Milking the Truth: The Facts about Dairy Farming in the United States

Objective(s)

This paper provides an in-depth description of the farming aspects of dairy production in the United States. Its main goal is to educate readers about the history of dairy farming, the differences between conventional and organic dairying today and where dairy farming is heading.

Summary of Findings

- Milk is an important American economic good, not only because Americans drink a lot of milk and consume its by-products, but it is also a significant export.
- Dairy farmers have suffered through economic troubles in the recent past due to changing milk prices, high input costs and not receiving adequate compensation for their work.
- Milk became a bigger percentage of American farming during the Industrial Revolution and the various technological and educational improvements that accompanied that time.
- There are many specific aspects to dairying that facilitate a productive farm. These include cow type, feed type and barn type. Farmers must choose how to manage their farms within these categories based on their monetary funds and herd size.
- Organic dairies differ in what they feed their animals, the lack of growth hormones and many other components later discussed in the paper.
- Today, farmers are lobbying for increased government regulation in order to maintain their economic security. They would like the upcoming Farm Bill to include some of these amendments.

Recent Dairy Consumption Trends

Milk is an important good sold in the United States and Americans have developed a farming system that produces large amounts of inexpensive milk with a fewer amount of cows. In fact, the U.S. is the second largest producer of milk, producing 86.8 million tons year, while it only has the fifth largest population of cows. It is one of the leaders in milk exports, and at the same time it is the third largest consumer of milk and milk products.

Milk has become a staple in the American diet. More specifically, citizens are bombarded with milk advertisements, including “Got Milk?” ads that highlight and promote

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professional athletes who endorse that milk is the reason why they are as successful. The USDA then reassures Americans that milk is a part of a healthy diet. We are told to consume two to three servings of milk/dairy a day. In the news, numerous articles describe the increase in milk production and the benefits of this growth.

More recently, some dairies have been doing quite well. With the recent popularity of Greek yogurt, a product that needs more milk to be produced than regular yogurt, dairies in New York and around the country are expanding. On a global scale, the increase in milk production and demand for more dairy farms coincides with rise of dairy as a status symbol. Milk is now a mark of new money, and with many emerging economies like China, India and Latin America, people are demanding more milk. As one of the world’s largest producers, the United States is benefiting from this growth. Farms are growing and farmers are being called upon to produce more.

But, many of these articles neglect the fact that farmers are not seeing the profits of growth. Few articles describe the plight of the farmer in detail and there is very little understanding of the ins and outs of dairy farming. After the 2009 economic crash, dairy farmers lost one fifth of their equity, a sum of over $20 billion dollars. During the time, prices soared on milk, but the farmers’ allocation did not. The economic characteristics of dairying will only be touched upon in this paper. First, in order to understand how or why dairy has become the sizable American economic industry, it is important to understand the basics, the physical farming.

The Rise of American Dairy Farming

Milk as a beverage coincided with the domestication of goats and sheep in 9000 B.C. in Iran and Afghanistan. Instead of focusing on all types of milk, this paper will focus on cow’s milk, which began when cattle became herded in 7000 B.C. in present-day Turkey and East Africa. In order to narrow down the topic of dairying even more, this paper focuses solely on dairy farming in the United States.

Dairy became a part of American life early in the colonization process. Some of the earliest settlers brought cattle from their various European homelands in the 1600’s. Before industrialization, milk was primarily drunk locally, in rural communities, from cows that were hand milked. This soon changed after the Industrial Revolution. Small farms could not supply the needed amount of dairy for the large populations of urban dwellers. Because of this, dairying adapted to incorporate large-scale production methods. But, the actions and developments of the late 1800’s and early 1900’s are the primary drivers of the large American dairy industry today. One of these events include Louis Pasteur’s introduction of pasteurization.

Pasteurization evolved in the 1860 after Louis Pasteur developed a system that heated wine in order to kill organisms in wine. While it was first opposed in dairy production,

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2 More information on advertising and milk in Amber Bushey’s paper.
3 Neuman, William.
4 Arnold, Wayne.
5 “Foundation for the Future Dairy Policy Programs.”
6 Cavette, Christopher.
pasteurization quickly became a standard in American dairy in 1914.\textsuperscript{7} Pasteurizing milk involves heating the liquid to a specific temperature and then cooling it quickly. In doing so it reduces the number of pathogens that cause disease. Pasteurization is one of the main reasons why milk today has an extended shelf life versus quickly spoiling as it did in the past. It allowed urban dwellers the opportunity to purchase milk in a convenient setting, away from the farm they were already so removed from.

During this time, breed associations also began, which sold the “ideal” dairy cows. These associations developed specific types of cows in order to provide the highest quantity of milk, most efficiently. Popular dairy cows today include Holstein, Guernsey and Jersey. Coinciding with the movement of breed associations, the Morrill Land Grant Acts in 1862 established agriculture colleges. Farmers were suddenly able to learn more about the science behind breeding, feeding and animal management. Because of this, farmers increased the cows’ milk production by maintaining healthy animals and using land effectively. Today, farmers treat their practice as a science, closely monitoring the cows.\textsuperscript{8}

Classroom education also introduced farmers to the newer technologies. One of these was milk separation. A milk separator removes milk fat from milk. The different milks with different fat contents could then be made into different dairy products including cream, cheese and butter. Dairy farming, size and production increased with the increased demand for these products. Other technologies included testing all herds of cows for diseases and illness. These tests helped eliminate milk as a source of tuberculosis, instilling a new faith in the product and making it more reliable and popular.\textsuperscript{9}

The centralization of American milk farming also helped advance milk production. During the first half of the twentieth century, most dairy population centers were located centrally in the United States, in the Great Lakes Region. Since most of the milk was produced in one place, the technological advancements including refrigeration and bottling was localized and the milk was more easily sent to various locations by train.\textsuperscript{10} As technologies improved and it became easier to transport milk, farms expanded to different areas of the country. Today, dairy farms exist all over the United States and California has become the largest milk-producing state.\textsuperscript{11}

Key Elements of Conventional Dairy Farms

The most important input in the dairy production line is the cow. As previously mentioned, after the formulation of breed associations, the type of cow became genetically selected and produced. Unlike other parts of the world, the United States uses specific cows for dairy consumption versus meat consumption.\textsuperscript{12} Today, 90% of American dairy cows are Holstein cows.\textsuperscript{13} Originally from the Netherlands, Holstein cows came to the states in the 1880’s.\textsuperscript{14} They are the preferred dairy cows because they produce large amounts of milk that is

\textsuperscript{7} "Dairy Production." EPA.
\textsuperscript{8} A farmer’s role is described in more depth in the next section.
\textsuperscript{9} "Dairy Production." EPA.
\textsuperscript{10} "Dairy Production." EPA.
\textsuperscript{11} United States. United States Department of Agriculture.
\textsuperscript{12} "Dairy Production." EPA.
\textsuperscript{13} See photo of a Holstein cow in the Appendix.
\textsuperscript{14} “Holstein.” Breeds of Livestock.
rich in both protein and butterfat. Because of this, they provide good, drinkable milk, as well as milk that serves as a base input for other milk products.

Holstein cows not only produce a large amount of milk based solely on their genetics, but farmers use specific feeds in order to stimulate growth. In order to produce the huge amounts of milk that Americans and the rest of the world demands, cows need a lot of carbohydrates and protein. In the Midwest, a dairy cow’s feed is usually made up of corn silage, alfalfa or grass silage, alfalfa hay, ground or high-moisture shelled corn, soybean meal, fuzzy whole cottonseed, and perhaps other commodity feeds. On average, a dairy cow will eat between 75 and 100 pounds of this feed a day in order to constantly produce milk. Since these cows are their livelihood, farmers work diligently, monitoring how much each cow has consumed and providing more food when needed. Many farmers grow their own corn, alfalfa and grass as well as mix their own feed.

After a farmer has chosen their specific cow breed and has grown and stored endless amounts of feed, the next step is choosing a barn type. In conventional and organic farming systems, there are three popular barn styles; tie stall, open lots and freestyle stalls. There are benefits and downfalls to each of them. In a tie stall, cows have individual, enclosed stalls. While it doesn’t allow cows to walk around, it provides comfortable hay mattresses and a lot of personal interaction with the farmer. Farmers are able to monitor a cow’s feed intake closely and make sure they are at their highest production rate. An open lot conversely allows cows to graze freely, but makes monitoring feed consumption more difficult. Open lots are usually outdoor, but since cows cannot survive the cold all year-round farmers must also have an alternative space. Paying for various facilities can become expensive and inconvenient. The freestyle barn combines aspects of the two other types. Cows are able to roam within an inside barn, and also have their own individual stalls. Freestyle barns are the most common in the United States and we were able to see how one operates at Wolf Creek Dairy. We watched as cows walked around, fed at their own leisure, and then returned to their individual stalls to rest.

Within these different barns are specific areas for cows at different stages in the dairy process. Not all cows are always producing milk, some are dry and some are calving and therefore need different, designated areas. Since cows at these stages need different nutrients at different levels, the separate areas allow farmers to control nutrient intake and regulate their farming practices. Some of these subsections include areas for dry cows, maternity pens, and an open calving area for newborns. The areas are not much different in comfort levels; they simply divide the barn in order to manage the dairy cows most efficiently.

Arguably the most productive area of the barn is the milking parlor. There are many types of milking parlors including step-up, parallel, and rotary. The most popular parlor used in the United States is the herringbone. In the herringbone, cows enter and stand next to each other on an angle. Milking equipment is attached from behind and milking last a matter of minutes. It is the preferred method because of its easy milking process, high cow comfort and efficiency.

On our field trip we saw that Wolf Creek Dairy used this kind of milking technique and Cedar Summit used the step-up parlor. Why a farmer chooses a specific type of parlor is often

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15 "Dairy Production." EPA.
16 Wolf Creek Dairy did exactly this and a big percentage of their farm was devoted to producing feed for the dairy cows.
17 There are also farms with open pastures and grass-feeding, but due to space, they will not be described in detail in this paper.
18 See Appendix for a photo of a free style barns.
19 "Dairy Production." EPA.
based on the size of the dairy operation. Since Wolf Creek was a larger dairy it needed to milk more cows at a faster pace and the efficient herringbone system gave the farm a better way to compete. Cedar Summit, a much smaller business, chose the step-up because they milked their cows less frequently and didn’t need to fit as many cows in the production line. There are few distinct differences between conventional and organic systems, only that many organic farms are smaller and do not need large-scale milking.20

Once the cows have been milked, the milk temperature is decreased to a shippable temperature and picked up by the processing company. The farmer starts the process all over again, making sure the cows are comfortable, providing ample amounts of feed and producing as much milk as possible.

Organic Dairying and its Differences

While most people drink conventional milk, organic dairying has also evolved into an important sector in the milk industry. In 2005 it made up 6% of the dairy market share.21 In 2011, Organic Valley, a Wisconsin dairy cooperative that began its operation in 1988 with only eight farmers, saw its company expand by almost 25%. Now, a cooperative with 1,658 farmers in 35 states and three Canadian provinces, its sales shot up from $620 million in 2010 to $715 million in 2011.22 The company added over 200 farms last year. But, in order to understand this growth in the organic side of dairying, it is important to understand the differences between organic and conventional milk and why some people may be making the switch to organic milk.

Organic farming has been practiced since the 1940’s, but organic dairy farming began truly evolving with the initiation of more strict guidelines in the Organic Food Production Act of 1990.23 The act required the Secretary of Agriculture to create a comprehensive list of allowed and prohibited substances in dairy farming. With these new rules, farms needed to comply with a national standard and consumers were able to better understand what about organic farming was different. In regards to dairy, organic milk is different in several ways.

First, organic milk has no antibiotics. This means that if an organic dairy cow becomes ill and needs to be treated with antibiotics, its milk will not be used anymore in the organic production line. We learned about this first hand from Dave and Florence Minar at Cedar Summit Creamery.24 When they have had cows that have become ill, they then sell that cow to another farmer who can use either its milk or meat under conventional standards.

Organic milk also has many beneficial nutrients that conventional milk does not. In a 2011 study by Newcastle University, research found that organic milk had significantly higher percentages of beneficial fatty acids, antioxidants and vitamins. During the summer months in particular when cows are able to graze more freely, one of the beneficial fats called CLAs (conjugated linoleic acids) was 60% more prevalent in organic milk than conventional milk.25 One of the reasons for this difference is because feed for organic cows does not contain additives.

20 There are exceptions to this like Organic Valley milk, which is a large-scale organic milk cooperative.
23 "Dairy Production." EPA.
24 Information learned from our informal conversations with Dave and Florence at Cedar Summit Creamery.
25 "Newcastle University." Organic Milk Is Cream of the Crop.
On our field trip we were able to see the differences first hand. At Wolf Creek Dairy cows were fed a mixture of corn, alfalfa and a protein and growth mixture. Cedar Summit did not provide any feed for the cows and instead the cows were 100% grazed and grass fed. Because of the difference in feed, Wolf Creek Dairy produces a greater volume of milk. Each Wolf Creek Dairy cow is milked three times a day, producing approximately 80 pounds of milk. A cow at Cedar Summit is milked twice a day and produces approximately 30 pounds of milk. Many organic dairies still use feed, (the cows are not always completely grass-fed), but it does not have the additives that a conventional dairy farm uses. Organic feed is grown without pesticides and is bovine growth hormones (BGH) free. Many people are willing to pay a higher price for organic milk because the BGH hormones are thought to cause illnesses to humans.

While organic milk may be more expensive, sometimes double the price of conventional milk, as shown by the growth in the organic industry, many people are willing to pay the higher costs. Consumers not only like organic milk because of its health reasons, but on a more basic level, because of its taste. On our field trip we were fortunate enough to sample the organic milk. In comparison with the Land-O-Lakes brand we had at Wolf Creek, the grass-fed, organic milk tasted creamier and richer. Some people like this taste and others don’t. In various blind taste tests, the results have been mixed. In a poll done by the Huffington Post, 56% of participants liked organic milk more, but many did not taste a difference or did not care either way.

Problems with Dairying and Protecting the Future Dairy Farmer

After learning about the conventional methods of farming, the many different components that a farmer must constantly work through and the adjustments that farmers make every day, it is no wonder that farmers would be upset with the insecurity they face if their milk does not sell, and if there is too much milk being produced. Most recently, farmers have been working together to ratify these issues. They are calling for more support and have created the Dairy Security Act (DSA). To overview, the DSA is a voluntary program that will not increase consumer milk prices, but it will keep farmers from huge losses that would put them out of business. Even when prices plummet, cows still need to eat the same amount of feed and the farm still has the same costs for its inputs. The act will provide a safety net for farmers when prices fluctuate and overall it acts as a “stabilization” program so that farmers will not feel the same losses they felt in 2009.

DSA focuses on the fact that many farmers do not receive the adequate allocation of the selling milk price and profit. While the act cannot truly change prices, it can provide monetary stability for the unstable weather effects or other inputs that can drastically change alter profit margins. The DSA was recently approved in the upcoming farm bill and should help dairy farmers across the country.

Another program includes the Market Stabilization Program (MSP), which aims to only produce the amount of milk demanded by the market. The program begins when there is more milk being produced than demanded and ends when the market is finally stable.

26 The two farms also produce different amounts of milk because of their two farms work with different breeds of cows.
27 The negative repercussions of the dairy industry are more fully developed in Aun Hussain’s paper.
28 Sheevel, David.
29 Thomson, Julie R.
30 “Foundation for the Future Dairy Policy Programs."
These two programs both work to ensure the dairy farmer’s livelihood. While bigger companies and post-farming corporations often see huge profits from milk, farmers can be neglected. As shown in the previous sections, farmers must account for many factors in making their farms run smoothly. Second to the cows, they are the most important part of the dairy chain. Farmers ensure that there is enough milk for all those that currently demand it, and those who will demand it in the future. With the prospect of a world population of nine billion by 2050, and the fact that many countries are becoming increasingly wealthy, dairy farming will only grow in importance. The effects of climate change and input resources are uncertain, but the dedication to improving the farm bill and farmers’ lives can only help stimulate and protect this growth.

Appendix

Photo of a Holstein cow.

A photo from our field trip -- Some of the class inside of Wolf Creek’s freestyle barn.


