

# Organic Dairying- Can It Work For You?

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## ■ Take Home Message

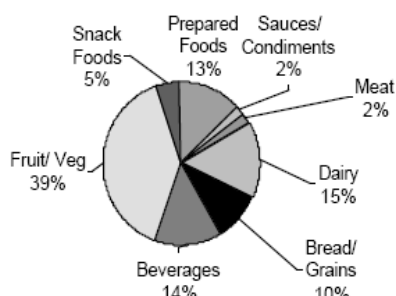
- The demand for organic dairy products continues to increase and outstrip supply, creating a favorable pricing strategy for producers. Demand is such that processors are paying significant “signing” and “transition” bonuses.
- Organic milk prices that are paid to producers in the US provide stability not witnessed in conventional dairy systems.
- Most organic dairy farmers in the Northeast US transitioned to organic production to try and improve profitability.
- Despite high premiums paid to producers for organic milk, transitioning to organic production does not ensure profitability. However, good management can pay significant rewards.
- Despite the loss of antibiotics, milk quality produced on organic farms in the Northeast is of high quality. Premiums for quality milk are significantly higher in the organic marketplace.
- Cost, quality and consistency of organic grains are major issues in organic livestock production.
- Organic dairy farms have switched from the conventional paradigm of maximum milk per cow to a strategy that focuses on a balance of production, animal health, longevity and maximum use of forage and pasture.
- Clarification of pasture and heifer rules in the US may dictate what organic farms will look like in the future.

## ■ Introduction

The current market for organic dairy products has grown by over 15% per year (OTA, 2006). In the Northeast region of the United States, organic dairy production has become one of the fastest growing sectors in agriculture.

Organic dairy sales reached \$2.14 billion in 2005 and represented 15% of total organic retail food sales (OTA, 2006). Today, in the US, prices for organic milk are double the conventional prices, both at the wholesale and retail level. In the Northeast, producers are currently receiving between \$0.60-0.65 per kg. Since organic milk is a highly differentiated product and in high demand, the market can command a significantly higher price. Other components of the organic dairy market that are attractive for producers in the United States include a stable contracted price, with little or no transportation fees.

| Organic Food Categories              | Sales (\$Mil) | % Growth 2005 |
|--------------------------------------|---------------|---------------|
| Dairy                                | 2,140         | 23.6%         |
| Bread & Grains                       | 1,360         | 19.2%         |
| Beverages (incl. non-dairy)          | 1,940         | 13.2%         |
| Fruit & Vegetables                   | 5,369         | 10.9%         |
| Snack Foods                          | 667           | 18.3%         |
| Packaged/Prepared Foods              | 1,758         | 19.4%         |
| Sauces/Condiments                    | 341           | 24.2%         |
| Meat/Fish/Poultry                    | 256           | 55.4%         |
| <b>Total Org Consumer Food Sales</b> | <b>13,831</b> | <b>16.2%</b>  |



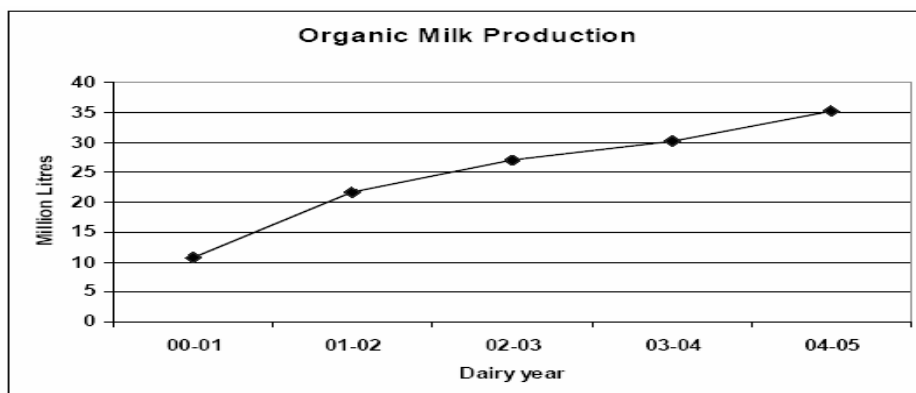
Source: OTA's 2006 Manufacturer Survey

**Figure 1. Organic Food Category Share, 2005**

The number of certified organic dairy cattle in the United States has grown significantly in the last 10 years, from 48,677 dairy cattle in 2001 to 86,032 (about 1% of the U.S. dairy herd) in 2005 (ERS, 2006). In 2002, the USDA implemented a National Organic Program (NOP) that set federal standards for organic production. These standards have come under significant comment and controversy but were seen as a method to increase consumer confidence in organic products and processing. Currently there are about 53 organic certification organizations, including 19 state programs that conduct third party certification of organic production and processing (ERS, 2006). In Canada, the Canadian General Standards Board has issued similar guidelines for the regulation of the organic market. CAN/CGSB-32.310-2006 and CAN/CGSB-32.311-2006 (revised and released in 2006) provide organic producers with general principles and management standards for organic production as well as a list of permitted substances. While many of the standards and allowed substances are similar between the two countries' certification programs, the author recommends Canadian producers examine the standards closely before considering transition. Specific Canadian standards can be found at:

[http://www.pwgsc.gc.ca/cgsb/on\\_the\\_net/organic/032\\_0310\\_2006-e.pdf](http://www.pwgsc.gc.ca/cgsb/on_the_net/organic/032_0310_2006-e.pdf) and  
[http://www.pwgsc.gc.ca/cgsb/on\\_the\\_net/organic/032\\_0311\\_2006-e.pdf](http://www.pwgsc.gc.ca/cgsb/on_the_net/organic/032_0311_2006-e.pdf)

Organic dairy production by volume in 2004-2005, was concentrated in Quebec (53%), Ontario (29%) and British Columbia (18%). Between 2004 and 2005, overall production increased by 17%. Estimates put production at about 35 million litres in 2004-2005 with 70 herds. Estimates for 2005-2006 indicate a significant increase in herds, which is to be expected as there are a large number of farms reported to be in transition (Macey, 2006).



From: Certified Organic Production in Canada 2005

[http://www.cog.ca/documents/certifiedorganicproduction05E\\_000.pdf](http://www.cog.ca/documents/certifiedorganicproduction05E_000.pdf)

**Figure 2. Organic Milk Production in Canada 2000-2005**

## ■ Cost of Producing Organic Milk

Organic dairy production practices include several significant differences from conventional production that increase the cost of producing organic milk. Standards include feeding 100% organically produced feed (forage and concentrate) and access and use of pasture during the growing season. Other commonly used production tools are not allowed in organic systems, including the use of antibiotics and hormones such as those used in synchronization of estrous in cows and heifers. Currently all vaccines are allowed. Once a herd has transitioned all heifers and young stock on the farm must be raised organically from the last third of gestation.

A major stumbling block for many producers who are considering organic production is the transition period for the land and animals. For cropland, pesticides and inorganic fertilizers cannot be used for 36 months prior to certification. Transitioning a herd of cows requires that the animals on the farm be managed organically for 12 months before the milk is considered

organic. This transition process for cows and heifers can be costly as organic feed costs are significantly higher, but the milk produced must be sold on the conventional market. Processors and buyers are providing transition payments to producers who sign contracts as well as “signing bonuses” to facilitate increased adoption of organic practices. Some states, such as Vermont and New York, have initiated programs to provide additional incentives for producers who want to transition as state agricultural officials see organic dairy production as a way to sustain the family farm. Many of the processors also provide technical assistance to transitioning farmers as well as sourcing supplies and grain.

So what do organic dairy farms in the US look like? Data from a survey conducted in Maine in 2003 indicated that most of the 60 producers in that state transitioned to organic dairy farming for financial reasons. Most felt that the higher premium paid to organic farmers would be sufficient to cover the increased costs of production and provide a positive return on their assets. Many of these farms were considering leaving the dairy industry and wanted to “give organic a try” before they made the decision to quit farming. Most of these farms transitioned in the late 1990’s and early in this century. At that time, milk prices were about \$0.46 per kg, and production costs were estimated to be \$0.397 per kg. (McCrary, 1999).

The organic dairy farm is characterized as being small (48 cow average in Maine and Vermont, 65 cow average in Wisconsin (Barham et al., 2006)). Production per cow in both regions tended to be less than conventional farms of similar sizes (18 kg per cow per day in Northeast and 23.5 kg per cow per day in Wisconsin).

More recently, a comprehensive study by researchers at the University of Maine and the University of Vermont looked at financial performance data of 30 farms in 2004 and 44 farms in 2005. Researchers also collected personal and management data from these operations. In 2004, these researchers concluded that based on the milk price paid to organic dairy farms in 2004, the average 44 cow organic dairy farm had a negative return on assets and equity (Dalton et. al., 2005). Organic herd sizes in the sample ranged from 20-80 cows with an industry average of 48 head. These herds are composed of predominately Holsteins, Jerseys, and their cross-breeds. Component prices, grazing ability, and milk production efficiency on high forage diets may be the driving force behind the breed choices.

A stanchion or tie-stall parlor with either pipeline transfer or dumping station are the most commonly found milking systems among organic farms. An average of 52 milking stalls are available in the dairy barn. An average of 1.25 milkers and helpers spend 1.66 hours milking for a total of 2.1 labor hours allocated per milking.

**Table 1: Herd holdings and productivity**

|                     | Profit tiers |        |      | Average |
|---------------------|--------------|--------|------|---------|
|                     | Low          | Middle | High |         |
| Cows                | 47           | 46     | 53   | 48      |
| Breed Mix (%)       |              |        |      |         |
| <i>Holstein</i>     | 30           | 34     | 57   | 40      |
| <i>Jersey</i>       | 40           | 49     | 16   | 35      |
| Total milking hours | 2.0          | 2.3    | 2.1  | 2.1     |

All organic producers rely on their pastures as an important source of forage during the grazing season. Seventy three percent of producers move their milking herd onto fresh pastures at least every day and more than half of the producers in each of the profit tiers move their herd to fresh pastures twice per day. On average, organic producers met 88% of their herd's annual forage needs with hay, haylage, silage, or greenchop grown on the farm. In addition to the forage ration, each milking cow received 5.4 kg of grain in the summer and 6.6 kg of grain in the winter, on average. Similar practices are noted between tiers. It should be noted that farms in these regions do not grow much if any of their own grain concentrate; almost all is purchased from sources throughout the country and Canada.

Organic herds received a total of ten visits from the veterinarian in 2004; four of these visits were unscheduled and for emergency purposes. There was no significant difference in the total number of veterinary visits paid to herds across profit tiers. Additional medications for the herd were purchased through either the producer's veterinary office, a local farm store, or a route truck.

**Table 2: Herd nutrition and health**

|                    | Profit tiers |        |      | Average |
|--------------------|--------------|--------|------|---------|
|                    | Low          | Middle | High |         |
| Forage purchased % | 12           | 6      | 18   | 12      |
| Grain (Kg/cow/day) |              |        |      |         |
| <i>Summer</i>      | 5            | 5.35   | 5.62 | 5.35    |
| <i>Winter</i>      | 6.2          | 6.62   | 7.2  | 6.7     |
| Veterinary visits  | 11           | 11     | 10   | 10.4    |

Organic producers reported an annual total of 6,180 labor hours (equivalent to two full-time employees) were utilized for farm activities in 2004. The largest portion of labor is supplied by the producer or their family members. Family labor and hired non-family labor provide 82% and 18% of the labor hours on the organic farm, respectively. Organic producers average 25 cows and 161,451 kg per full-time employee. Per labor hour, organic producers distribute 137 hours per cow per year. Within the sample of organic farms,

variation of pounds of milk sold per laborer and labor hours per kg sold annually across profitability tiers is statistically significant.

**Table 3: Labor utilization**

|                                    | Profit tiers   |                |                | Average        |
|------------------------------------|----------------|----------------|----------------|----------------|
|                                    | Low            | Middle         | High           |                |
| Labor usage (hours)                | 5,833          | 6,616          | 6,092          | 6,180          |
| <i>Family</i>                      | 5,068          | 4,800          | 5,259          | 5,043          |
| <i>Non-family</i>                  | 765            | 1,816          | 832            | 1,137          |
| Number of full time laborers (FTE) | 1.9            | 2.2            | 2.0            | 2.1            |
| Number of dairy cows per FTE       | 26             | 21             | 30             | 25             |
| <b>Kg of milk sold per laborer</b> | <b>138,873</b> | <b>134,916</b> | <b>464,335</b> | <b>210,582</b> |
| Labor hours per cow                | 135            | 150            | 127            | 137            |

Annual kg of milk shipped ranges from approximately 95,238 kg to 589,569 kg on organic farms, averaging 312,472 kg. The average milk shipped per cow is just above 6,350 kg. Disaggregating the organic sample reveals the variation of productivity between tiers within the organic group. Farms in the lower profitability tier produced significantly smaller amounts of fluid milk per cow and earned significantly lower revenue from milking operations.

**Table 4: Herd holdings and productivity**

|                        | Profit tiers |         |         | Average |
|------------------------|--------------|---------|---------|---------|
|                        | Low          | Middle  | High    |         |
| Cows                   | 47           | 46      | 53      | 48      |
| Annual Kg shipped      | 257,225      | 298,036 | 382,116 | 312,458 |
| Milk shipped (Kg/cow)  | 5,353        | 6,446   | 7,330   | 5,613   |
| Revenue from milk (\$) | 128,770      | 150,675 | 194,843 | 158,096 |

When trying to predict costs and returns to farms for 2005 and 2006, we simulated costs that would include higher fuel and purchased feed. Based on these simulations, we concluded that producers would need to receive about \$0.60/kg of milk to see a positive return on equity and assets. This is the price that producers in the region are now receiving. This study differs somewhat from what researchers in Wisconsin reported in a recently released study of organic farms in that state. Barham et al. (2006) reported that close to 60% of organic dairy farms reported household income increases of 60% between 1997 and 2003 and that they would need a pay price of \$0.37/kg to stay in business. The major difference between these two studies is the cost of purchased concentrate. Wisconsin producers on average produce some of

their own grains, while farms in the Northeast tend to purchase most of their organic grain supplements.

**Table 5. Cash Costs and Expenses Maine/VT - 44 farms 2005**

| <b>Cash Costs and Expenses</b> | <b>\$ per cow</b> |
|--------------------------------|-------------------|
| Auto                           | 43.16             |
| Bedding                        | 64.48             |
| Breeding                       | 45.98             |
| Chemicals                      | 1.35              |
| Custom hire                    | 72.70             |
| DHIA                           | 13.26             |
| Fertilizers                    | 19.18             |
| Purchased feed                 | 936.09            |
| Fuel and oil                   | 104.42            |
| Insurance                      | 72.00             |
| Interest                       | 124.29            |
| Hired labor                    | 338.21            |
| Marketing                      | 51.42             |
| Taxes                          | 62.47             |
| Rent                           | 47.07             |
| Repairs                        | 216.27            |
| Seeds                          | 13.51             |
| Supplies                       | 183.89            |
| Utilities                      | 125.93            |
| Veterinary                     | 39.38             |
| Medicinal supplies             | 6.31              |
| Miscellaneous                  | 60.75             |
| <b>Total Cash Expense</b>      | <b>2,642.10</b>   |
| <b>Total Milk Revenue</b>      | <b>3,134.00</b>   |

**Table 6. Return to Assets Sensitivity Analysis and Production Cost Simulation**

| Scenario       | ROA           | Average Milk Price<br>(\$/Kg) | % Change from<br>2004 Average |
|----------------|---------------|-------------------------------|-------------------------------|
| 2004 Observed  | -1.65         | 0.507                         | <i>Base</i>                   |
|                | Breakeven (0) | 0.515                         | +1.9                          |
|                | 4.1           | 0.587                         | +15.5                         |
|                | 5.0           | 0.600                         | +18.4                         |
| 2005 Simulated | -             | 0.507                         | <i>Base</i>                   |
|                | Breakeven (0) | 0.529                         | +4.35                         |
|                | 4.1           | 0.597                         | +17.9                         |
|                | 5.0           | 0.612                         | +20.9                         |

Several factors have changed how organic dairy farmers manage their cows. First, since purchased organic grains are extremely expensive, often double the price of conventional sources of concentrate, producers reduce the amount they feed. Quality, availability and consistency are also issues when sourcing organic grains. As seen in table 2, producers in the Northeast feed between 5 and 7 kg of grain to their cows to supplement forage and pasture. This is significantly lower than conventional farms. In addition to the cost of the grain, producers must weigh the challenges of disease and stress in cows that are fed for maximum production with rations that contain 50-55% concentrate. Most of the producers I work with choose an artificial limit of 30% concentrate in the diet. By doing so, they have also decided to breed their cows differently, including cross breeding. Organic farmers are choosing breeds that may produce lower volumes of milk, but may be better converters of forage to milk and can better withstand a negative energy balance in early lactation.

## ■ **Quality Milk without Antibiotics?**

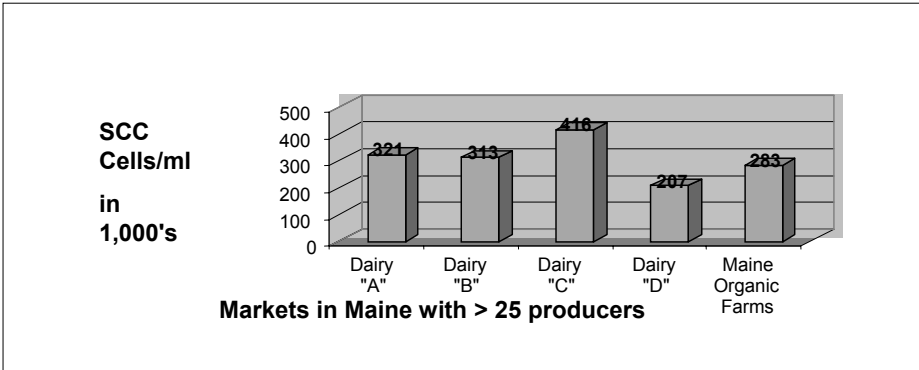
One of the major concerns for producers switching to the organic market has been the loss of antibiotics as a tool to combat mastitis. Certified organic farms are not allowed to use antibiotics as part of a treatment regime for cows, heifers or calves. If an organic producer does decide to use antibiotics as a rescue treatment, the animal must be removed from the herd immediately and may not return. NOP rules state that farmers cannot withhold treatments if the animal's welfare is at stake.

The majority of the milk shipped to organic markets is processed by Ultra High Temperature (UHT) pasteurization. This is done to facilitate the transportation of the final product and to maximize shelf life. Since most of the organic milk from the Northeast is UHT processed and producers cannot use antibiotics, the quality of the raw milked being shipped by organic farmers has often been questioned. However, when we looked at Somatic Cell Count (SCC) and Standard Plate Count (SPC) data from all Maine farms, organic milk shipped to processors appears to be of good quality, if not better than milk being shipped to conventional markets in Maine. Figure 3 shows monthly data from the 60 producers shipping to the organic markets in Maine along with SCC data from four other markets in Maine. The organic producers averaged a SCC count of about 283,000 for the period from January 2004 to October 2005. The producers shipping to the four conventional markets in Maine during the same period averaged from a low of 207,000 SCC to a high of 416,000 SCC. When we looked at SPC, the organic producers were significantly lower than two out of the 4 conventional markets for the same time period (Kersbergen and Schivera, 2006)

So how do these organic producers achieve such a high quality level without

the use of antibiotics? We surveyed 46 of the Maine producers to learn some of the protocols they adopted since becoming organic. Since organic grain is more than double the cost of conventional grain, producers tend to feed less grain to control costs. Feeding less grain reduces milk production, and many producers feel that it also reduces stress on their cows, which may result in a lower incidence of mastitis. One major factor may be in the quality incentives that organic processors are offering to their producers. One processor offers farms a bonus of \$0.04/kg to \$0.06/kg for milk that meets the standards of <150,000 SCC, SPC of <4,000 and a PI of < 8,000 colonies per ml. Another processor offers both incentives and deductions, with deductions beginning at >350,000 SCC. These quality programs have led to greater adoption of diagnostic tools such as the California Mastitis Test (CMT). Sixty-seven percent of the farms we surveyed now use a CMT paddle to identify problem cows and quarters with a high SCC. Most of these farms did not use this tool before they switched to organic production. Additionally, 11% of the farms use Dairy Herd Improvement Association (DHIA) records to identify high SCC cows. Once producers have identified problem cows, nearly 60% of them mark the problem quarters and milk them with a “quarter milker” to keep the high SCC milk out of the bulk tank. The high count milk is most often used as calf milk, as organic producers need to feed whole milk to calves for 60-90 days as part of their organic farm plan.

Some other practices identified by organic producers include the use of iodine based teat dips for pre and post-milking routines (85%) and individual paper towels (90%). Vaccinations are allowed under organic rules, but only 25% use this management tool for mastitis control. Treatment options for clinical cases of mastitis varied greatly from farm to farm. We were unable to reach conclusions about effectiveness of the wide array of products, since farmers had many differing opinions and outcomes after the use of the materials. Some treatment regimes included frequent milk removal, aspirin boluses, lotions and massages of the udder. Thirty five percent of the producers use intra-mammary infusions, either sterile herbal tinctures or non-sterile homemade recipes. Homeopathic remedies are also used by about 40 % of producers. Others used immune boosting supplements such as minerals, vitamins, herbs and garlic administered orally (Kersbergen and Schivera, 2006).



**Fig. 3 Average SCC (cells/ml, 1000's) by Markets in Maine (Monthly averages 1/04-10/05)**

## ■ Future of Organic Dairying?

What does the future hold for the organic milk markets? Most predict that the demand for organic foods and milk especially will continue to grow at double digit rates for years to come. Numerous states have witnessed a rapid expansion in farms transitioning. Several changes with the USDA NOP program will have an effect on how the organic industry expands. In June of 2006, the NOP ruled that farms must feed 100% organic feed for the full 12 months of transition. Previously the rules allowed for an 80% organic/20% conventional feed allowance for 9 out of the last 12 months of transition. This change has significantly reduced the number of new transitions in the Northeast.

A large portion of the organic milk supply in North America comes from large vertically integrated operations. These large (1,000 plus cow) operations produce organic milk for private labels such as Wal-Mart. With their size and structure, many organic advocacy groups are fighting these "factory" organic farms saying that they don't meet the requirements of the NOP and are tarnishing the reputation of the organic farm community. One of the major issues is the pasture rule. Two independent, national surveys from the Consumers Union and the Center for Food Safety show that consumers do in fact expect their organic milk to come from cows that are raised outdoors and on pasture (eco-labels, 2006). Currently, many of the largest organic farms in Colorado and Texas are loose housing operations with animals getting a small percentage of their nutrient needs from actual pasture. Farmers have petitioned the NOP to clarify the rule and include some minimum dry matter intakes of animals on pasture. The proposed rule (which was to be released in Dec. 2006) states that animals must get at least 30% of their dry matter intake

from pasture during the grazing season (120 days). This may limit the growth of these large operations and favor smaller traditional operations. On the other side of the spectrum, some animal rights advocacy groups have been challenging standard dairy practices, including stanchion barns.

Currently, organic production with its significantly higher milk premiums seems to be providing an economically viable alternative for small producers to remain in business. Researchers in Wisconsin also found that the switch to organic production in that state has given rise to dairy farmers who are far more satisfied with their income and quality of life. These same farms were also more optimistic about the future viability of their operations as compared to their conventional counterparts (Barham et al., 2006).

**Table 7. How much do organic farmers get paid for a gallon of fluid milk?**

- The answer is simple; the average "farmgate price" is \$2.25 per gallon.
- The consumer pays anything from \$3.19 to \$4.19 for a half gallon in the store.
- The average retail price for a half gallon is \$3.61, which makes a gallon price of \$7.22.
- The farmer receives 31% of the retail price. If the share that the farmer receives increased to 35%, they would receive \$2.52 per gallon, close to what Northeast organic dairy farm families need to have a living wage and be able to maintain their farms.
- If the average price that the consumer paid went up by an extra \$.20 per gallon (\$.10 per half gallon) and the processor and retailer gave a total of 3% of its share to farmers, the same result could be achieved.

<http://www.nodpa.com/>

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