion throughout the year.

Although it is estimated that between 5 percent to 15 percent of all dairy farmers can be considered graziers, currently only a very small percentage use seasonal dairy grazing; we estimate the total to be from 0.1 percent to 1 percent of farms in the northeastern and Midwest states. However, farmers using this system are demonstrating just how successful seasonal dairy grazing can be. They are profitable despite the low milk prices and high operating costs that put many other dairy farms out of business. Dairy grazing, when combined with a seasonal calving schedule, has the potential to become a very powerful tool for protecting farmland, reducing environmental impacts and revitalizing rural communities throughout the United States.

THE CASE STUDIES

In an attempt to increase recognition that seasonal dairy grazing is a viable expansion alternative for farmers in the Northeast and Midwest states, this report contains detailed information describing six farms that successfully use the system. It should be noted that the level of management skill possessed by each farmer included in this set of case studies is exceptionally high. Seasonal dairy grazing requires keen observation of pasture forage growth, effective time management skills and a thorough knowledge of animal husbandry. It can be very difficult to maintain a synchronized breeding/calving schedule with a dairy herd, and only the best managers are able to maintain seasonality year after year.

The following case studies include financial results for the subject farms through the year 2001. The numbers demonstrate profitability that is well above industry averages despite per cow milk production levels that would be considered unacceptably low for a conventional dairy operation. The case studies also show that there are many different approaches to seasonal, grass-based dairy farming. Some important elements that contribute to the financial success of these farms are increased labor efficiency, low feed costs, low veterinary expenses and low culling rates. All but one of the operations analyzed in this study were able to ship greater than 750,000 pounds of milk per full-time worker equivalent (FTE). For many of the farms, the use of a fast, high-throughput milking parlor plays a pivotal role in achieving this efficiency. Forage costs are minimized in these operations by matching herd requirements to nutrient production from pasture. While all six farms have below average grain costs per cwt. of milk produced, some are more successful than others at keeping this cost to a minimum. It is clear that significant savings accrue to these operations from dramatically reduced veterinary costs. Also significant but less obvious, is the increase in profitability for each farm due to very low annual culling rates of 10 percent to 12 percent, compared to an industry-wide average of 30 percent to 35 percent. While confinement operations will often cull a cow shortly after her fourth birthday, it is not uncommon for any grass-based dairy to be milking a good number of healthy animals in the five- to 10-year-old range.

For more information on seasonal dairy grazing, or to review an online version of this report, visit American Farmland Trust's electronic information site on grass-based farming systems at http://grassfarmer.com. Readers with comments or questions regarding individual case studies can correspond directly with the authors by sending email to jwintsten@winrock.org or bpetrucci@mindspring.com.

LARRY SHEARER
COLRAIN, MASSACHUSETTS

The Shearers farm 150 acres of pasture in the Berkshire Mountains of northwestern Massachusetts. The farm is hilly, with stony soils and cold winters. It is a two family partnership with Larry and his wife in semi-retirement, and their son and daughter-in-law providing most of the day-to-day labor and management. A second son also provides some hired labor on an as needed basis.

The herd consists of approximately 50 Holstein cows plus young stock with all replacements raised on site. They have been using intensive grazing since 1983 and seasonal milk production since 1991. The family's goal is to have all cows calve in a window from May 1 to June 15. Artificial insemination (AI) is used once on all cows with a clean-up bull servicing any animals that remain open. Livestock genetics are selected to produce offspring with a smaller stature and high milk components. Calf rearing has been simplified with barrel feeders and young animals turned out on grass as soon as possible.

The Shearer's herd average is around 16,000 pounds of milk sold per cow. In addition to pasture forages, each cow is fed a total mixed ration (TMR) that contains haylage, 15 to 20 pounds of corn silage and grain before coming into the milking parlor. The parlor and 50-cow open free-stall barn were built in 1964. Milking and clean-up take one person about two hours during early lactation.

Their pastures contain a mix of orchardgrass, bluegrass and white clover. Eight acres of perennial ryegrass and 12 acres of corn for silage are also used. The perimeter fencing is one strand of high tensile wire with one-acre interior subdivisions fenced with polywire. Buried plastic pipes provide water access in every paddock. The milkers are usually in each paddock for 12 to 24 hours, but the Shearers try to maintain a flexible grazing strategy that varies throughout the year.

Financial Results

According to the 2001 Northeast Dairy Farm Summary prepared by four northeast Farm Credit associations, the average farm in the Northeast region had 201 cows and produced over 20,000 pounds milk per cow. These farms are primarily confinement feeding operations with very little reliance on pasture forages. The Shearer farm is more like the typical Massachusetts dairy of 1973 than 2003. Their herd size is 25 percent of the average and relies heavily on pasture forage and low-cost production. They have fewer cows than the other farms in this study. However, with no debt, TMR feeding, and an efficient

production system, the Shearer's have been successful in generating enough income to support two families.

Farm profitability has been extremely high in each year of this study (1998-2001). While net farm income per cow decreased in 2001 due to slightly lower milk production and higher non-cash expenses (depreciation), it was still 50 percent greater than the average for New England, New York and New Jersey dairy farms ($751vs. $536, net farm earnings per cow is the corresponding measure in that report) (Sobson et al., 2002). The Shearer's net farm income per cwt. of milk sold from 1998 to 2001 ranged from 100 percent to 400 percent greater than the corresponding measure of the average for the larger Northeast farms (net farm earnings per cwt. 1998=$2.97; 1999=$2.51; 2000=$1.33; and 2001=$2.59) (Northeast Farm Credit, 1999-2002).

One of the Shearer's primary goals is to remain debt-free and they do not plan to expand herd size to a level that requires an additional investment in facilities. They feel that keeping overhead costs low is critical to their operation. Maintaining a low-investment/low-debt operation combined with relatively high production levels has allowed them to remain profitable in a state that has seen a dramatic decline in dairy farm numbers.

The success achieved by the Shearers cannot be attributed to any single factor like labor efficiency (less than 600,000 pounds per worker) or low grain costs ($3 per cwt. milk). However, having an efficient operation that uses existing facilities along with a smart supplemental feeding program has helped them produce more milk per cow than other seasonal operations. They keep their operating costs to a minimum and get the most from each animal within the limits of seasonal, grass-based management. The Shearers feel quite certain that they would not be in dairy farming today if they had not adopted seasonal calving and management intensive grazing.

Larry Shearer
Colrain, Massachusetts

Farm Statistics	1998	1999	2000	2001
System	Seasonal	Seasonal	Seasonal	Seasonal
Farm Workers (Total FTE)	1.5	1.5	2	2
Average Cows in Milk	52	50	54	50
Cows Culled (sold for beef)	7	5	5	5
Cows Culled (seasonal calving)	6	9	0	14
Lbs. Milk Sold/Cow	15,834	16,347	16,403	15,778
Total Lbs. Milk Sold	823,375	817,328	885,771	788,898
Avgerage Milk Price	$16.11	$16.02	$13.60	$16.54
Total Crop/Pasture Acres	150	150	240	240

Cash Income				
Total Value Milk Sold	$132,663	$130,939	$120,429	$130,504
Cull Cow & Calf Sales	$4,851	$7,930	$4,400	$15,116
Crop Sales	$2,960	$1,560	$2,156	$2,100
Other Farm Income	$11,730	$11,860	$15,898	$4,084
Total Cash Income	$152,204	$152,289	$142,883	$151,804

Cash Expenses				
Marketing and Hauling	$6,587	$6,539	$5,439	$9,793
Purchased Feed: Forage ($)	$0	$0	$0	$0
Purchased Feed: Grain ($)	$27,465	$21,660	$26,690	$23,850
Vet/Medicine/Hoof trimming	$1,470	$1,406	$2,701	$2,227
Breeding	$1,166	$1,240	$2,000	$1,921
Labor (paid)	$16,000	$16,000	$16,000	$17,800
DHIA	$0	$0	$0	$0
Custom/Machine Hire	$0	$0	$0	$0
Fertilizer/Lime/Chemical	$3,270	$2,640	$1,915	$2,484
Seed	$560	$870	$698	$992
Repairs	$4,067	$6,260	$10,564	$8,140
Fuel	$2,980	$3,890	$3,745	$4,451
Supplies	$4,730	$6,520	$7,235	$8,324
Utilities	$2,155	$2,185	$2,361	$3,146
Rent	$700	$700	$200	$700
Taxes (property)	$3,460	$3,760	$3,760	$3,820
Insurance	$3,320	$3,599	$3,600	$3,700
Farm Interest	$0	$0	$0	$0
Misc. Exp.	$500	$575	$428	$440
Total Cash Expenses	$78,430	$77,844	$87,336	$91,788

Net Cash Farm Income	$73,774	$74,445	$55,547	$60,016
Inventory Change	$4,000	-$5,000	$5,800	$2,000
(-) Depreciation	$14,756	$22,427	$13,529	$24,451
Net Farm Income	$63,018	$47,018	$47,818	$37,565

Summary	1998	1999	2000	2001
Total Cash Income/Cwt. Sold	$18.49	$18.63	$16.13	$19.24
Total Cash Expenses/Cwt. Sold	$9.53	$9.52	$9.86	$11.63
Net Cash Margin/Cwt. Sold	$8.96	$9.11	$6.27	$7.61
Net Farm Income	$63,018	$47,018	$47,818	$37,565
Net Farm Income per Cow	$1,212	$940	$886	$751
Net Farm Income per Cwt.	$7.65	$5.75	$5.40	$4.76
Culling Rate (sold for beef)	13.46%	10.00%	9.26%	10.00%
Culling Rate (seasonal breeding)	11.54%	18.00%	0.00%	28.00%
Grain Costs per Cwt. Milk	$3.34	$2.65	$3.01	$3.02
Lbs. Milk Sold per Worker	548,917	544,885	590,514	525,932

DAN AND RUTH VOSBERG
SOUTH WAYNE, WISCONSIN

The Vosbergs have been dairying on 283 acres in Southern Wisconsin for the past 11 years. The farm is rolling and has predominantly silt loam soils with 200 acres of permanent pasture. The major pasture species are orchardgrass, reed's canary grass and bromegrass. Through 2001 Dan and Ruth ran the farm with only part-time, seasonal help. They attribute their ability to operate with such low hired labor requirements to seasonal dairying.

Their milking herd, primarily Jerseys and Jersey crosses, grew from 95 cows in 1998 to 147 cows in 2001. They raise all of their replacements on the farm, and due to a low culling rate, generally have numerous heifer calves to sell each year. The breeding program consists of AI for one service and followed by a clean-up bull. The target date for drying-off the herd is January 15th, with the goal of having the entire herd calve between March 5th and May 1st.

Several years ago the Vosbergs retrofitted their stall barn into a 12-unit swing parlor, leaving room to add two to four additional units for future expansion. Milking 147 cows, with set-up and clean-up, generally takes two people about two hours or 2.5 hours with one person. The milking herd and young stock are outwintered. A hoop barn is used for loose housing in inclement weather and for cows close to calving.

The Vosbergs have been using management-intensive grazing since they moved to the farm in 1989 and have been fully seasonal for the last five years. They supplement the herd with corn silage, high-moisture shelled corn (HMSC), cottonseed, and roasted soybeans fed in the milking parlor. They raise 40 acres of corn for silage and produce baleage from excess pasture and hayland. Additionally, they usually purchase about 150 large, round bales of baleage each year.

Dan and Ruth are very happy with their operation and claim that they would not milk cows if they couldn't graze them. The Vosbergs also claim that they would not have been able to start farming without the low capital investment of a grass-based system. The longer they are seasonal, the more they like the system and the benefits it provides.

Financial Results

The Vosbergs have created a profitable and competitive dairy farm business. They steadily increased the size of their herd from 95 to 147 cows over the period 1998 to 2001, with milk production per cow in the range of 12,225 to 13,400 pounds. By limiting hired labor on the farm, they also increased their labor efficiency to nearly 1 million pounds of milk sold per FTE worker in 2001, which is an important component of their success. Due to these factors, the Vosbergs have developed an operation that should be able to remain profitable under a wide range of economic and weather conditions.

Compared to averages for Wisconsin dairy farms compiled by the UW Center for Dairy Profitability, the Vosbergs have consistently outperformed the majority of Wisconsin dairy farms. Even with a milk production level 35 percent to 40 percent less than the average dairy farm, the operation has yielded a net farm income per cow that is 25 percent to 118 percent higher than the corresponding figure (net farm income from operations (NFIFO) per cow) for Wisconsin farms (NFIFO per cow 1998=$716, 1999=$578, 2000=$296 and 2001=$520) (Frank, 1999-2002). The relative financial performance is even more impressive on a per cwt. basis. By this standard the Vosbergs' results are 93 percent to 234 percent greater than the Wisconsin average (NFIFO per cwt. 1998=$3.54; 1999=$2.86; 2000=$1.44; and 2001=$2.52).

Dan & Ruth Vosberg
South Wayne, Wisconsin

Farm Statistics	1998	1999	2000	2001
System	Seasonal	Seasonal	Seasonal	Seasonal
Farm Workers (Total FTE)	1.7	1.8	1.8	2.0
Average Cows in Milk	95	113	121	147
Cows Culled (sold for beef)	7	6	21	17
Cows Culled (seasonal calving)	5	2	4	0
Lbs. Milk Sold/Cow	12,602	12,225	13,408	12,891
Total Lbs. Milk Sold	1,197,146	1,381,370	1,622,421	1,894,923
Avgerage Milk Price	$18.81	$17.28	$14.63	$19.40
Total Crop/Pasture Acres	263	263	263	263

Cash Income				
Total Value Milk Sold	$225,184	$238,652	$237,293	$367,670
Cull Cow & Calf Sales	$4,006	$15,328	$11,559	$18,963
Crop Sales	$0	$0	$0	$0
Other Farm Income	$13,251	$16,939	$19,547	$9,207
Total Cash Income	$242,441	$270,919	$268,399	$395,840

Cash Expenses				
Marketing and Hauling	$1,013	$693	$1,328	$5,638
Purchased Feed: Forage ($)	$971	$1,000	$11,441	$13,234
Purchased Feed: Grain ($)	$32,789	$48,023	$57,339	$74,360
Vet/Medicine/Hoof trimming	$3,943	$7,140	$4,704	$7,223
Breeding	$577	$1,281	$1,492	$1,418
Labor (paid)	$0	$5,485	$2,983	$12,214
DHIA	$0	$0	$0	$0
Custom/Machine Hire	$9,048	$7,756	$11,415	$12,805
Fertilizer/Lime/Chemical	$18,105	$21,047	$18,962	$26,216
Seed	$2,158	$2,403	$1,962	$4,677
Repairs	$13,274	$8,053	$12,222	$22,149
Fuel	$3,208	$3,747	$1,635	$2,792
Supplies	$15,484	$20,003	$11,557	$13,116
Utilities	$4,613	$4,808	$5,180	$5,619
Rent	$2,903	$2,600	$0	$0
Taxes (property)	$3,035	$10,775	$4,338	$4,085
Insurance	$2,265	$2,868	$3,636	$3,371
Farm Interest	$20,303	$20,507	$22,892	$22,284
Misc. Exp.	$7,272	$7,790	$6,507	$2,946
Total Cash Expenses	$140,961	$175,979	$179,593	$234,147

Net Cash Farm Income	$101,480	$94,940	$88,806	$161,693
Inventory and Accounts Change	$502	$11,993	$29,244	$40,007
(-) Depreciation	$16,892	$30,675	$39,855	$64,182
Net Farm Income	$85,090	$76,258	$78,195	$137,518

Summary	1998	1999	2000	2001
Total Cash Income/Cwt. Sold	$20.25	$19.61	$16.54	$20.89
Total Cash Expenses/Cwt. Sold	$11.77	$12.74	$11.07	$12.36
Net Cash Margin/Cwt. Sold	$8.48	$6.87	$5.47	$8.53
Net Farm Income	$85,090	$76,258	$78,195	$137,518
Net Farm Income per Cow	$896	$675	$646	$935
Net Farm Income per Cwt.	$7.11	$5.52	$4.82	$7.26
Culling Rate (sold for beef)	7.37%	5.31%	17.36%	11.56%
Culling Rate (seasonal breeding)	5.26%	1.77%	3.31%	0.00%
Grain Costs per Cwt. Milk	$2.74	$3.48	$3.53	$3.92
Lbs. Milk Sold per Worker	704,204	767,428	901,345	947,462

WAYNE AND KAY CRAIG
NEW HOLSTEIN, WI

Wayne and Kay Craig began their seasonal dairy grazing operation in 1993 not far from the shores of Lake Michigan in eastern Wisconsin. The farm has 220 acres of openland, all of which is in permanent pasture. The land is gently rolling with predominantly silt loam soils. Wayne and Kay both work full-time on the farm and they hire part-time milking help.

The pastures contain a mix of bromegrass, quackgrass, red clover, ladino clover and alfalfa. The Craigs have a three-strand, high-tensile wire perimeter fence around the entire property. They use a single strand of high-tensile wire to create five to 10 acre paddocks that are then subdivided with polywire. Water is available to all the paddocks through one inch black poly pipe with hydrants every 150 feet. The main cow lanes to the paddocks are improved with limestone screenings over breaker rock. The cows are rotated to a fresh paddock every 12 hours and the young stock move every two days.

The Craigs use a 15-unit swing parlor for milking. With two people operating the parlor milking and clean-up takes about one hour and 40 minutes. In the heart of the winter (January through March) all of the animals are housed on a bedding pack in two pole barns open to the south. The Craigs started with 70 Holsteins in 1993, crossbreeding with Jersey and some Milking Shorthorn. In 2001, the herd consisted of approximately 100 cross-bred milk cows plus young stock. The herd average has been in the range of 15,000 to 16,000 pounds per cow from 1998 to 2001. The target calving window on the farm is from March 20th to May 31st with a dry-off date of February 1st. The Craigs use AI for the first heat and then rely on a clean-up bull. Their rate of first service conception has increased from 40 percent to 70 percent over the years. Herd health is very good, with virtually no feet and leg problems.

The Craigs supplement the pasture forage with 12 pounds of finely ground shell corn plus 10 pounds of corn silage split into two feedings per day after milking. During the grazing season (mid-April through October), the grain/silage mix is fed on the ground in the paddocks. During the winter and in very wet weather, feeding is done in bunks on a concrete holding area. The Craigs produce baleage and some dry hay on the farm. They purchase all of the grain and corn silage and some dry hay.

The Craigs have incorporated direct marketing into their farm operation as well. They sell grass based dairy beef, pastured poultry and free-range eggs. They are also charter members of the Wisconsin Dairy

Graziers Cooperative which markets grass-based cheese under the "Northern Meadows" label. They like the direct contact with consumers who are interested in quality farm products and care about how their food is produced.

The Craigs would not farm without the use of a seasonal grazing system. They feel strongly about the environmental benefits of reduced soil erosion and increased wildlife habitat on the farm. They feel that the seasonal calving schedule dramatically simplifies their day-to-day management; focusing on one task at a time. With this system they can also incorporate caring for their young son into the daily chores. On top of it all, "there is nothing like watching our cows grazing fresh grass after a long hard winter."

Financial Results

The Craig's herd size decreased by from 109 to 94 cows over the period 1998-2001. Numerous animals were lost in 1999 and 2000, which was likely due to a feed toxicity problem. Milk production per cow has ranged from 15,000 to 16,000 pounds, higher than many seasonal dairy grazing operations. Their labor efficiency in terms of milk shipped per worker is on par with the average for Wisconsin dairy farms. Farm profitability has been quite variable from 1998 to 2001. In 1998, net farm income per cow ($804) was slightly higher than the Wisconsin average ($716) but net farm income per cwt. ($5.27) was substantially higher than the state average ($3.54). In 1999 and 2000, net farm income per cow ($387 and $-16, respectively) were below the Wisconsin average ($578 and $296, respectively) as was net farm income per cwt. (1999: $2.48 vs. $2.86; 2000: $-0.10 vs. $1.44). In 2001, the Craig's profitability increased dramatically. Net farm income per cow and per cwt. ($842 and $5.59, respectively) were substantially higher than the Wisconsin state average ($520 and $2.52, respectively).

Wayne & Kay Craig
New Holstein, Wisconsin

Farm Statistics	1998	1999	2000	2001
System	Seasona	Seasonal	Seasonal	Seasonal
Farm Workers (Total FTE)	2.7	2.7	2.7	2.7
Average Cows in Milk	109	100	92	94
Cows Culled (sold for beef)	n/a	24	17	12
Cows Culled (seasonal calving)	n/a	16	14	5
Lbs. Milk Sold/Cow	15,262	15,616	15,956	15,077
Total Lbs. Milk Sold	1,663,599	1,561,631	1,467,976	1,417,273
Avgerage Milk Price	$15.66	$15.66	$12.94	$16.27
Total Crop/Pasture Acres	220	220	220	220

Cash Income				
Total Value Milk Sold	$260,464	$244,535	$189,927	$230,639
Cull Cow & Calf Sales	$15,773	$31,527	$32,512	$35,955
Crop Sales	$0	$0	$0	$0
Other Farm Income	$24,528	$20,165	$18,120	$10,415
Total Cash Income	$300,765	$296,227	$240,559	$277,009

Cash Expenses				
Marketing and Hauling	$5,659	$6,126	$4,834	$3,784
Purchased Feed: Forage ($)	$36,494	$19,560	$0	$14,759
Purchased Feed: Grain ($)	$42,346	$42,371	$30,255	$39,940
Vet/Medicine/Hoof trimming	$7,631	$10,727	$10,393	$8,208
Breeding	$2,188	$2,308	$2,402	$2,625
Labor (paid)	$10,604	$27,346	$2,860	$7,475
DHIA	$0	$0	$0	$0
Custom/Machine Hire	$6,960	$9,227	$6,938	$10,827
Fertilizer/Lime/Chemical	$5,940	$6,232	$881	$0
Seed	$5,598	$4,055	$480	$3,162
Repairs	$27,479	$14,713	$14,085	$20,500
Fuel	$2,050	$2,353	$2,170	$2,889
Supplies	$22,469	$16,839	$16,136	$26,585
Utilities	$3,247	$4,373	$4,263	$4,609
Rent	$15,399	$19,583	$17,130	$13,069
Taxes (property)	$6,680	$963	$5,133	$2,061
Insurance	$1,471	$1,753	$1,862	$2,776
Farm Interest	$21,208	$21,114	$30,174	$4,420
Misc. Exp.	$6,192	$4,684	$6,675	$9,156
Total Cash Expenses	$229,615	$214,327	$156,671	$176,845

Net Cash Farm Income	$71,150	$81,900	$83,888	$100,164
Inventory and Accounts Change	$38,537	$7,747	-$33,185	$25,476
(-) Depreciation	$22,000	$50,936	$52,200	$46,457
Net Farm Income	$87,687	$38,711	($1,497)	$79,183

Summary	1998	1999	2000	2001
Total Cash Income/Cwt. Sold	$18.08	$18.97	$16.39	$19.55
Total Cash Expenses/Cwt. Sold	$13.80	$13.72	$10.67	$12.48
Net Cash Margin/Cwt. Sold	$4.28	$5.24	$5.71	$7.07
Net Farm Income	$87,687	$38,711	($1,497)	$79,183
Net Farm Income per Cow	$804	$387	($16)	$842
Net Farm Income per Cwt.	$5.27	$2.48	($0.10)	$5.59
Culling Rate (sold for beef)	n/a	24.00%	18.48%	12.77%
Culling Rate (seasonal breeding)	n/a	16.00%	15.22%	5.32%
Grain Costs per Cwt. Milk	$2.55	$2.71	$2.06	$2.82
Lbs. Milk Sold per Worker	616,148	578,382	543,695	524,916

HOWARD AND MARY JO STRAUB
TRIPLE H FARMS, ST. JOHNS, MICHIGAN

Howard and Mary Jo Straub have been farming at their present location in St. Johns, Michigan since 1972. The farm is 260 acres of flat ground and gently rolling hills with heavy clay loam soils. An additional 14 acres is rented for extra hay. Howard and Mary Jo have recently been joined by their daughter, Terri, who works on the farm full-time.

The Straubs ran a confinement operation until 1994 when they started using management-intensive grazing. After four years of transition to seasonal calving, the first complete dry off and shut down of the milking parlor occurred in early 1999. Their herd, which was once all Holsteins, is now predominantly Holstein-Jersey crosses. The trend toward an all Jersey herd is likely to continue in order to take advantage of multiple component pricing.

The entire herd is bred to calve in a window between April 5 and May 15 of each year. All animals are dried off by February 10. In 1998, the Straubs milked 95 cows, but reduced herd size to 86 cows in 1999. In 2001 herd size was up to 97 animals with plans for future expansion into the 100+ cows range. All replacement animals are raised on the farm. Breeding has been with natural service, but the family plans to begin using AI to increase the genetic potential of the herd.

The pastures at Triple H Farms are made up of orchard grass, clover, perennial ryegrass, trefoil and timothy. The Straubs use a three-strand, high-tensile perimeter fence with a single strand wire to subdivide the interior into five acre paddocks. Each five acre paddock is then broken into smaller field units that vary in size depending on the needs of the herd.

The milking herd gets 100 percent of its forage from pasture from mid-April through mid-October. Excess pasture forage and 14 acres of hay provide winter feed during the non-grazing months. In 1999, the Straubs started using a custom baling service rather than replace their old haying equipment. They have also sold or leased out all of their former machinery for row crop production. So far, they are very pleased with the results of this arrangement. They feel that the true cost of owning a full line of machinery is not justified for their operation.

Corn is fed prior to milking at the rate of eight pounds per cow per day to provide energy. The cows receive no grain during the dry period. The Straubs converted their double-six parlor with 12 units to a double-10 swing parlor with automatic takeoffs in early 2000. One person is now able to milk up to 60 cows per hour. The dry cows and young stock are outwintered, which has worked very well. These animals have access to the free-stall barn, but rarely use it.

The Straubs have found that seasonal calving gives them more family time and provides an opportunity each year to make adjustments and repairs to the milking facilities. They have also found it interesting to see profits increase as milk production per cow decreased during their transition from confinement to spring calving with grazing. Another advantage that they have noticed is healthier calves, a benefit they attribute to the calf facilities being empty for 10 months of the year.

Financial Results

The Straubs have generally been selling 12,000 to 13,000 pounds of milk per cow since becoming seasonal. However, in 2001 they sold under 10,000 pounds per cow due to a hot and dry summer and more jersey crosses in the herd. The average Michigan dairy farm in 2001 had approximately 188 cows producing almost 20,000 pounds per cow (Nott, 2002). The Straub's true culling rate (defined as the percentage of the milking herd sold for beef) has been as high as 20 percent and as low as 11 percent. Sound cows that do not breed back in their calving window are sold to other farms as breeding stock, averaging more than $800 per animal.

In the years 1998 to 2000, the Straub's net farm income per cow was less than that of the average Michigan dairy farm. It must be noted that the production level per cow is 50 percent to 100 percent higher on the average farm than on this seasonal grazing operation. In 2001, their net farm income per cow was $75 greater than the average ($873 vs. $797). In all the years of this study, 1998 to 2001, the Straub's net farm income per cwt. of milk sold was at least as great as the average for the state. In 2001, the Straub's net farm income per cwt. of milk sold was more than 100 percent greater than the state average ($8.83 vs. $4.00- Nott, 2002).

Some important contributors to the financial success of this operation are the very low grain costs per cwt. of milk sold, very low veterinary expenses, low breeding and fuel costs, low culling rates and very high labor efficiency that makes it possible to sell almost 800,000 pounds of milk per worker each year.

Howard and Mary Jo Straub
Triple H Farms, St. Johns, Michigan

Farm Statistics	1998	1999	2000	2001
System	Seasonal	Seasonal	Seasonal	Seasonal
Farm Workers (Total FTE)	1.5	1.5	1.5	2
Average Cows in Milk	95	86	96	97
Cows Culled (sold for beef)	10	15	18	17
Cows Culled (seasonal calving)	10	20	0	11
Avg. Lactation Length (Days)	315	315	315	315
Lbs. Milk Sold/Cow	13,242	12,745	12,364	9,879
Total Lbs. Milk Sold	1,257,999	1,096,070	1,186,896	958,243
Avgerage Milk Price	$15.27	$14.00	$13.64	$17.04
Total Crop/Pasture Acres	250	250	250	250

Cash Income	Per Cow	Total	Per Cow	Total	Per Cow	Total	Per Cow	Total
Total Value Milk Sold	$2,022	$192,119	$1,785	$153,481	$1,687	$161,944	$1,701	$163,316
Cull Cow & Calf Sales	$78	$7,366	$185	$15,883	$113	$10,827	$293	$28,107
Crop Sales	$141	$13,431	$0	$0	$1	$140	$0	$0
Other Farm Income	$89	$8,477	$205	$17,667	$222	$21,336	$75	$7,243
Total Cash Income	$2,330	**$221,393**	$2,175	**$187,031**	$2,023	**$194,247**	$2,069	**$198,666**

Cash Expenses	Per cow	Total	Per Cow	Total	Per cow	Total	Per cow	Total
Marketing and Hauling	$93	$8,836	$82	$7,080	$79	$7,611	$78	$7,504
Purchased Feed: Forage ($)	$111	$10,576	$16	$1,400	$0	$0	$0	$0
Purchased Feed: Grain ($)	$186	$17,643	$210	$18,045	$211	$20,240	$167	$16,016
Vet/Medicine/Hoof trimming	$15	$1,392	$12	$995	$10	$929	$12	$1,155
Breeding	$0	$0	$0	$0	$2	$200	$6	$621
Labor (paid)	$131	$12,449	$218	$18,709	$369	$35,425	$374	$35,861
DHIA	$0	$0	$0	$0	$0	$0	$0	$0
Custom/Machine Hire	$13	$1,264	$127	$10,909	$99	$9,501	$91	$8,760
Fertilizer/Lime/Chemical	$34	$3,193	$27	$2,280	$0	$0	$0	$0
Seed	$15	$1,411	$12	$1,008	$10	$917	$0	$0
Repairs (incl. car & truck expenses)	$167	$15,853	$173	$14,885	$86	$8,223	$157	$15,038
Fuel	$22	$2,074	$49	$4,176	$51	$4,858	$30	$2,912
Supplies	$48	$4,577	$60	$5,192	$42	$4,029	$73	$6,984
Utilities	$45	$4,253	$44	$3,815	$40	$3,803	$41	$3,895
Rent	$99	$9,441	$95	$8,183	$71	$6,838	$0	$0
Taxes (property)	$41	$3,873	$50	$4,319	$45	$4,319	$48	$4,632
Insurance	$34	$3,194	$47	$4,060	$29	$2,825	$27	$2,551
Interest	$263	$25,013	$266	$22,868	$225	$21,615	$196	$18,802
Miscellaneous Expenses	$16	$1,522	$30	$2,539	$22	$2,127	$69	$6,595
Total Cash Expenses	$1,332	**$126,564**	$1,517	**$130,463**	$1,390	**$133,460**	$1,368	**$131,326**

Net Cash Farm Income	$998	**$94,829**	$658	**$56,568**	$633	**$60,787**	$701	**$67,340**
Inventory Change	($187)	($17,808)	$110	$9,495	$103	$9,876	$213	$20,450
(-)Depreciation and Capital Adjustments	$160	$15,191	$61	$5,222	$340	$32,683	$33	$3,144
Net Farm Income	$651	**$61,830**	$707	**$60,841**	$396	**$37,980**	$882	**$84,646**

Summary	1998	1999	2000	2001
Total Cash Income/Cwt. Sold	$17.60	$17.06	$16.37	$20.73
Total Cash Expenses/Cwt. Sold	$10.06	$11.90	$11.24	$13.70
Net Cash Margin/Cwt. Sold	$7.54	$5.16	$5.12	$7.03
Net Farm Income	$61,830	$60,841	$37,980	$84,646
Net Farm Income per Cow	$651	$707	$396	$873
Net Farm Income per cwt.	$4.91	$5.55	$3.20	$8.83
Culling Rate (sold for beef)	10.53%	17.44%	18.75%	17.53%
Culling Rate (dairy, out of calving window)	10.53%	23.26%	0.00%	11.34%
Grain Costs per Cwt. Milk	$1.40	$1.65	$1.71	$1.67
Lbs. Milk Sold per Worker	838,666	730,713	791,264	479,122

FORREST STRICKER
WERNERSVILLE, PENNSYLVANIA

Forrest Stricker and his family farm 275 acres in Wernersville, Pennsylvania, about 65 miles northwest of Philadelphia. The farm has been in Forrest's family for four generations. The terrain is hilly and the soils are mostly Berks shale, which is a well-drained and moderately productive soil. In addition to Forrest, the farm has one full-time and one part-time employee. Forrest's father and his two teenage sons also help out when needed.

Prior to 1993, the Strickers had a conventional, confinement feeding operation averaging 20,600 pounds of milk from 57 cows. From 1993 to 1996, they used management-intensive grazing to average 18,400 pounds of milk from 67 cows. From 1997 through 1999, they averaged 15,500 pounds per cow as a seasonal grass-based dairy farm. In 2000, the Strickers became a certified organic dairy. With this change, milk production dropped to the range of 13,000 pounds per cow. As organic dairy producers, the Strickers have had their most and least profitable years in 2000 and 2001, respectively.

In 2000, the Strickers completed construction of a New Zealand-style, 16-unit swing parlor with plans to continue increasing the herd size in the coming years. Prior to building the new parlor, milking was done in tie-stalls with a pipeline. It took two people approximately two and 1/4 hours to milk 70 cows and clean-up. With the new parlor, one person can milk 75 cows per hour.

Ten to 12 pounds of dry shelled corn is fed to each cow just before milking. Calves up to six or seven months get three to four pounds of grain daily. Dry cows and heifers get only hay and pasture. One of the lessons learned by the Strickers was the importance of not overfeeding grain. They found that feeding too much grain to grazing cows results in sore feet, low fat tests and reduced profitability.

The Stricker herd is all Holstein with about 20 percent of the animals registered. They raise all of their replacement heifers on the farm. Their calving window is from March 1 to April 30. They use AI on all the cows for first service then bring in a clean-up bull.

The Strickers extend the grazing season and keep animals out on pasture for 12 months of the year by stockpiling tall fescue and other pasture forages. The animals also receive balage and dry round bales during the winter. The heifers are housed outside through the winter (outwintered) as are the milkers once

they have been dried off. The perimeter fencing is one strand of 16-gauge high-tensile wire and the paddocks are subdivided with poly-wire. Water is pumped into every paddock with one inch plastic pipe. The cows get a fresh paddock after every milking and the heifers and dry cows are moved once a day. Some of the other lessons learned by the Strickers have been: 1) the importance of keeping capital investment in machinery, equipment and buildings to a minimum; 2) that it is difficult to transition a herd of North American Holsteins to spring seasonal calving; 3) it is necessary to keep adequate mineral levels in the ration; 4) the value of stockpiling fescue for early spring grazing; and 5) that seasonal milking allows for much more family time.

Financial Results

The Strickers' financial performance has been highly variable over the years of this study. In 1998, they had more than twice the Pennsylvania average net farm income per cow ($730 vs. $335) and per cwt. ($4.67 vs. $1.81) (Greaser and Parsons, 1999). In 1999, their profitability was below average on a per cow ($337 vs. $464) and per cwt. basis ($2.19 vs. $2.53) (Greaser et al., 2000). As their primary transition year to organic production, they incurred the costs of being organic in 1999 without receiving the milk price premium. The Strickers' best year in absolute and relative terms was 2000, a year with low conventional milk prices. An increased herd size (from 70 to 90 milkers), a new parlor and the organic price premium all contributed to performance that was six times greater than the average on a per cow basis ($1,229 vs. $193) and 9 times greater on a per cwt. basis ($9.53 vs. $1.02) (Roth and Hyde, 2001). An increased grain bill, greatly reduced crop inventories due to dry weather and a slightly lower organic milk price dramatically reduced profits in 2001 to well below the state average on a per cow ($87 vs. $467) and per cwt. basis ($0.65 vs. $2.41) (Pennsylvania Farm Bureau, 2002).

The Strickers are able to produce organic milk at a relatively low cost through the production of high-quality pasture forage and the use of seasonal calving. Good management and a flexible production system, combined with organic price premiums, should allow the Strickers to be profitable well into the future.

Forrest Stricker
Wernersville, Pennsylvania

Farm Statistics	1997	1998	1999	2000	2001
System	Seasonal	Seasonal	Seasonal	Organic	Organic
Farm Workers (Total FTE)	2.5	2.5	2.5	2.3	2.3
Average Cows in Milk	60	70	70	90	90
Cows Culled (sold for beef)	34	19	17	21	18
Cows Culled (seasonal calving)	8	9	7	0	8
Lbs. Milk Sold/Cow	15,493	15,632	15,389	12,900	13,300
Total Lbs. Milk Sold	929,587	1,094,265	1,077,225	1,161,022	1,197,000
Avgerage Milk Price	$13.64	$14.93	$16.23	$20.83	$19.75
Total Crop/Pasture Acres	260	260	260	260	260

Cash Income					
Total Value Milk Sold	$126,806	$163,365	$174,809	$241,809	$236,423
Cull Cow & Calf Sales	$20,333	$20,279	$13,317	$13,282	$28,742
Crop Sales	$2,032	$3,626	$10,702	$274	$0
Other Farm Income	$4,195	$7,776	$10,150	$38,766	$10,600
Total Cash Income	$153,366	$195,046	$208,978	$294,131	$275,765

Cash Expenses					
Marketing and Hauling	$4,478	$4,696	$9,094	$1,916	$1,300
Purchased Feed: Forage ($)	$0	$0	$0	$0	$0
Purchased Feed: Grain ($)	$26,006	$20,929	$30,931	$46,373	$57,152
Vet/Medicine/Hoof trimming	$3,570	$2,912	$3,990	$1,764	$1,843
Breeding	$1,705	$1,915	$2,549	$3,064	$496
Labor (paid)	$20,116	$30,834	$38,986	$37,330	$32,806
DHIA	$1,187	$1,426	$1,165	$0	$0
Custom/Machine Hire	$2,870	$1,556	$933	$3,015	$4,573
Fertilizer/Lime/Chemical	$5,875	$5,742	$9,640	$2,017	$9,236
Seed	$2,217	$1,292	$5,034	$10,274	$3,756
Repairs	$16,776	$8,968	$16,268	$10,827	$23,427
Fuel	$2,726	$3,188	$3,705	$4,138	$5,643
Supplies	$6,577	$4,581	$6,812	$9,508	$11,516
Utilities	$5,228	$6,301	$5,899	$8,475	$6,846
Rent	$8,100	$660	$147	$772	$170
Taxes (property)	$4,557	$10,424	$9,114	$6,238	$6,859
Insurance	$3,584	$4,813	$4,838	$5,365	$6,180
Farm Interest	$0	$15,049	$16,218	$17,773	$18,720
Misc. Exp.	$6,860	$4,729	$4,922	$1,928	$10,226
Total Cash Expenses	$122,432	$130,015	$170,245	$170,777	$200,749

Net Cash Farm Income	$30,934	$65,031	$38,733	$123,354	$75,016
Inventory Change	-$600	$1,163	$0	$11,790	-$57,730
Depreciation	$15,116	$15,116	$15,116	$24,516	$9,469
Net Farm Income	$15,218	$51,078	$23,617	$110,628	$7,817

Summary	1997	1998	1999	2000	2001
Total Cash Income/Cwt. Sold	$16.50	$17.82	$19.40	$25.33	$23.04
Total Cash Expenses/Cwt. Sold	$13.17	$11.88	$15.80	$14.71	$16.77
Net Cash Margin/Cwt. Sold	$3.33	$5.94	$3.60	$10.62	$6.27
Net Farm Income	$15,218	$51,078	$23,617	$110,628	$7,817
Net Farm Income per Cow	$254	$730	$337	$1,229	$87
Net Farm Income per cwt.	$1.64	$4.67	$2.19	$9.53	$0.65
Culling Rate (sold for beef)	56.67%	27.14%	24.29%	23.33%	20.00%
Culling Rate (seasonal breeding)	13.33%	12.86%	10.00%	0.00%	8.89%
Grain Costs per Cwt. Milk	$2.80	$1.91	$2.87	$3.99	$4.77
Lbs. Milk Sold per Worker	371,835	437,706	430,890	509,220	525,000

GLENN AND EVELYN MOYER
COVE MOUNTAIN FARM, MERCERSBURG, PENNSYLVANIA

Cove Mountain Farm (CMF) is located in Franklin County, Pennsylvania, 100 miles northwest of Washington, DC, three miles north of the Maryland state line. The property is owned by American Farmland Trust (AFT) and leased by Glenn and Evelyn Moyer, who operate Cove Mt. Farm as a seasonal, grass-based dairy. A cooperative agreement between AFT and the Moyers makes it possible for CMF to be used as a demonstration site to educate farmers and landowners about the economic and environmental benefits of grass-based livestock management systems.

The farm consists of 330 acres of rolling hills with about 200 acres of pasture. After assuming ownership of the farm in 1996, AFT spent roughly $325,000 to build the necessary infrastructure for a state-of-the-art dairy grazing operation (a detailed report on the costs of this development can be viewed on the internet at http://grassfarmer.com/Cove Mt. Farm/Cove Mt. Farmdev.html). The farm now has a New Zealand-style milking parlor a series of improved cattle lanes, livestock watering units in every paddock and is completely fenced with high-tensile electric fencing.

The Moyers began milking at CMF in March 1998. The milking facility is a 18-unit (two units added in 2000), New Zealand-style, swing parlor which allows one operator to milk up to 100 cows per hour, maximizing the amount of time that the animals are out on pasture.

The milking herd is composed mainly of Holstein/Jersey crosses, however heifers with Dutch Belted, Milking Shorthorn and Normandy blood have also been introduced. Breeding is done by A.I. and some natural service. The Moyer's target calving window is from March 1 to April 15, with the entire milking herd dried off by mid-January. The dry cows are housed outside during the winter (outwintered) utilizing natural sheltered areas on the farm. This seasonal milking schedule allows the Moyers to increase their labor efficiency.

Many of the animals born at CMF are sold to a separate operation owned by the Moyers, raised on a runoff farm for calves and young stock, and then sold back to CMF as bred replacement heifers. While this arrangement is not typical of most grass-based operations, it has reduced grazing pressure at CMF and allowed the operation to focus on improving pastures for milk production.

Most of the pastures at CMF are former hay fields containing a mix of orchard grass, bluegrass and white clover, with a number of fields dominated by tall fescue. Approximately 50 acres of heavy fescue was killed and replanted to perennial ryegrass and white clover in 2000. Pastures vary greatly in topography and soil types, ranging from wet, riparian soils to very thin upland soils.

The perimeter fence consists of two-strands of aluminum coated, high-tensile, 12-gauge steel wire. The internal fencing is one strand of 16-gauge high-tensile steel wire or poly-wire set on moveable fiberglass posts. Fences are energized with two high-intensity chargers (one 110 volt and one 220 volt). Almost two miles of improved 12 foot wide cattle lanes have been built in order to minimize the cow's energy expenditure and avoid hoof problems in the herd. All of the main paddocks are supplied with fresh drinking water piped through black plastic water line from two wells on the property.

Productivity and Financial Performance

Herd Size and Milk Production

In 1998, the Moyers milked 84 cows, producing an average of 10,738 pounds per cow. In 1999, herd size increased to 99 cows, but milk production per cow decreased to 9,753 pounds due to the dry conditions. In 2000, the average herd size was increased to 118 cows and milk production rebounded slightly to 10,170 pounds per cow. The year 2001 was an excellent year for Cove Mountain Farm; the herd size was increased to 153 cows averaging 12,046 pounds of milk per head. CMF has reached a stocking density of 0.75 cows per acre, which is two to three times greater than the average Pennsylvania dairy farm.

The milk production at CMF is far below the average for the industry. This is due to several factors. Although the minor breed genetics is prevalent through the herd, the focus of this system in not on achieving high levels of milk production per cow. The focus of this system is decreased costs through inexpensive pasture forage and increased labor efficiency.

Labor and Feed Efficiency

Grain costs per cwt. of milk sold at CMF have increased gradually from $3.37 in 1998 to $4.11 in 2001. Yearly variation in feed prices will affect this figure, which continues to be very close to the average for Pennsylvania dairy farms (Greaser and Parsons, 1999; Greaser et al., 2000; Roth and Hyde, 2001; Pennsylvania Farm Bureau, 2002).

Labor efficiency, as measured by milk sold per full-time equivalent (FTE) worker, has increased to over 1 million pounds at CMF. This is 25 percent higher than the average for Pennsylvania dairy farms despite the dramatically lower per cow production level (Pennsylvania Farm Bureau, 2002). This performance is driven by the fact that the CMF operation handles approximately twice as many cows per FTE worker than the average Pennsylvania dairy farm (Pennsylvania Farm Bureau, 2002). This is possible due to the lack of daily barn chores (i.e. feeding and cleaning) and the efficiency of the 18-unit swing parlor. The labor efficiency associated with this production system is integral to Cove Mountain Farm's profitability.

Profitability

Cove Mountain Farm's financial performance continues to outpace the average for Pennsylvania by a wide margin. Measured by net farm income per cwt. of milk sold, CMF profitability ranged from two to five times greater than the average for Pennsylvania dairy farms from 1998 through 2001 (Pennsylvania Farm Bureau, 2002; Roth and Hyde, 2001; Greaser et al., 2000; Greaser and Parsons, 1999). In 2001, CMF net farm income per cow was equal to the average of the top 10 percent of farms in the state; the net farm income per cwt. was 67 percent greater than the average of the top 10 percent (Pennsylvania Farm Bureau, 2002).

In addition to the high labor efficiency (reduced labor costs), veterinary and medicine costs at CMF are approximately 20 percent to 25 percent of the Pennsylvania average. Although this could be interpreted as substandard attention to herd health, the low culling rate at CMF (from 9 percent to 20 percent) suggests that this is not the case and that herd health is generally excellent on the farm. The low culling rate also translates into higher farm profits through lower replacement costs and/or higher revenue from heifer sales. Cropping-related expenses are also much lower than the Pennsylvania average. Expenses for fertilizer and lime are roughly one-third of the average level; there are no expenses for crop chemicals. In addition to the cost-savings, reducing the use of these inputs is good for the environment.

The dairy industry remains focused on increasing per cow milk production levels as a means to increase farm profitability. Although milk sales are the predominant source of revenue for dairy farms, the results at CMF clearly show that it is not necessary to have maximum (or even high) milk production per cow to be profitable. The difference is that the seasonal dairy grazing system is designed to achieve profitability through low operating expenses and high labor efficiency. Higher profit margins allow producers the ability to operate at lower per cow milk production levels and to be competitive at lower milk prices.

Glenn and Evelyn Moyer

Cove Mrt. Farm, Mercersburg, Pennsylvania

Farm Statistics	1998	1999	2000	2001
Farm Workers (Total FTE)[1]	1.1	1.3	1.3	1.8
Average Cows in Milk	84	99	118	153
Cows Culled (sold for beef)	8	9	19	31
Cows Culled (sold as dairy animals)	9	27	27	0
Lbs. Milk Sold/Cow	10,738	9,753	10,170	12,046
Total Lbs. Milk Sold	901,991	967,521	1,200,098	1,843,074
Average Milk Price	$16.28	$15.81	$14.43	$18.60
Total Crop/Pasture Acres	200	200	200	200

Cash Income	*Total*	*per cow*	*Total*	*per cow*	*Total*	*per cow*	*Total*	*per cow*
Total Value Milk Sold	$146,820	$1,748	$153,000	$1,545	$172,006	$1,458	$342,812	$2,241
Livestock Sales[2]	$26,785	$319	$52,969	$535	$26,965	$229	$50,161	$328
Bull Calf Sales	$863	$10	$1,212	$12	$2,634	$22	$4,523	$30
Crop Sales	$1,400	$17	$0	$0	$0	$0	$0	$0
Other Farm Income	$0	$0	$6,545	$66	$8,968	$76	$10,352	$68
Total Cash Income	**$175,868**	**$2,094**	**$213,726**	**$2,159**	**$210,573**	**$1,785**	**$407,848**	**$2,666**

Cash Expenses	*Total*	*per cow*	*Total*	*per cow*	*Total*	*per cow*	*Total*	*per cow*
Marketing and Hauling	$10,645	$127	$11,914	$120	$12,874	$109	$19,402	$127
Purchased Feed: Forage ($)	$11,013	$131	$10,019	$101	$11,827	$100	$7,278	$48
Purchased Feed: Grain ($)	$30,429	$362	$34,506	$349	$43,374	$368	$75,796	$495
Vet/Medicine/Hoof trimming	$1,553	$18	$2,002	$20	$3,718	$32	$3,246	$21
Breeding[3]	$375	$4	$2,420	$24	$2,913	$25	$4,992	$33
Labor (paid)	$490	$6	$12,595	$127	$15,543	$132	$20,157	$132
Custom/Machine Hire	$795	$9	$3,905	$39	$150	$1	$2,090	$14
Fertilizer/Lime/Chemical	$2,730	$33	$4,037	$41	$1,527	$13	$7,001	$46
Seed	$1,091	$13	$155	$2	$88	$1	$1,817	$12
Repairs (incl. car & truck expenses)	$2,399	$29	$4,408	$45	$5,891	$50	$6,446	$42
Fuel	$2,625	$31	$4,910	$0	$4,823	$41	$4,982	$33
Supplies	$5,782	$69	$6,477	$65	$6,399	$54	$5,155	$34
Utilities	$2,734	$33	$3,768	$38	$3,817	$32	$5,240	$34
Rent: real estate lease[4]	$16,000	$190	$21,800	$220	$23,550	$200	$27,000	$176
Rent: cattle lease[5]	$18,660	$222	$13,023	$132	$6,612	$56	$1,293	$8
Insurance	$430	$5	$1,451	$15	$1,384	$12	$3,437	$22
Interest	$1,687	$20	$753	$8	$2,340	$20	$208	$1
Misc. expenses	$358	$4	$389	$4	$892	$8	$979	$6
Total Cash Expenses	**$109,797**	**$1,307**	**$138,532**	**$1,350**	**$147,722**	**$1,252**	**$196,519**	**$1,284**

Totals and Adjustments	*Total*	*per cow*	*Total*	*per cow*	*Total*	*per cow*	*Total*	*per cow*
Net Cash Income	$66,072	$787	$75,194	$760	$62,851	$533	$211,329	$1,381
Accrual adjustments								
Accounts receivable	$11,711	$139	($3,651)	($37)	$1,015	$9	$5,929	$39
Inventory Change	($7,230)	($86)	$3,795	$38	$25,638	$217	($8,641)	-$56
Depreciation[6]	($2,259)	($27)	($15,948)	($161)	($26,459)	($224)	($43,518)	($284)
Net Farm Income[7]	**$68,294**	**$813**	**$59,390**	**$600**	**$63,045**	**$534**	**$165,099**	**$1,079**

Summary	1998	1999	2000	2001
Total Cash Income/Cwt. Sold	$19.50	$22.09	$22.09	$22.13
Total Cash Expenses/Cwt. Sold	$12.17	$14.32	$14.32	$10.66
Net Cash Margin/Cwt. Sold	$7.33	$7.77	$7.77	$11.47
Net Farm Income	$68,294	$59,390	$63,045	$165,099
Net Farm Income per Cow	$813	$600	$534	$1,079
Net Farm Income per Cwt. Sold	$7.57	$6.14	$5.25	$8.96
Culling Rate (sold for beef)	9.52%	9.09%	16.10%	20.26%
Culling Rate (incl seasonal breeding)	20.24%	36.36%	38.98%	20.26%
Grain Costs per Cwt. Milk	$3.37	$3.57	$3.61	$4.11
Lbs. Milk Sold per Worker	819,992	744,247	923,152	1,023,930

Footnotes

1) Farm Workers (Total FTE)- In 98, 1.1 FTE included Moyer and some family labor. In 99 and 00, 1.3 FTE was a hired man (.66 FTE) and Moyer (.66). In 2001, 1.8 FTE was a hired man (1.0 FTE) and Moyer (.8 FTE).

2) Livestock Sales- In some years, Cove Mt. Farm does not raise replacements. Viable dairy animals that don't fit into the seasonal breeding window may be sold to other dairy herds. This line reflects the total income for the sale of cull cows, female calves, dairy heifers and viable dairy cows.

3) Breeding- In 1998, breeding was done with a bull. In 99-01, A.I. was used with a cleanup bull late in the season.

4) Rent: Real estate- Cove Mt. is leased to Moyer.

5) Rent: Cattle lease- The herd brought to Cove Mt. Farm in 1998 was leased. In successive years the number of leased animals will decline as replacements are purchased.

6) Depreciation- Amount calculated on all machinery, equipment and livestock. Owned livestock are depreciated over a 5-year period.

7) Net Farm Income- Defined as the amount left after expenses and accrual adjustments for taxes, family living and to service debt principal.

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