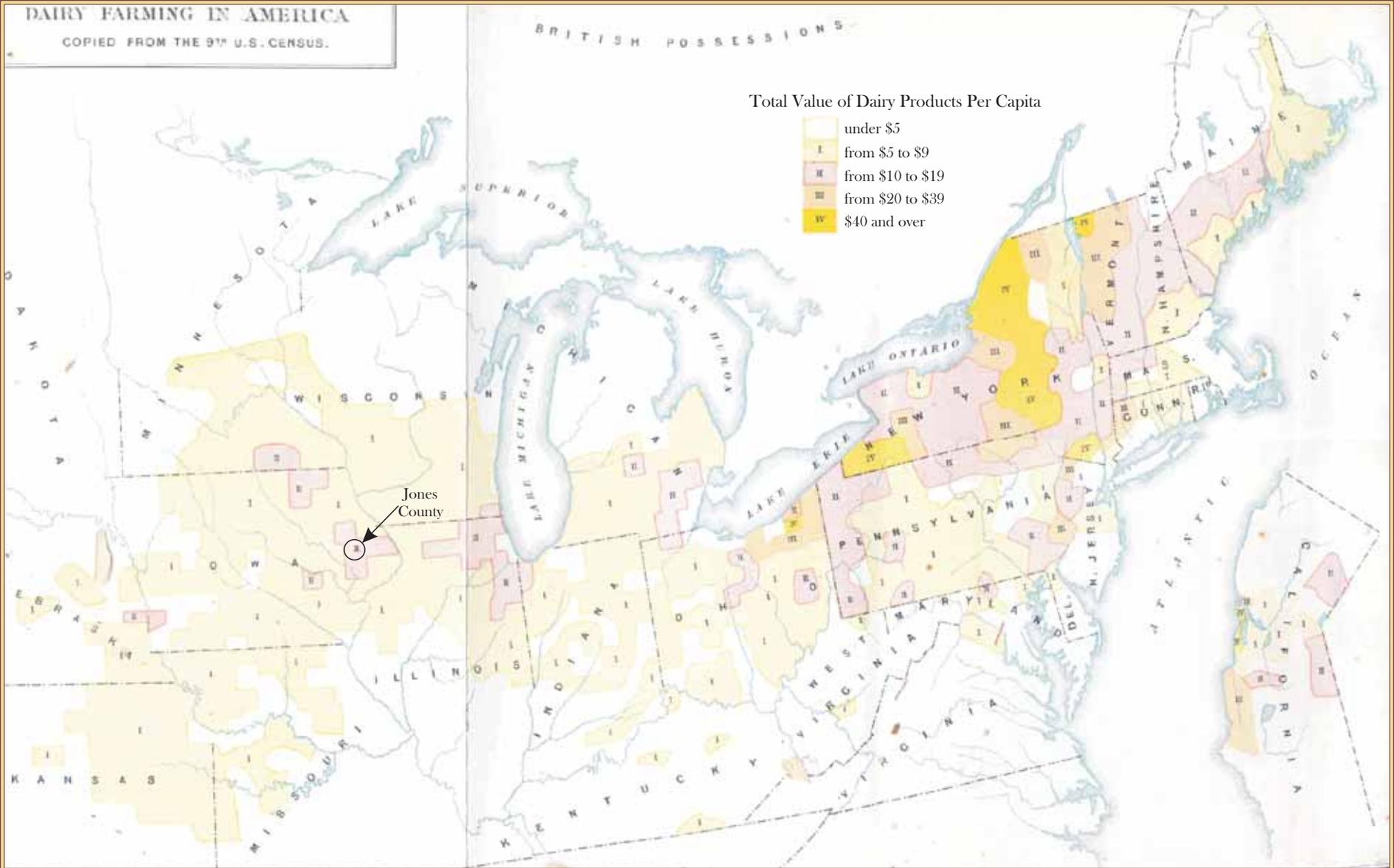


DAIRY

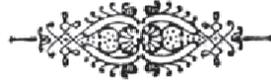
DAIRY FARMING IN AMERICA

COPIED FROM THE 9TH U.S. CENSUS.



Dairy Farming Map of the United States of America

Map image from J. P. Sheldon, *Dairy Farming, being the Theory, Practice, and Methods of Dairying*. Cassell, New York (ca. 1880) p. 367.



Little Dairy on the Prairie

From Butter-makin' Women to High-tech Agriculture

BY

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PRINTING BY

THE UNIVERSITY OF IOWA PRINTING DEPARTMENT

In 2001, extensive archaeological excavations were conducted at the Oneida Cheese Factory in Jones County. The county is a microcosm of larger dairying trends found throughout northeast Iowa, the state's premier dairy-producing region. Jones County moved from homemade cheese and butter production by farm women, to the industrialization of the dairy farm and opening of cheese factories and butter creameries. A number of innovations affected the industry around the turn-of-the-twentieth century, including reliable butterfat testing, the introduction of ensilage (silos) that created year-round milk production, and consolidation of the many local creameries into larger cream-

ery organizations, such as the Diamond Creamery run by Henry D. Sherman of Jones County. Iowa's dairy industry of today looks very different from its heritage: consolidation and competition have drastically reduced the number of cows, dairy farms, and processing plants. In recent years, northeast Iowa has become the center of a movement to revitalize Iowa's dairy industry, particularly through the use of value-added strategies, such as niche markets and large regional co-operatives: the lessons from Iowa's dairying legacy are resurfacing as a solution to modern agricultural challenges.

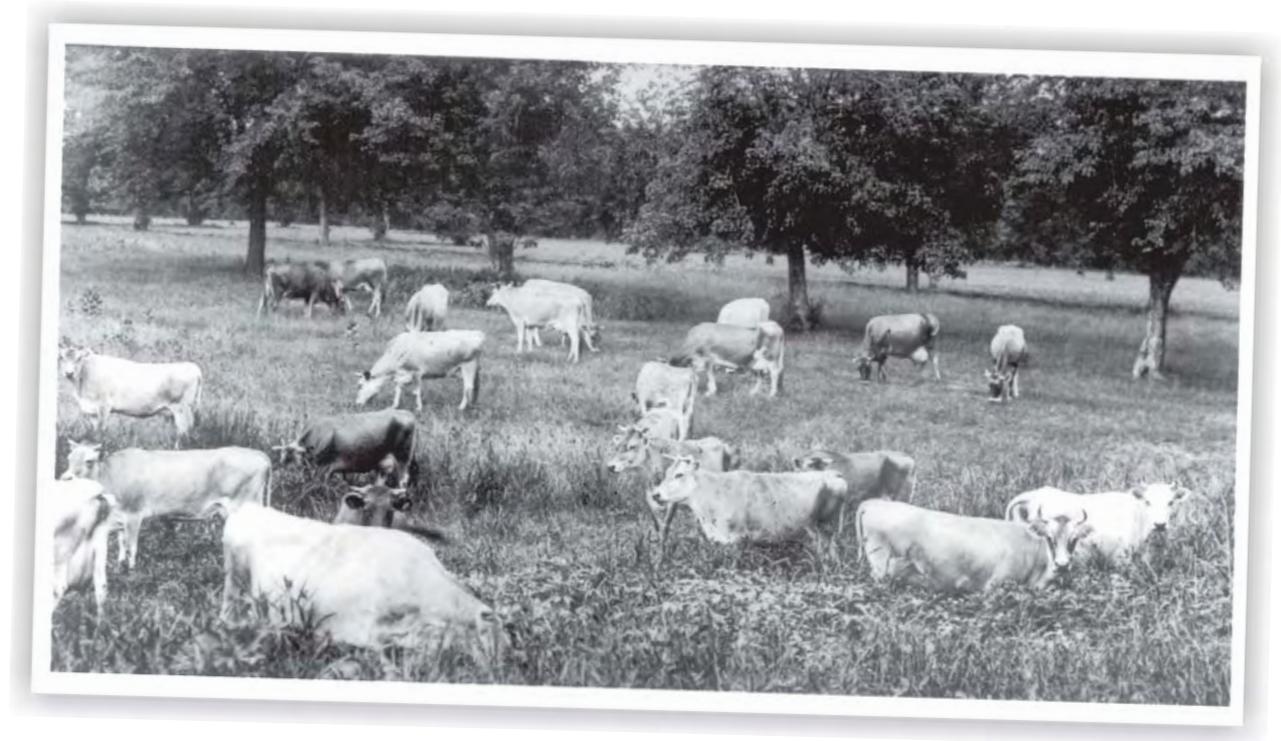
Document sponsored by the Iowa Department of Transportation through an agreement with the Federal Highway Administration and the State Historical Society of Iowa.

Dairy Production in Jones County and Northeastern Iowa Today

Dairy cows appeared in Iowa from an early date, with the United States Dragoons having at least one milk-producing “beeve” on their 1835 expedition through central Iowa.¹ Archaeological excavations of a fur trading post of the same period, south of Iowa City, suggests the trader also had a milk-producing cow.² Early Iowa settlers often brought at least one dairy cow with them upon moving to the state, or acquired one or more shortly after. In this manner, individual farms could meet their own milk, cream, butter, and cheese needs.

Starting in the mid-1860s, cheese factories were organized in Iowa, followed in the next decade by butter factories or creameries. These commercial establishments pooled the milk resources of neighboring farmers to produce a surplus and in short order encouraged farmers to increase their herds and improve their milk quality. Cheese had a local market, while butter was often shipped out-of-state, particularly to the East Coast. These first establishments usually collected milk from dairy farmers living within a three-mile radius of the factory. By the 1880s, cheese factories were disappearing from the Iowa landscape and consolidated creamery companies arose. Creamery co-operatives were formed to counterbalance what many dairy farmers viewed as unfair cream and milk payments by the largest of the consolidated creameries.

Jones County is located near the southern boundary of Iowa’s most dairy-intensive farming region. In pounds of butter produced, the county ranked between 11th and 23rd of Iowa’s 99 counties between 1860 and 1895. Using number of creameries per county to determine leadership, Jones County ranked in 1st place in 1887 (with 41 creameries). Other leading



Cows grazing in the pasture. Courtesy of State Historical Society of Iowa, Iowa City.

creamery counties of that era included Fayette, Linn, Delaware, Black Hawk, Mitchell, Chickasaw, and Buchanan. By 1895, Jones County had dropped to 8th place with 18 creameries while neighboring Delaware County had the most, with 29 creameries.³ A handful of the 1890s and later creamery buildings remain in Jones County today, although all are used for non-dairy purposes, such as storage, housing, or commercial use. One cheese factory building may also remain, although it has been moved off of its original cheese factory site.

Consolidation in Iowa’s dairy industry can be traced to the beginning of the twentieth century and the introduction of the hand separator. Invented by the De Laval Company, in 1885, its use did not become widespread in Iowa until the turn of the centu-

ry. By 1905, there were 49,130 such machines in the state, a huge increase from 1898 when there were just 904 in use. Half of the butter produced in 1905 came from hand-separated cream. In Iowa, where a hogs-and-corn farm economy had developed, butter’s by-product of skimmed milk was important, due to its feeding value. Because of the emphasis on livestock raising in the Corn Belt, butter-making and not cheese-making came to dominate the dairy industry in the state, even in the great dairying region of northeast Iowa. During the early 1900s, northeast Iowa farmers also led the way in adopting new practices such as the use of ensilage and scientific feeding, being encouraged to do so by farm editors and the new Iowa State Agricultural and Experiment Station in Ames.⁴

The quick adoption of the hand-separator by farm-

ers created “something of a revolution” in the creamery system. Farmers could now ship their own product to markets in other parts of the state, as well as to cities outside the state resulting in the formation of large “centralizing” plants. By 1905, centralizing plants were producing more than one-fifth of the state’s creamery butter. (The Diamond Creamery in Monticello an example of a centralizing plant in Jones County in the early twentieth century.) Whereas in 1900, most of the state’s creameries were small factories processing the milk of a few hundred cows—in some cases less than two—in 1906, there were few creameries in the state producing less than 150,000 pounds of butter a year. This was a marked increase over an average output per creamery only three years

before of 97,770 pounds. Indeed, there were many creameries by 1906 that were producing between 250,000 and 500,000 pounds of butter a year. Increasingly, Iowa butter was being sold in Chicago and eastern markets, such as New York. As the creamery system became prevalent throughout the state, cheese-making declined, with the number of cheese factories dwindling from over 100 in the late 1880s to just a handful by 1910.⁵

The large centralizing plant became more common in areas where dairying was practiced only marginally by farmers, as it gathered cream from a territory of many miles. In areas where more creameries clustered, in the northeast part of the state at the turn-of-the-last century, many of these tended to be smaller

plants serving a local neighborhood of farmers. The cooperative creamery movement that was on the rise after the depression of the 1890s was also concentrated in this region. According to historian Vernon Pinkham, in areas where farmers relied more heavily on the profitability of their dairying enterprise, they were more likely to band together in cooperatives to ensure they received the best price for their milk. Today, there are just five remnants of the old cooperative creamery system, all but one of which are found in Northeast Iowa: they are located in Staceyville, Waverly, Lake Mills, Dyersville and Independence. None of these manufacture butter any longer, operating today as fluid milk bottling facilities.⁶

The development of the modern Iowa dairy indus-

BUTTER QUALITY AND SANITATION

In sections where large centralizing plants predominated, an unintended consequence of the hand-separator system when it was first adopted was the decline in butter quality that resulted. With so many different farmers separating their own milk and sending it to a single plant, it was easier for the supply to become adulterated with poor quality cream. Not all farmers were diligent about cleaning and scalding the separator between uses, or storing cream in clean vessels and at the proper temperature. Meanwhile, the creameries themselves were competing so fiercely for the cream supply that poor quality was often overlooked. Many plants were also lax in their testing of butterfat, not wanting to lose any patrons to their competitors. This became such a problem, in fact, that at the 1906 meeting of the Iowa State Dairy Association, the association’s president declared improving the state’s butter quality to be the “greatest and most important question for us to consider today.” Iowa State’s professor of dairying declared that the butter being produced was worse than a decade before and that furthermore, “the quality of cream furnished to many of our creameries today is a disgrace to any civilized people.”

Both Dairy Commissioner Wright and the Iowa State Dairy Association called for government regulation to address the problem and to protect the smaller creameries being forced out of business. Wright contended that the number of creameries and butter stations had fallen from 994 in 1900 to 552 in 1908, often due to unfair pricing practices used by the large centralizing plants, which paid patrons more than the fair market value for their cream and more than the smaller plants could afford to pay. In response to lobbying by Wright and the Dairy Association, an anti-discrimination law was enacted in 1909 to prohibit unfair pricing (of eggs, poultry, and grain as well as milk and cream) being used to force smaller competitors out of business. Both public pressure and lobbying from the dairy industry attributed to the pure food law of 1906, as well as the amending of the state’s dairy laws. Enforcement of the stricter rules was given to the Dairy Commissioner, now the State Dairy Commissioner. His authority extended to regulating “the manufacture, sale and transportation of dairy products within the state, including the right to inspect all creameries, cars, wagons, and containers.”⁷ (Henry D. Sherman of Jones County served as the first Dairy Commissioner of Iowa from 1886 to 1890.)

try incorporating methods of scientific management and industrialized production was fostered by new regulations regarding cleanliness and sanitation. However, practices such as testing the acidity of the cream, pasteurization, and the use of commercial starters were slow to be implemented.

Creamery management had likewise been reformed, and even local managers of small creameries had to become experts in modern methods of operation in order to compete successfully with the larger plants and comply with government regulations. By World War I, butter-making in Iowa had completed the transition from producing butter of uneven quality into a modern, regulated industry with enforced standards of production. By 1921, the number of creameries was less than half the number that existed in 1900; however, production had increased by 40% from about 61.5 million pounds in 1900 to almost 86 million pounds in 1920. Along with Wisconsin and Minnesota, Iowa formed part of the “tri-state butter region” that produced much of the nation’s butter. Iowa alone was producing one-tenth of the nation’s butter by 1900.⁸

Much of Iowa’s butter was produced in northeast Iowa, the state’s butter district. Iowa’s dairy industry increasingly concentrated in this section of the state. In 1921, the state’s cheese factories, which had once been present throughout the state, were now concentrated in just three northeastern Iowa counties: Howard, Winneshiek and Allamakee.¹⁰ Of the 21 counties (including Jones County) with average herds larger than 20 cows in 1920, only Osceola County was

not located in northeastern Iowa, being instead situated in the northwestern section of the state.

By World War II, Iowa creameries were manufacturing more than 200 million pounds of butter a year. The state ranked third nationally in butter production and would continue to do so until the 1960s. By that time, a fundamental shift had taken place among dairy farmers that would transform the state’s dairy industry.¹¹



IOWA STATE FAIR BUTTER COW



Since 1911, the Iowa State Fair in Des Moines has featured a butter sculpture to promote the state’s dairy and livestock industries. Norma “Duffy” Lyon has been the butter artist at the fair since 1960. Previous artists included Frank Dutt, J.E. Wallace, and Charles Umlauf. Through the years, sculptures have included figures made from lard and butter and have ranged from dancing pigs to dairy cows to political candidates to Elvis to a Harley-Davidson motorcycle. In 2004 the butter sculptures included a cake celebrating the State Fair’s 150th birthday, a Jersey cow (one of six dairy breeds in Lyon’s repertoire), and a small dairy barn. Duffy Lyon, who lives on a dairy farm near Toledo, Iowa, noted that “we dairy farmers, know what it takes to create quality products. It takes passion, time and dedication to create the best products, and butter sculptures are no different. We love our cows and take pride in producing quality dairy products.” Duffy and her butter sculptures have gotten nationwide exposure including appearances on the Today Show, the Tonight Show with Jay Leno, and the Late Show with David Letterman and have helped create media exposure for both the State Fair and the state’s dairy industry besides being just plain fun!

The Beatrice Creamery Company, a local Nebraska-based dairy, began the butter sculpture promotion at the Iowa State Fair. The company later became part of ConAgra. Lard sculptures were often sponsored by the National Live Stock and Meat Board. Today, both the American Dairy Association and the Iowa State Fair Board sponsor the butter sculpture creations of Duffy Lyon, with Associated Milk Producers, Inc., supplying the butter. Lyon uses about 600 pounds of butter for a typical cow sculpture, with the butter reused for five years after which the consistency changes.¹²



Butter boxes.⁹

During the 1950s, farmers were increasingly switching from the farm-separated cream system to selling whole milk to processing plants. Skim milk was no longer being fed to the farmer's livestock. Since dairying was no longer tied to other aspects of the farmer's operation, it became more of a specialty. Particularly in northeast Iowa, where the topography was especially suited to dairying, many such operations were expanded, while other regions focused more on hog production or raising one or two crops, reflecting the larger trend away from mixed crop and livestock farming seen earlier in the century.¹³

Although the state's milk production was still at WWII levels, as was the amount of butter being manufactured, the way that milk was marketed and processed had changed significantly. In the 1940s about 80% of the state's dairy output left the farm as cream and about 20% as whole milk. By the 1960s, these figures had reversed.¹⁴

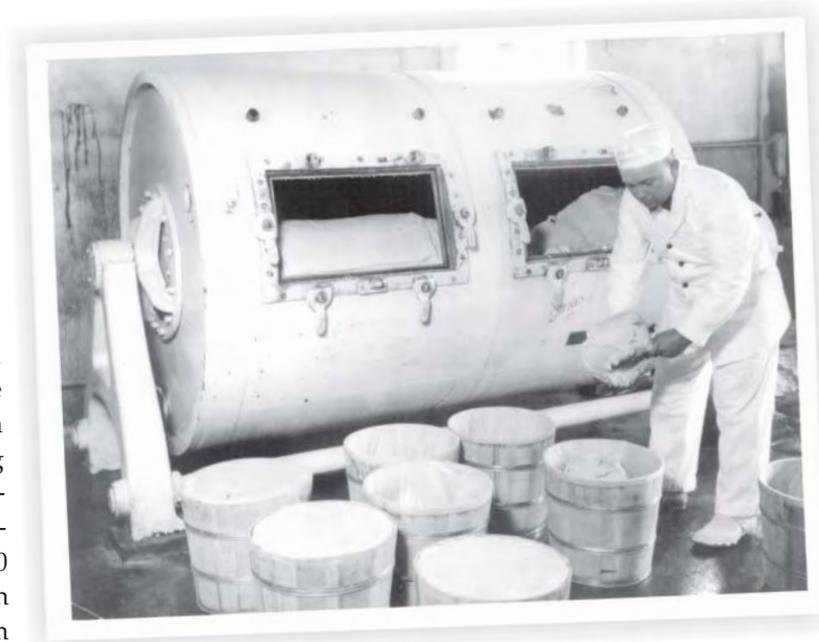
Creameries found they needed to handle large volumes of milk in order to operate at a profit. Machinery such as large industrial separators or milk-drying machines was expensive, and the cost of modernizing could not be offset by handling low volumes of milk. At whole milk creameries, milk was piped from the bulk storage tanks into large separators capable of separating 5,000 gallons of milk an hour. Such creameries needed to make about three million pounds of butter a year in order to be profitable. After the cream was processed into butter, the remaining skim milk, once fed to farmers' hogs, was sold to plants equipped with dryers.¹⁵

Drying was becoming increasingly common among processors by the 1960s. In 1964, over 200 million pounds of nonfat dry milk were produced in Iowa, compared with less than 20 million pounds in 1952. There had developed by this time a large market nationally for dried milk, which was sold to the processed food industry for use in baked goods and instant foods. About half the dried milk sold was purchased by the government and went into national

lunch programs and overseas relief agencies.¹⁶

The number of creameries in Iowa had fallen from about 500 before World War II to 240 in 1960. After 1960, the number of creameries continued to decline steadily. Of the approximately 200 remaining in the mid-1960s, about 30 were large processing plants equipped with both driers and separators, which were responsible for over half the state's butter production. Nearly a third of Iowa's butter was being manufactured in the state's 50 medium-sized plants, with the remaining 20% being produced in the 100 small creameries still in operation. In Iowa, where the creamery system had originated, and where it had played an important role in the farm economy, more butter was still being made in Iowa from farm-separated cream than in any other state. By 1980 there were only seven creameries still producing butter left in the state. By 1995, there was one creamery still producing butter on a periodic basis, located in a business called Potter's Siding in Tripoli, Bremer County. This facility stopped making butter around 2000.¹⁷

Another emerging trend in Iowa's dairy industry in the 1960s, which contributed to the decline of creameries, was the sudden growth of cured cheese manufacturing. In making the switch to handling whole milk, many low-volume plants found converting to cheese processing to be less expensive than becoming a combination creamery and drying facility. While it takes over 20 pounds of milk to make one pound of butter, only 10 pounds of milk is required to produce a single pound of cheese. In 1950, Iowa plants were producing around 10 million pounds of cheddar cheese, and by 1964 five times this amount was being made, placing the state fourth nationwide



Butter making, ca. 1900. Courtesy of State Historical Society of Iowa, Iowa City, Irving B. Weber collection.

in cheese production.¹⁸

This trend continued in the 1970s, encouraged by rising cheese prices, with more and more plants transitioning to cheese production. In 1960, there were 45 plants producing cheese, up from 13 in 1930. By 1995, 68% of the milk from Iowa's dairy farms was being processed into cheese. Eleven large-volume plants were producing various cured cheeses including cheddar, Colby, blue, mozzarella, Swiss, Havarti, Neufchatel and cream cheeses. At that time Iowa ranked fifth nationally in American cheese manufacturing and sixth overall in cured cheese production.¹⁹

The Iowa dairy industry of today looks very different from the 1960s. Both consolidation and competition have drastically reduced the number of cows, dairy farms, and processing plants. The decline is partly due to consolidation. The average size of each operation has increased in that time, with the aver-

age Iowa dairy herd increasing from 9.7 cows in 1960 to 75 cows today but is still far below the national average of 133 cows per dairy herd. New technologies in genetics, feeding, nutrition and other practices have led to an increase in milk production per cow. As production goes up, however, the number of herds declines. Iowa today has about 209,000 dairy cows, down from over 1 million in 1955. Since 1998, Iowa has lost approximately 25% of its dairy herds and 6% of its dairy cows.²¹

Since the 1970s, dairy production in the nation has been migrating to the West, with Idaho, New Mexico and Washington replacing Iowa, Ohio, and Missouri among the top ten milk-producing states. The number one dairy state in 2003 was California, where large population centers and a favorable climate have been conducive to large-scale dairying. Iowa ranked 12th in 2003 both in milk production and number of dairy cows.²²

The number of dairy farms in Iowa has shrunk from 138,000 in 1955 to 2,500 today, placing the state seventh in number of dairies. Today, the majority of Iowa's dairying farm families live in northeast Iowa and own 72% of the state's dairy cows. Consolidation has also significantly reduced the number of processing plants in the state, with the number of bottling plants contracting from 146 in 1960 to just seven in 1995.²³

The drastic changes in Iowa's dairy industry over the half-century have been felt most acutely in Northeast Iowa, which has lost 18 dairy plants since 1995. Because of the importance of dairying to the region, however, it has also become the center of a movement in recent years through the Northeast Iowa Community-Based Dairy Foundation to revitalize Iowa's lagging dairy industry.²⁴

Statewide efforts to bolster dairy farming in the state have included the restructuring of the Iowa State Dairy Association. Chartered by the state legislature in 1876, the organization was originally known as the

AWARD-WINNING IOWA CHEESES

Iowa cheeses today are well-regarded. They include the famous gourmet Maytag Blue cheese, made in Newton, Iowa, since 1941, and cheeses made at Swiss Valley Farms® Luana plant, located in northeastern Iowa. The Swiss cheese manufactured here has won numerous national awards, and the plant's cream cheese was named second in the world at the 2002 World Champion Cheese contest. Another Iowa cheese that has recently garnered nationwide attention is Schwartz und Weiss Blue, which just started production in 2004 at the new Golden Ridge Cheese Co-op in Cresco. The co-op was formed a few years ago by Amish dairy farmers in northeastern Iowa and southeastern Minnesota. Following the practices once common to all dairy farmers in Iowa, their blue cheese is made with milk from cows milked by hand and cooled in traditional 80-pound cans with winter-cut pond ice, rather than in bulk milk coolers. It was declared best blue cheese in the nation at the July 2004 meeting of the annual American Cheese Convention.²⁰

Northeastern Iowa Dairyman's Association. The group, which instituted the first Dairy Cattle Congress, was renamed the Iowa State Dairy Association in 1891. By the 1980s, the IDSA had ceased to play a significant role in the industry, its functions having been subsumed by the regional advertising and promotion organizations which emerged after 1970. In 2001, however, the IDSA board began a restructuring effort intended to "build the IDSA into an active voice

representing the Iowa dairy producer" specifically, reflecting a similarity to the Dairy Foundation's goal of refocusing attention on helping Iowa's dairy farmers.²⁵

Many producers have joined one of the huge regional co-ops—such as Associated Milk Producers Inc. (AMPI), a co-op with 4,600 member farms in seven states—that have evolved out of dozens of smaller operations. As a result, milk production and operator efficiency is up across the state. Yet, increased volume also helps to keep prices down, frustrating producers. Many are looking for ways to add value to their products.²⁶

Value-added strategies are proving successful in Iowa. Some plants operate on a large scale, such as Wells Dairy in LeMars, called the "Ice Cream Capital of the World." The huge complex packages over 2,000 dairy products, including Wells Blue Bunny® and Häggen Dazs® ice cream, and employs over 1,900 people. Other large-scale plants operating in Iowa are Anderson Erickson Dairy®, Roberts Dairy®, ConAgra Dairy Foods® Inc., and Swiss Valley Farms®. Small-scale producers are also turning to this strategy in response to depressed bulk milk prices, which reached a 27-year low in 2003. This approach has in some cases actually led to a return to traditional small-scale models such as creameries, as farmers look to Iowa's dairying heritage for solutions.²⁷

Other plants seeking to take advantage of the premium prices available in the organic and natural foods niche markets include a processing facility unveiled in Clarinda in March 2004 as well as one in Kalona, completed in 2003. Both facilities offer organic "natural" (non-homogenized) milk, cream, butter and cheeses. The Clarinda plant was built to manufacture ice cream and liquid yogurt as well. The Kalona facility was constructed in response to the need of Amish dairy farmers for a plant that could process their milk according to their cultural and religious principles. It handles milk from local Amish and Mennonite farm-

RADIANCE DAIRY

In 2003, the Radiance Dairy in Fairfield was the only on-site bottling facility in the state. Run by Francis and Susan Thicke, the plant processes and bottles non-homogenized milk from the farm's 65 cows, and produces whipping cream, yogurt and several cheeses. The couple markets their dairy products to local restaurants, Maharishi University, and grocery stores in the Fairfield area, where the premium prices paid for the couple's organic milk help offset the operating costs of the facility. The costs associated with starting even a small on-site processing facility like the Thickeys' can be formidable to an independent dairy farmer. Yet Francis Thicke insists, "I think that this is the time to get into specialized products," because, as agriculture becomes more industrialized, "with big farms and fewer farmers, the more niches that are created." The numbers bear out Thicke's impression. Not only is the nationwide market for organic milk growing—sales increased by 24.3% over a one-year period between 2002 and 2003, while the conventional bulk milk market declined by 3% in the same period—but as the success of other creameries has proven, there is high demand for a variety of locally-produced dairy items. Since the Radiance Dairy opened, several more small plants have started operation in Iowa, with some even incorporating butter-making back into the state's dairy industry.²⁸

Upper: family milking cows by hand. Courtesy of Iowa State University Library/Special Collections Department.



Lower: cheese manufacturing: packed and pressed cheese in final stages before curing. Courtesy of Iowa State University Library/Special Collections Department.

ers delivered in cans, just as the early creameries did.²⁹ Non-homogenized milk, once a staple in every household, required some reacquainting with Iowa consumers. However, once they learned to shake the milk before drinking it to dissolve the line of cream that forms at the top of the jug, the taste of the milk has won many over.

The industry has also expanded into a variety of other dairy products including yogurt, egg nog, whipping cream, half-and-half, cottage cheese, sour cream, buttermilk, and ice cream. Products such as skim milk, whey protein, caseinates, and lactose are also dried into powder to be sold as ingredients to both the food and pharmaceutical industries. Ice cream manufac-

turing had already developed into an important market for dairy farmers by 1920, and by 1995 Iowa was among the top ten states in the overall manufacture of frozen dairy foods. Currently, the state ranks third nationwide in ice-cream production.³⁰



Pioneer Dairying

Pioneer women typically were responsible for milking, cheese-making, and butter churning, with the resultant products meant for home consumption. Daughters and young sons assisted in these duties. Any surplus of home-manufactured butter and cheese was sold to other settlers, local merchants, and traveling butter dealers. Women's yearly income from cheese and butter sales could exceed their husband's income from grain and livestock sales. In the case of Emily Hawley Gillespie, who lived near Manchester,

NOT ONLY WAS MILK PROCESSING TIME-CONSUMING, BUT, GIVEN THAT REFRIGERATION WAS VIRTUALLY NON-EXISTENT, PRESERVATION OF ALL DAIRY PRODUCTS WAS DIFFICULT. GRO SVENDSEN, A NORWEGIAN SETTLER NEAR ESTHERVILLE, IOWA, REMARKED ON THE TRIBULATIONS OF FOOD PRESERVATION IN 1863:

It is difficult, too, to preserve butter. One must pour brine over it or salt it; otherwise it gets full of maggots. Therefore it is best, if one is not too far from town, to sell the butter at once. This summer we have been getting from eight to ten cents a pound. Not a great profit. For this reason people around here do not have many cows—just enough to supply the milk needed for the household. It's not wise to have more than enough milk, because the flies are everywhere.³²

Delaware County from 1861 until her death in 1888, her substantial butter income paid for the family's cloth, shoes, and school books, as well as food staples.³¹

Churning took place several times per week, with between two and ten pounds churned per instance. The butter would be saved until between 25 and 100 pounds of product had accumulated, then packed and sold. Cheese-making was a less frequent task and required more skill, particularly in timing the many steps involved and attaining a precise temperature when heating the milk. Although cheese is simple to make, flavorful high-quality cheese is challenging.

Home-made butter from Midwestern states initially had only a local market. Eastern butter dealers termed Midwestern butter "grease" in reference to the wagon axle grease it could resemble. Cheese received similar acclaim. This negative eastern view of Western dairy products was due to inconsistencies in manufacturing quality, with no large-scale producers on the scene to consistently produce a good product, coupled with the long time it took to transport butter in the pre-railroad era. Overall, it seems that home-made Western butter and cheese were of good quality, although it only took a few rotten cooks—and excessive transport time—to spoil the butter image.



Girls milking cows. Courtesy of State Historical Society of Iowa, Iowa City.



Churning butter in a barrel churn. Photograph courtesy of the Minnesota Historical Society Loc# GT2.51 p31 Neg# 11094.



ORANGE CO. BUTTER PALE.



ORANGE CO. BUTTER PALE WITH LID ON.



CHURN.

Butter pails and churn.³³



Dairy farmers waiting to deliver their milk to the Eldora Creamery, Hardin County, Iowa. Courtesy of State Historical Society of Iowa, Iowa City.

FACTORY DAIRY PRODUCTION

Pioneer women's surplus production of home-manufactured cheese and butter was the first important step in the industrialization of dairy farming. With more people moving into cities—and not owning their own milk cows—and the availability of rail transport to efficiently ship large quantities of fresh dairy products, the demand for butter and cheese increased during the late 1850s. But a dramatic profit could be made only if butter or cheese were produced on a grander scale than possible on a single farm.

Some farmers tried their hand at intensifying the scale of production, enlarging their dairy herds and purchasing equipment (like large cheese vats or 20-gallon butter churns) that could process greater quantities of milk into product. Oftentimes, this cottage industry was a family effort. Few of these large-scale cheese or butter producers made the transition to true factory production because start-up costs were prohibitive, the process was very labor intensive, and they had little experience at marketing cheese and butter.

The solution was obvious: pool together milk re-

sources of neighboring farmers at a single facility to process into a marketable product. One person and their assistant would be responsible for making butter or cheese and would not be distracted by other farming tasks. Thus began the true factory movement in the dairy industry.

Desiring to make their farms more profitable, farmers were optimistic that dairy factories could be the answer to a succession of crop failures, blights, commodity price instabilities, and general difficulties in making ends meet in the 1860s. The first cheese factory in Jones County, and probably the State, began collecting milk from neighboring farmers in 1864: Asa Bowen's Cheese Factory. The first creamery in Iowa, John Stewart's Spring Branch Creamery in Delaware County, opened for business in 1872. Factories could produce butter or cheese or both, with butter factories also known as creameries.

The farmer had to deliver cans of milk once or twice daily to the factory: most

farms lacked adequate refrigeration, such as milk cooling pools (semi-subterranean tanks with water circulating around the milk pails) or ice houses. In Eastern Iowa, factories served farmers within a seven-mile or lesser radius of the factory: hauling milk daily over greater distances left no time for other farming tasks. The farmer could obtain the manufacturing waste products to feed his livestock (whey, in the case of cheese-making; skim milk from butter-making).

The Factory System solved many problems. Farm men and women no longer had to make cheese or butter, both laborious tasks. Professional cheese and butter makers were not prone to spoiling large batches of product, as could sometimes happen at home. As cheese and butter manufacturing techniques were systematized in factories, the overall quality in-

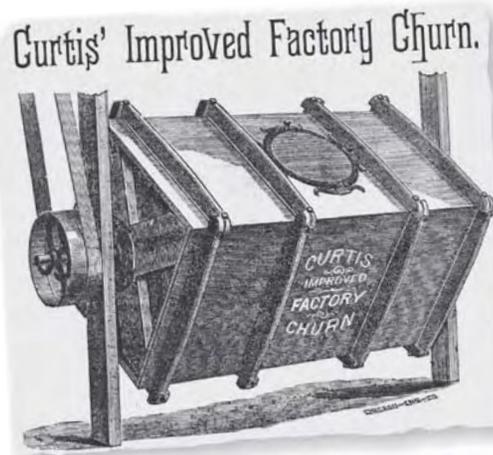
creased. Railroads could transport butter quickly and under refrigerated conditions. Also, factories had the resources to widely market their products, unlike most home-producers.

Cheese and butter dealers from Chicago and the East Coast traveled into Iowa to sample the fares and award seasonal contracts for cheese and butter delivery. Some Iowa factories sent representatives East to compete for top butter and cheese awards, thus attracting dealers.

The Factory System also posed new challenges to rural Iowans. Milk had to be delivered to the factory daily or twice daily, which expended great quantities of the farmer's time on Iowa roadways. This task was especially unwelcome during harvest and hay-making seasons. Some

IN HIS
RECOLLECTION OF EARLY
BUTTER MARKETING,
MONTICELLO-AREA FARMER JOHN
LORENTZEN (1880) RECALLED THAT
HOME-MADE BUTTER WAS SOLD TO
MERCHANTS IN

. . .tubs, in pots, nail kegs, fish barrels, prints, rolls,—some white, some yellow, some good enough to eat; some that was carefully combed, with no hair in it, and some that wasn't combed, with the hair mixed to keep it together. In this way it was collected and shipped off. It never came back! What it was used for remains a mystery to this day.³⁴



*Curtis' factory churn.*³⁵

farmers suspected they were not receiving prime dollar for their milk: there were many accusations flung between patrons and factory operators about milk payments. Early patrons were paid according to how many pounds of milk they delivered to the factory. Although the milk could be rejected if it was completely spoiled, all farmers were paid the same amount per pound of milk, whether their cow's milk had a high or low fat content. High fat percentage was most desirable, as it produced the most butter per pound weight. The factory operator could measure the amount of cream in a milk sample as compared to the other patrons milk (a comparative test), but many farmers grumbled—and rightly so—that these measures were not accurate. An accurate and quick test, the Babcock centrifugal test, was not introduced until 1890.

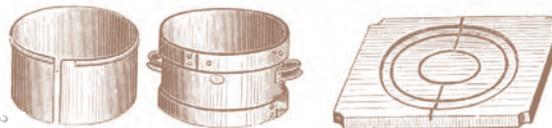
The Factory System also eliminated rural women from being primary participants in the dairy trade. Some farm women continued to churn for home consumption, but most dairy farmers sold their milk or cream to the factories, either retaining a small amount for home churning or purchasing butter from merchants. Thus, farming and dairying became a com-

mercial sphere open primarily only to men. Surplus poultry and egg production became one of the few remaining financial contributions that rural women were recognized for. Although women's roles in the spheres of gardening for home consumption, household chores, and child rearing were life sustaining, the effects of those aspects of "women's work" on the financial status of the farmstead were not so easily measured as butter income.



THE ACTUAL "RECIPES" FOR CHEESE OF HOME MANUFACTURE WERE VERY SIMPLE, SUCH AS DELAWARE COUNTY RESIDENT EMILY GILLESPIE'S 1867 RECIPE:

... milk warm, put in rennet enough to bring to a curd, then whey off till dry by cutting up or breaking & stirring the curd occasionally, then salt & put in press for a couple of hours; turn & put in press 3 or 4 hours, turn again & leave in press till time to put in another cheese (say about 24 hrs in press in all); then take out & grease in hot melted butter with red pepper in. change cloths every time the cheese is turned so as to have a dry one. Keep in an airy place & turn & grease every day till cured.³⁶



CHEESE-MAKING

Cheese-making, whether on a large or small scale, was an exacting process. Making cheese required hours of precise monitoring of temperatures during heating. After the cheeses were made, they had to be turned and greased with whey butter. If even one step was done improperly, the cheese would be inedible. Bad flavor in cheese was believed to be the result of a variety of factors, including unclean milk; cows under stresses such as abuse, drought or a poor diet; insufficient heating; overheating; not enough salt; too much salt; or putting the curds to press when too warm.³⁷

Early factory cheese-making followed the same recipes as home production. The basic steps in cheese-making were heating the milk, adding the coagulant, setting the curd, cutting the curd, heating it, draining and salting the curd, and finally, pressing it into a single mass of cheese and allowing it to age, usually for 30 to 45 days. Instead of a home cooking stove and small pans, commercial equipment took a grander scale to process larger and larger batches of milk into cheese.



Fig. 278.—CURING-HOUSE, WHITESBORO' CHEESE FACTORY.

*Illustration of the interior of a cheese factory curing house.*³⁸

In Jones County, two types of cheese were known to have been manufactured: full cream and skim milk. Skim cheeses were less rich, made from a by-product of butter production. However, most of the cheese made in Jones County was full-cream cheese, a variety of what is now commonly referred to as cheddar. Most cheeses were exceeding large, to be sold and sliced into smaller dimensions by merchants and grocers. A 22-inch diameter cheese typically weighed 120 pounds, cured.

The heyday of the early Iowa cheese industry extended from 1865 until around 1880; the success of the butter industry was longer-lasting. A 15-year success period for the cheese industry seems particularly short, especially when the costs of equipment and buildings erected specifically for processing cheese are considered. By 1885, all but one of the Jones County cheese factories had been subsumed into larger companies. By 1900, all of the

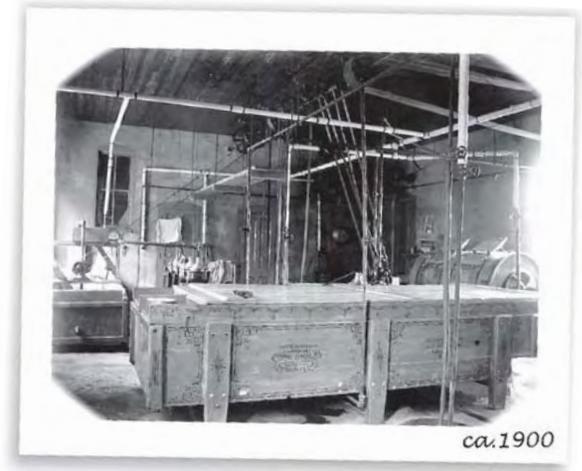
cheese factories had either failed or been converted into butter creameries. A variety of factors precipitated the decline of cheese factories, including Eastern demand for butter but not cheese, failure to invest large amounts of capital in improvements, greater perceived profits in butter, and lack of a nationwide marketing effort aimed at Iowa cheese.



RENNET WAS AN ESSENTIAL INGREDIENT IN EARLY CHEESE RECIPES. RENNET IS A DRIED EXTRACT MADE FROM THE INNER LINING OF A RUMINANT (CUD-CHEWING) STOMACH, USUALLY A CALF UNDER A WEEK OLD. THE FOLLOWING IS AN 1878 DESCRIPTION OF RENNET, WHICH CAN STILL BE PURCHASED TODAY IN TABLET-FORM IN LARGER GROCERY STORES:

It is not a pleasant looking object and its looks are better than its smell, which to inexperienced nostrils is abominable. The thing it most resembles is a bladder used in packing lard. It is tough, fibrous, translucent, and yellow...When the cheese-maker pours his rennet into the vat of milk, a quick and wonderful change takes place in the contents. The liquid thickens to the consistency of cream, and from the consistency of cream it assumes the appearance of a solid, which shrinks from the side of the vat and leaves a yellow whey in the seams.³⁹

Self-bandaging cheese hoops.⁴⁰



ca.1900

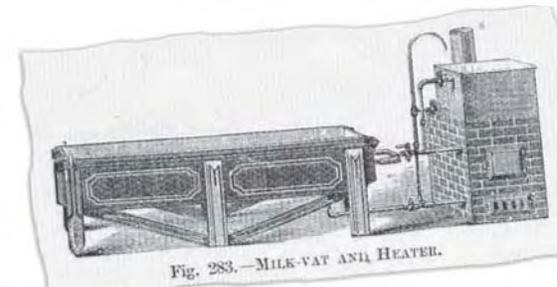


Fig. 283.—MILK-VAT AND HEATER.

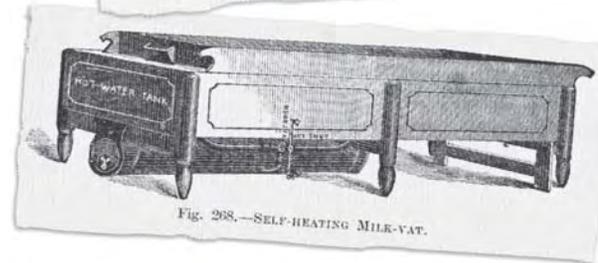


Fig. 268.—SELF-HEATING MILK-VAT.

Images of milk and Cheese vats.⁴¹ Photograph courtesy of the Minnesota Historical Society.

Gabriel Bernou separating curds and whey in Gentilly cheese factory, 1895. Courtesy of the Minnesota Historical Society Loc# HD7.3 p31 Neg# 17798.

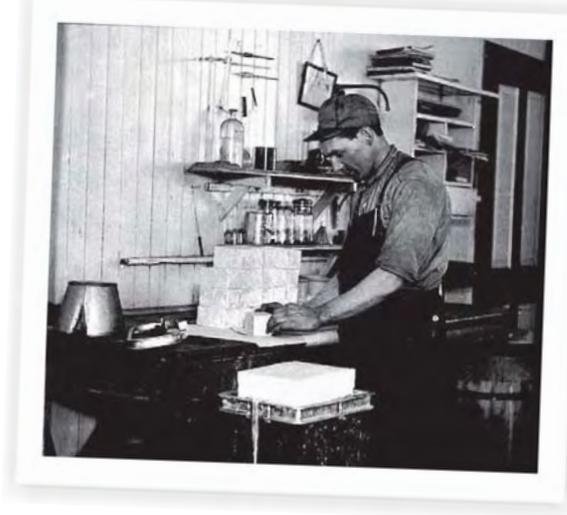


BUTTER-MAKING

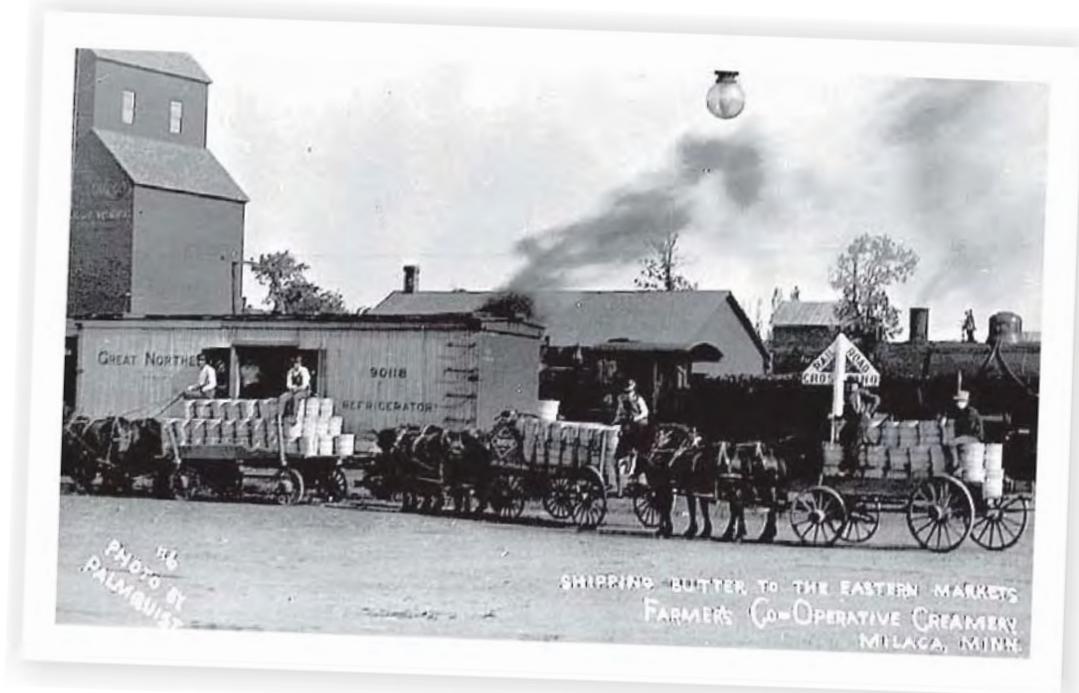
The early stimulus to local butter production was the arrival of butter dealers in the early 1860s. These individuals sampled products and arranged purchase of much of the following year's production on contract from individual farms, to be sold to Eastern buyers. Much as cheese-makers saw profitability in factory manufacture of cheese, so too did butter-makers. Unlike cheese, butter needed to be refrigerated for transport over any great distance. Rail cars known as "ice-boxes on wheels" were available in limited amounts starting in 1857. This situation rapidly improved with mass availability of refrigerated rail cars beginning by 1867.⁴²

The first creamery in Iowa was built in 1872 by John Stewart. Stewart is given much credit for legitimizing Iowa factory butter. He won several first place international awards for his butter in the 1870s, and was a savvy businessman: soon Eastern markets were clamoring for high-quality Iowa factory butter. There was no analogous proponent of Iowa cheese, and cheese was never in demand in the East like Iowa butter.

The basic steps in butter-making involved allowing the milk to cool, so the cream would rise to the top; the cream was skimmed off, and the cream was usually allowed to sour. Then, the cream was churned, washed, salted, and packaged. Factories employed steam-powered or horse-powered churns, with half-dash and hexagonal churns being especially popular.⁴³



Clockwise from top left: an unidentified creamery in Delaware County, Iowa, courtesy of the Delaware County Historical Society; packing butter, courtesy of the Minnesota Historical Society Loc# HD7.3 r16 Neg# 19851; and butter being shipped on a refrigerated rail compartment, ca. 1915, Palmquist, Minnesota Historical Society Loc# HD7.3 r9 Neg# 20416.



A LOOK AT ONE EARLY CREAMERY

At the Harlan Co-operative Creamery (Fayette County), which opened in 1878, farmers delivered their milk twice daily, dumping their milk into 2-x-4.5-foot handled pans which floated in a wooden vat full of water. Two "lads" (butter maker assistants) used a blind horse to power a water pump that cooled the milk, among other jobs. The butter maker arrived at work at 4 A.M. to skim the previous night's milk and wash the pans in preparation for the morning milk. After the morning milk had arrived, he usually rested from 10 A.M. until 4 P.M. In the late afternoon, he prepared for the evening delivery.⁴⁴

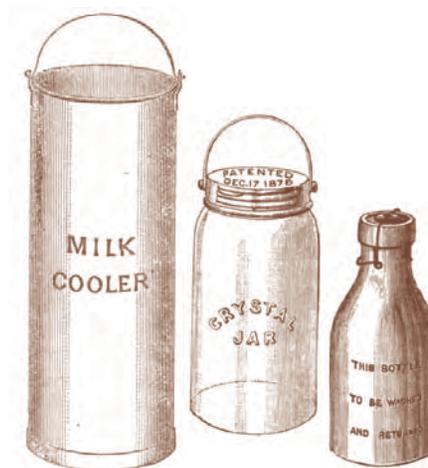
The Harlan Creamery, which went through a succession of name changes, replaced its "blind horse power" by 1882. An upright steam engine powered the pump and the churn. This creamery initially operated on the whole milk system. Long "shotgun" pails (coolers) were partially submerged in "pools made of cement filled each day with fresh water or oftener if the weather required." A long-handled dipper was used to skim the milk. The pails needed to be perfectly clean, so a steam hose was used to scald them. This was an unusual machine, probably invented by the butter maker. The scalding machine consisted of

a vat, deeper than a kitchen sink, fitted with a revolving rod with several brushes on the end, for washing cans. They were slipped over the brushes, and power was applied by means of a foot pedal. This method was successful and a patent was applied for, but by that time the cream separator sprang into use and methods of separating cream from milk were revolutionized.⁴⁵

The creamery purchased its first mechanical separator in the mid-1890s, roughly a decade after separators became commercially available.



Top: the Harlan Creamery. Bottom, left to right: butter tubs, milk cooler, and milk jars.⁴⁶



Rapid Changes in the Dairy Industry

As the dairy industry evolved and became more efficient, both the business and personal lives of farmers changed. Dairy farms were transformed from labor-intensive businesses to capital-intensive ones. Some changes were foisted upon farmers by the factories, and others were innovative solutions by farmers themselves. A few of the more profound changes are detailed here.



THE SILO

Today, a cow produces milk most of the year, and birthing is staggered so every herd has cows giving milk year-round. This practice was not the case until the arrival of silage (a.k.a., “green fodder,” usually made from chopped-up green corn stalks, clover, grasses, or a mixture of these), which keeps cows producing milk through the winter. Almost without exception before 1870 and in most cases before 1880, cows’ udders dried up during the winter months. Hence, the milking season lasted from mid-spring to late-fall. This fact is reflected in the earliest cheese and butter factories, which operated only seasonally.

Silos were introduced to Illinois in 1875 and to Iowa a few years later. These modern farm fixtures did not gain widespread acceptance until around the turn-of-the-last-century, as farmers worried the untried method would adversely affect animal health. Grain bins, which have been around for hundreds of years, required that the stored grain be dried to reduce spoilage. Silos, however, were air-tight and could preserve green fodder for a long period. The invention of silos would have profound implications for the life of every dairy farmer: a single technological advance (silos) meant the farmer would now have to milk his cows during the winter.



Library of Congress, Prints and Photographs Collection, FSA/OWI Collection. Top left silo: Arthur Rothstein, photographer, 1939. LC-USF34-029045D. Bottom silo: Russell Lee, photographer, 1936. LC-USF33-011091-M5.

THE CREAM SEPARATOR

For the first decade of eastern Iowa creamery operations, most facilities operated on the whole-milk system. Farmers delivered their milk once or twice daily to the factory, and returned home with the manufacturing by-products (whey or skim milk), which was fed to the livestock. As of 1881, all nine of the Diamond Creameries in Jones County operated on this system, as did all 40 creameries in Delaware County.⁴⁷

In the 1880s, a dairying revolution took place, termed by farmers as the New Departure—indicating a basic change in farm methodology.⁴⁸ This change involved creameries purchasing cream, instead of whole milk.

Gustav de Laval invented the high speed centrifugal cream separator in Sweden in 1878. The cream separator was introduced to Iowa in 1882 by Jeppe Slifsgaard, a Danish immigrant who operated the Fredsville Creamery in Grundy County.⁴⁹ Initially, only creameries could afford the machines. Within two decades, however, most dairy farmers owned a small-sized cream separator. In 1898, there were a reported 904 farm separators in Iowa; by 1905, there were more than 40,000.⁵⁰ Farm separators meant only the cream was taken to the factory, and farmers could feed the still-warm skim milk to their livestock, which was healthier as spoilage was less likely.



Farmer operating a cream separator at home. Russell Lee, photographer, 1941. LC-USF34-039721-D.

No only was the “practice” of agriculture changing, but the day-to-day social lives of farmers was drastically altered. After farm separators became popular, farmers no longer made the daily or twice daily trek to the factory to deliver milk. Instead the product was picked up by cream haulers. Although a few early creameries employed haulers to pick up milk from farms and deliver it to the factories,⁵¹ cream hauling was not a common practice until the 1890s or sometimes later. With the advent of the cream separator, haulers had less bulk to carry, and more and more creameries employed this method.

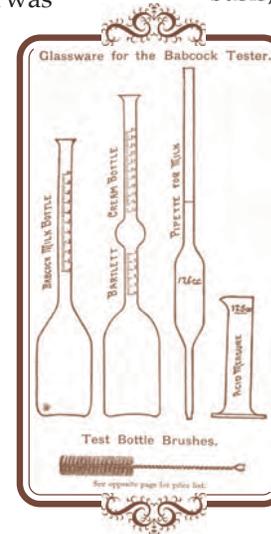
Cream haulers were a great convenience to the farmer and they had a profound impact on his life. Previously, a farmer would meet his agricultural colleagues every day at the factory as he took his milk there, usually right after the morning and early evening milking. Given the rigors of farm life, the delivery, however inconvenient, must have provided welcome relief from daily chores conducted in relative isolation and a chance to “catch up on the news” with neighbors. With cream hauling, the daily interaction of farmer-with-farmer became more and more infrequent and the haulers became the news carriers, spreading the latest information as they traveled from farm to farm.



BABCOCK BUTTERFAT TESTING

From the beginning of the creamery movement, farmers and factory operators had agitated for improved methods to measure the quality of milk --and later, cream --brought to the factory. Various instruments were used to measure the “quality of cream.” Most actually measured how much cream was in one farmer’s milk sample as compared to that of another farmer. A significantly lesser amount of cream as compared to the other farmers indicated that the sample had been diluted or some of the cream already skimmed off. These methods were far from precise; although more accurate tests existed, they were complicated, time-consuming, and little-used.

Stephan Babcock, a chemist and professor at the University of Wisconsin, developed a butterfat test that took only 10 minutes to complete. Babcock never patented the process, seeing the importance of releasing his findings to the dairying world, which he did in 1890. The Babcock method used centrifugal force to separate the sugar and casein from the fat. A sample of milk was placed in a glass test bottle along with small amount of acid, and the

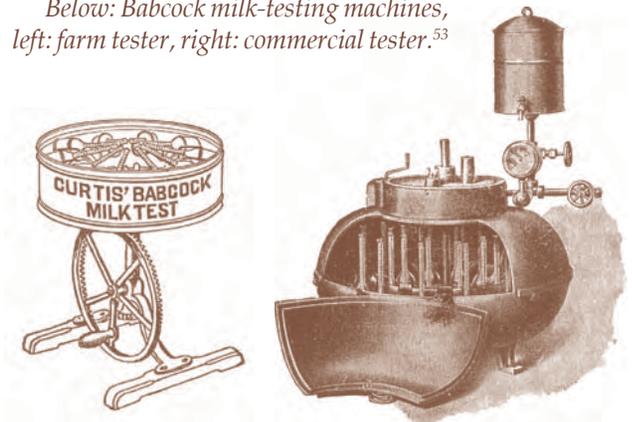


bottle and contents were spun on a simple machine. The fat would accumulate in the neck of the bottle. Graduated markings on the bottle neck provided an accurate measurement of butterfat content. It was recommended that, in addition to cheese and butter makers using this test, farmers should also test the milk of individual cows on a daily, weekly, or monthly basis, in order to cull the lesser producers from the herd.

Farmers may have believed the Babcock test was fair, but there was widespread belief until about 1900 that the test was often *conducted* unfairly. There are numerous references to patrons accusing the milk or cream testers of improprieties, namely, stating that the amount of butterfat per sample was less than the farmer believed it to be.⁵² Governmental and agricultural society publications advocated a strong educational program to ensure that farmers understood the scientific legitimacy of the Babcock test, in an effort to avoid these common conflicts.



Above: Babcock test bottles.
Below: Babcock milk-testing machines,
left: farm tester, right: commercial tester.⁵³



ADVANTAGES OF CREAM GATHERING OVER THE WHOLE MILK GRAVITY SYSTEM

Cream Separator

All of the cream separated out from the milk
Warm, freshly separated skim milk could be fed to livestock
Only the cream must be hauled to the factory
13-minute wait for cream to be separated

Gravity System

Up to 33 percent of butterfat lost
Farmer must transport cold, possibly spoiled skim milk back home from the factory
All of the milk must be hauled
24-hour wait for cream to rise naturally

IMPROVING THE BREEDS

The Babcock test meant that water could not be added to the milk without the factory discovering it; creameries began paying farmers not by the pound-weight of milk, but rather, by the percentage of butterfat in the milk. With milk grading—testing the butterfat percentage—in standard use, the farmer providing the cow's milk with the most butter (i.e., had the highest fat percentage) received greater payment than the farmer whose cows produced abundant quantities of less fatty milk. Farmers were forced to purchase full- or carefully selected mixed-blood breeds to increase milk output while simultaneously increasing the "richness" of the milk produced.

A few Jones County farmers adopted cattle breeding as a specialty during the early years of dairy industrialization. C. C. Walworth of Monticello was among their number, owning the 25th purebred Holstein in the United States, born on his farm in 1870. He was also the first Holstein breeder in Iowa.⁵⁴ In 1880, Bowen's Prairie farmer F. M. Hicks traveled to



Hick's Farm. Courtesy of State Historical Society of Iowa, Iowa City, Paul C. Juhl Collection.

Princeton, Illinois, to select six bulls of a "milking strain of blood" for his farm and those of five other dairymen, at a cost of nearly \$700.⁵⁵ Walworth and Hicks were definitely forerunners in herd improvement, as the real push toward this effort did not begin until the 1890 introduction of the Babcock test.

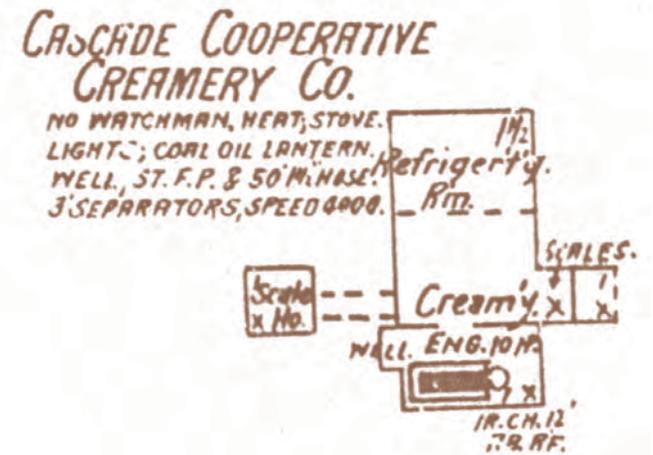


DAIRY CO-OPERATIVES

Generally, the more cream received by a single company, the lower the cost per pound to make the butter, due to lower shipping costs—as when filling an entire railroad car load; lesser fuel costs to fire boilers—as running a single boiler costs less than running ones at 20 different plants; and the ability of large factories to sell directly to retailers—thus avoiding middlemen costs. In other words, the more cream a company could receive, the lower the costs and greater the chance of success. The larger consolidated creameries began to purchase or drive out of business the smaller ones.

Centralized creameries were different than consolidated ones. Consolidated ones, such as the Diamond Creamery, owned numerous creameries within one-day's haul of each other; thus, cream could be received at the local branch creamery and hauled the same day to the central butter making facility. Centralized creameries were more common in Western Iowa, where dairy farms were more scattered; these creameries received a good portion of their cream from rail shipments from outlying branch creameries.

The earliest dairy co-ops were simple organizations formed to meet the marketing needs of dairy farmers who had nowhere to sell their milk. Co-operative creameries were not unusual in Iowa: the first was formed in 1877 in Delaware County, and by 1894, nearly 50 percent of Iowa's 807 creameries were co-



Fire insurance map of Cascade Cooperative Creamery Co., Iowa.⁵⁶

operatively owned. In a dairy co-op, a certain number of shares at a set amount per share were sold, generally to dairy farmers. Profits and losses were then split according to shareholding percentage and shareholders voted on any important decisions related to operations. A small percentage of the profits were used to invest in capital improvements.

The post-1900 co-operatives were more complex and often organized to counterbalance perceived inequities doled out by large consolidated creameries, such as poor service, marketing, and management; low prices paid for cream; improper butterfat testing; and excessive commission charges.⁵⁷ Co-ops were not simply a reaction against apparent abuses; farmers believed that community effort would result in economic success and empowerment.



OTHER CHANGES

Several other changes affected the early dairy industry. The Iowa Butter Exchange opened in 1884. Butter buyers from New York, San Francisco, Boston, and Chicago to name a few, gathered to purchase large quantities of manufactured dairy products at fluctuating prices. Previously, these trades either occurred on an individual basis, or through other established trade exchanges, such as in Chicago or Elgin, Illinois. As Eastern butter buyers became more influential over the Iowa dairy market, local economies began to reflect wider nationwide supply-and-demand trends, making the dairy industry susceptible to the very financial fluctuations the first cheese and butter factory patrons had hoped to avoid.⁵⁸

Several inventions had ramifications that are still felt in the industry today. Automatic vacuum milking machines were first patented in America in 1859, but were not perfected or accepted by dairymen for many decades until the arrival of the Mehring milk machine around 1890; even then, many farmers continued to hand-milk.⁵⁹ Commercial pasteurization machines were introduced in 1895, and became commonplace after 1910.⁶⁰

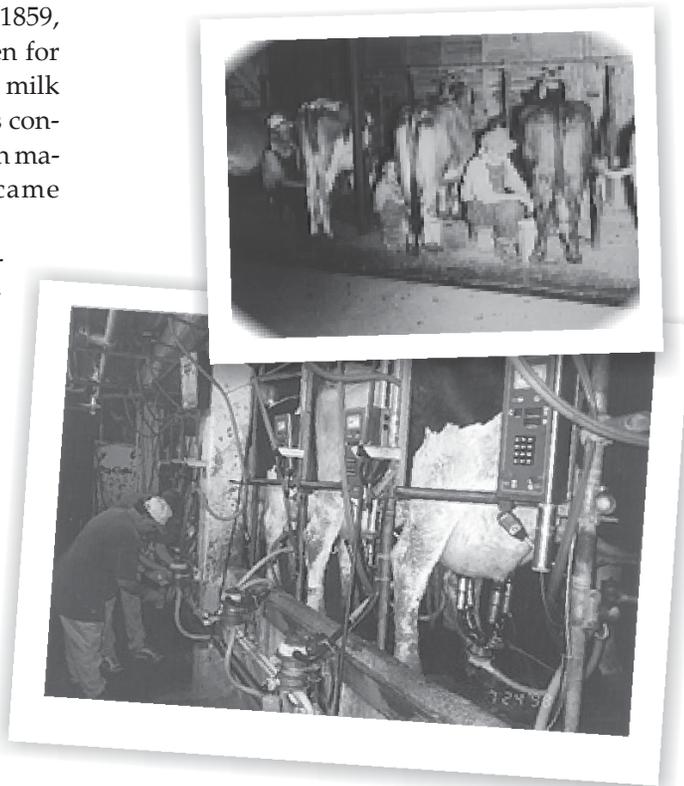
State and national dairy regulations, particularly regarding sanitary standards, played a driving role in how farms operated. The passage of the Meat Inspection Act in 1890 and its 1906 amendment authorized inspectors from the United States Department of Agriculture to enforce sanitation standards within the dairy industry, even on the individual farm level. Farms had to maintain certain standards of cleanliness, which often meant improving their barns to include concrete floors that could be easily washed-down.

Butter and cheese production expanded and changed the way the dairy business was conducted. By the 1890s, dairying was no

longer just a labor-intensive enterprise, requiring only the diligent farmer willing to consistently milk twice daily for a portion of the year and take his milk to the creamery. By the turn of the century, to be successful, the dairyman needed to purchase expensive machinery and maintain it; build silos and improve the sanitation levels of his barn; and expand and improve the quality of his herd. The industry was subject to governmental regulations and focused on efficiency, sanitation standards, breeding for higher milk pro-

Top: milking procedure during the early 1900s. Library of Congress, Prints and Photographs Collection, FSA/OWI Collection. No photographer, 1940. LC-USF34-07516-ZD.

Bottom: modern milking procedure. Courtesy of Department of Animal Science, Iowa State University.



duction, and book farming. Dairying had arisen to safeguard against crop failures, blights, and market fluctuations in an effort for farmers to turn a profit. As dairying became commercialized “eventually it became organized according to the same principles that governed crop and livestock markets, thus making it vulnerable to the very forces it had been designed to avoid.”⁶¹



94 CEDAR RAPIDS GAZETTE

J.G. CHERRY. TELEPHONE No. 132
 NOS. 258 & 260. SOUTH 5TH STREET, CEDAR RAPIDS, IA.
 MANUFACTURER AND DEALER IN

CREAMERY AND DAIRY SUPPLIES.

MANUFACTURER OF ALL KINDS OF TINWARE, ROOFING ETC., EGG CASES AND HAND MADE EGG-CASE FILERS.

LARD PAILS, POULTRY BOXES, BOXES OF ALL KINDS AND BOX MATERIALS. CORRESPONDENCE SOLICITED

CHERRY'S TEST CHURN AND CREAM CARRIERS.

1889 advertisement for dairying supplies in Cedar Rapids Gazette.⁶²

Early Jones County Dairy Industry Leaders

The production of cheese on a large-scale surplus basis in Jones County began around 1858. A few farmers and their families shifted from production-for-home-consumption to production-for-trade, which launched a period of economic growth that had significant consequences for the county and region. Soon, this home-made surplus production evolved into formal cheese factories that pooled together the milk resources of neighbor-patrons. Between 1864 and 1878, several cheese factories organized in Jones County.

Perhaps most remarkable about the earliest large-scale cheese producers in Jones County was that they all hailed from New York State, then the leading dairy producer in the country. Soon after, numerous men from Ohio also made their mark on the Iowa industry. The New York-Ohio-northeast Iowa migration route reflects farmers exploiting newly available and cheap dairy lands across the rapidly growing United States landscape. The interior front cover of this pamphlet depicts the top dairy producing regions of the United States in 1880.

Following on the heels of the cheese factory movement were butter factories, also known as creameries. The first in Iowa was John Stewart's 1872 Spring Branch Creamery, in neighboring Delaware County. Four years later, the first creamery in Jones County opened, and was an immediate success.

Although the list of prominent early dairymen is manifold, three men stand out in the dairy industry of Jones County. Asa C. Bowen was the proprietor of the first cheese factory in Jones County, and probably the State of Iowa. John Stewart, a Delaware County butter maker with business interests in Jones County, was almost single-handedly responsible for popularizing Iowa butter on the East Coast. Henry D. Sherman took the dairy industry to new heights,

A

SA BOWEN BUILT A CHEESE HOUSE WHICH WAS COMPLETED ON JUNE 1, 1863. THE FOLLOWING YEAR, HE BEGAN ACCEPTING MILK FROM SURROUNDING FARMERS. BOWEN PROVIDED THE FOLLOWING DESCRIPTION OF HIS FACTORY TO THE NEWSPAPER:

A building for a cheese house I completed this year, the first of June; size on the ground 20 by 40 feet, posts 10 feet high, built expressly for the dairy. Its position is north and south, and partitioned into two rooms, the north part twenty-eight feet for a curing room, and the south part for a work room, where the cheese is made. The apparatus in this room consists in a cheese vat, to hold the milk, in which the cheese is made, a press, sink, a five bladed (15 inch) curd knife for cutting the curd, thermometer, etc. The cheese vat is a great improvement in the dairy—labor saving, and of great utility. The tin vat of less size is placed in a water tight box, leaving a space all around it for holding water. A small copper furnace is attached with pipes connecting with the water, and the furnace is made to encase the water around the fire, and the water is thus heated and the curd scalded with a little fire in the furnace. A proper connection with pipes should conduct the whey from the vat to save all dipping and carrying it away. The press is Kendall's patent, made in New York, is a powerful press and is easily managed. A large sink containing a rack of slats is used for the final drainage of the curd, although it could be drained in the vat, that having a hinge leg at one end, it may be thrown out of a level with ease.⁶⁴

consolidating many smaller factories into the Diamond Creamery and becoming the first Dairy Commissioner of Iowa.



ASA BOWEN

New York native Asa C. Bowen settled on Bowen's Prairie and opened the first cheese factory in Jones County, and arguably, the State of Iowa. A "factory" is defined as an *organized* group of neighboring farmers, pooling their milk resources to manufacture a large quantity of dairy product.

In 1858, Bowen embarked on the surplus manu-

facture of cheese from the supply of his own dairy herd. By 1863, he was producing more than 10,000 pounds of cheese per year. Bowen was one of the few large-scale home producers of cheese in the county who made the transition to factory production. The following year, he began accepting the milk of his neighboring Bowen's Prairie farmers at his cheese house.⁶⁵

Asa Bowen utilized the Bowen Brothers' Store in Chicago, a well-known business of his brothers, to sell four tons of his "choice cheese." *The Chicago Post* proclaimed:

Judges who examined the article, pronounced it equal to the best samples from the celebrated dairies of Herkimer Co., New York...so far as we can learn, it is the first instance of an Iowa farmer [Asa

C. Bowen] attempting to produce an article of cheese in any considerable quantity that would compete with the celebrated cheese turned out by the Herkimer County dairymen...And as he has given the most convincing proof that the west can compete successfully with the Eastern dairies in making cheese, we hope to see many others follow his example, as there is no reason why our farmers should not be able to supply the entire West with cheese, instead of compelling our dealers to look to the Eastern dairies for a supply, as they are now doing.⁶⁵

At least three cheese factories were in operation in Iowa by 1866: at Bowen's Prairie, Muscatine, and Denmark (Lee County).⁶⁶ Later that year, Asa Bowen moved five miles north, closing his Jones County factory and opening a new one at Sand Spring, Delaware County. Bowen's former Jones County milk patrons were amongst those who supplied the milk of 400 to 500 cows to the Johnathan B. Ross Cheese Factory, which opened in 1867, less than one-half mile

from Bowen's old factory.

Additional cheese factories soon opened in Jones and surrounding counties. Most made full cream (cheddar-like) cheese, although at least two manufactured skim milk cheese, made from a by-product of butter production. In 1873, the Oneida Cheese Factory was built on Bowen's Prairie.⁶⁷ Selection of the name "Oneida" for this establishment indicates that Americans at the time recognized the idealized cheese heartland of the country to be in New York State (Oneida County). The Bowen's Prairie cheese makers clearly wanted their product linked to this region and selected the name intentionally—not necessarily to deceive East Coast buyers—but to distinguish the company from other "Iowa" cheese makers.

Most of the cheese factories in Jones County went through a boom-and bust-cycle in a short 15 years or less—a surprisingly short span of time—starting with the opening of the first cheese factory by Asa C. Bowen in 1864. Most of the smaller factories were converted to butter factories or subsumed by large

creameries by 1880.

Generally, the local downfall of the cheese industry is blamed upon greater profitability and lower costs associated with the butter industry, although the cheese factory demise was probably complicated by a number of factors. Iowa cheese never received the national acclaim of its sister product, Iowa butter. Similarly, known, large-scale contracts for Iowa cheese are never mentioned in the local newspapers, except for the early contracts Asa Bowen had with his family relations in Chicago. Without large amounts of capital, high revenues, or increasing product demand, expansion of individual factories could not occur. These small facilities could therefore not offer their milk patrons the returns of the large butter creameries. The single cheese factory that remained in the Jones County after 1885, the Wyoming Valley Cheese Factory near Onslow, probably operated on a small and seasonal scale until it closed around 1900.



BOWEN BROTHERS,
IMPORTERS, JOBBERS & PACKAGE DEALERS
 IN
Staple & Fancy Dry Goods, Domestic,
Yankee Notions, Crockery, China, Glass & c.
 72, 74 & 76 LAKE STREET,

Chicago, April 2 - 1863

Bowen Brothers advertisement.⁶⁸

Archaeology at a Cheese Factory and Creamery



Shipping stencil from site.

Excavations were conducted at archaeological Site 13JN168. The Oneida Cheese Factory was erected here in 1873 by Alfred Doxsee, an Ohio native. In order to survive as a business, this factory had to convert to butter-making by the mid-1880s. Around 1893, local farmers, mainly those of German and Luxembourg descent, renaming it the "Star Co-operative Creamery." The equipment was sold off, the buildings were moved off-site, and the land was converted to pasture in 1904.

*"Cooley can."*⁶⁹



Several "features" or building remnants were present below the surface of the plowed farm field here: the foundation of the main factory building (24-x-48-feet), a well, trash pits, and an outhouse pit. A drainage line (similar to modern, plastic drain line) was buried below the farm field and connected a wood-lined trough to a hog lot. The manufacturing waste (the whey) was dumped into the trough. The whey ran down the drain line and emptied into the hog lot, providing food for livestock kept immediately west of the factory.

Also present on the site was a milk cooling chamber, adjacent to the well. This chamber was not needed at cheese factories, and was built after the factory shifted to butter production. Water was pumped constantly into the limestone-lined pool. "Cooley cans" full of milk were set into the pool: the surrounding water cooled the milk quickly and cream rose faster this way. Once a mechanical separator arrived on site by 1893, this pool was no longer needed.

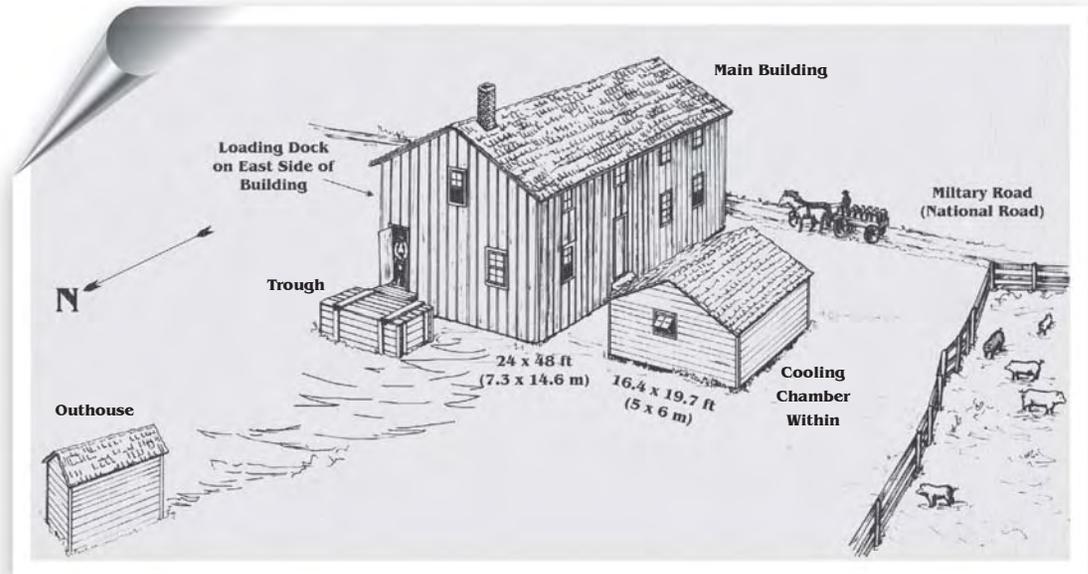
The Oneida Cheese Factory is the only cheese factory to receive extensive archaeological excavations in Iowa. Site 13JN168 reflects several trends discussed throughout this booklet, particularly the inability of the cheese industry to compete with the myriad advantages of butter production. Also, small creameries had great difficulty competing with larger operations. Finally, the short usage of the cooling chamber represents the rapidly changing technology of the dairy industry.

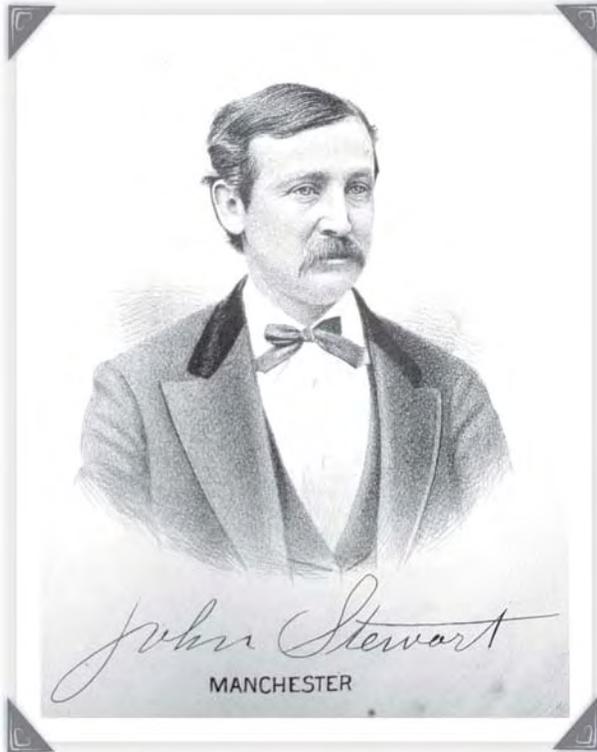
Site overview.



Trough at site 13JN168.

Reconstruction drawing of the creamery at site 13JN168.





Portrait of John Stewart.⁷⁰

JOHN STEWART

The early stimulus to local butter production was the arrival of butter dealers, who sampled product and then purchased much of the following year's production on contract from individual farmers and farmers' wives. In 1862, L. A. Loomis of Delaware County was the first local person known to sign one of these butter contracts, specifically to supply the boats of the Northwestern Packet Company. Loomis traveled the countryside, buying up home-made butter which he in turn shipped to the Packet Company. Others soon followed in his footsteps.⁷¹

Much as cheese-makers saw profitability in factory manufacture of cheese, so too did butter makers. The first creamery in Iowa was John Stewart's Spring

Spring Branch Creamery, probably John Stewart's second one, erected in 1877, 500 feet north of the first. Courtesy of the State Historical Society of Iowa, Iowa City.⁷²



Branch Creamery, built in Delaware County in 1872.

John Stewart was born in Ohio and served in the Union Army for four years during the Civil War. Prior to moving to Iowa, Stewart ran butter and cheese dealerships in Missouri and Illinois. He moved to Delaware County in 1870, where he practiced the same trade, diversifying to butter production in 1872.⁷³

Stewart is given much credit not only for operating the first creamery, but also for legitimizing the quality of Iowa factory butter. Stewart won several first place awards for his butter at competitions in St. Louis, and in 1876, he exhibited and marketed his butter at the Centennial Exposition in Philadelphia, where he won the International Gold Medal—an extraordinary honor that literally put Iowa butter on the global economic map. The Iowa butter industry was well-

served by a man who understood that rave reviews meant sales: Stewart's butter also won acclaim at London and New York exhibitions. Other Iowa butter makers began receiving national butter awards soon after—solidifying the Iowa butter image of superb quality. Iowa cheese, while improving in quality, did not receive similar accolades.

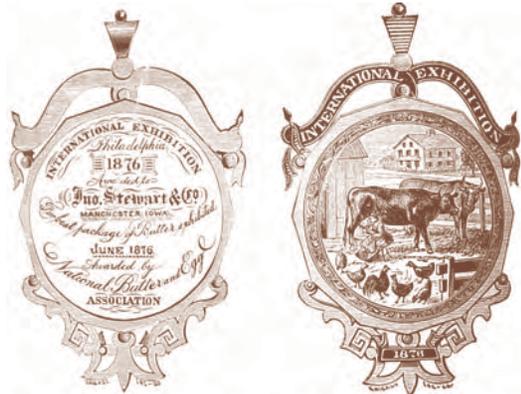
Stewart's creamery "system" consisted of buying the milk from farmers within a three-mile radius of his Spring Branch facility, and using the cream to make butter. By 1874, he had established other nearby creameries and additional Delaware County creameries quickly arose. Stewart moved to Anamosa in Jones County in 1878 or 1879, and by 1880, he owned or had an interest in creameries in Jones, Delaware, Linn, Cedar, Jackson, and Cherokee counties.⁷⁴ In 1889, Stewart left Jones County and began work at a Minnesota creamery.



Loomis' Butter dealership. Courtesy of the State Historical Society of Iowa, Iowa City.

John Stewart won the International first prize for his creamery butter at the 1876 Centennial Exposition in Philadelphia. He and other northeast Iowa dairymen subsequently won numerous other prizes for their high quality butter.⁷⁵

"THE N. Y. TRIBUNE EXCLAIMED, WHY, WHAT DOES THIS MEAN, THAT IOWA SHOULD TAKE THE FIRST PREMIUM AT THE WORLD'S FAIR? THAT BUTTER WHICH HAS BEEN SO LONG REPORTED AS WESTERN GREASE, SHOULD TAKE THE PREMIUM AS THE BEST BUTTER OF THE WORLD—HOW CAN IT BE POSSIBLE? THERE MUST BE FRAUD. THE COMMITTEE HAVE BEEN BRIBED. WHY, PEOPLE OF NEW YORK, WAKE UP! TO WHOM IS AWARDED THE RED RIBBON THIS TIME? JOHN STEWART, DELAWARE COUNTY, IOWA—WESTERN STATES—1879"⁷⁶



JNO. STEWART & CO.'S CENTENNIAL MEDAL. AWARDED FOR BEST BUTTER

HENRY D. SHERMAN

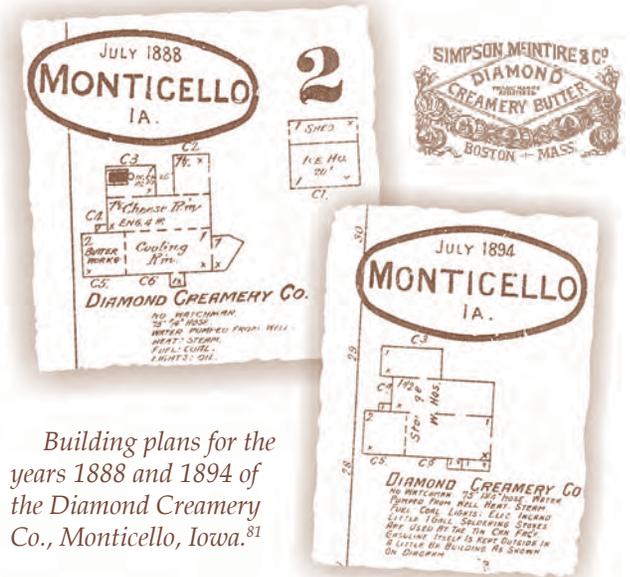
The first creamery in Jones County, the H. D. Sherman and Company Diamond Creamery, opened for business in 1876 in Monticello, four years after John Stewart opened the first Iowa creamery. Henry D. Sherman is perhaps the best known early dairyman in Jones County. Sherman was initially a schoolteacher, born in Indiana, who arrived in Jones County in 1859.

Sherman began his commercial dairy venture in 1863 as a butter buyer, shipping the locally-homemade product to Chicago. The butter tubs were marked with a "diamond" symbol. Simpson, McIntyre and Company of Boston sampled some of the Diamond butter in Chicago and visited Monticello to meet with Sherman. Soon, the company began purchasing most of his product and would continue to do so for many years.⁷⁷

In 1876, the Diamond Creamery opened in Monticello. In its first year of operation, the creamery processed "over one million pounds of milk," with a capacity of 10,000 pounds of milk per day, using a 60-gallon box churn. Only one year after opening the Diamond Creamery in Monticello, Sherman broke ground on another creamery, this one in Wayne Township.⁷⁸

In 1879, Henry Sherman and John Stewart pulled off an astounding feat: between the two men, Iowa made a clean sweep of all the top creamery butter prizes at the Second International Dairy Fair in New York.⁷⁹ Sherman was awarded the first place prize in two of the four nationwide creamery butter categories (butter made in June and made in September). Stewart won the other two categories (October and November): Iowa butter was the hallmark of quality.

At least between 1878 and 1880, Sherman manufactured skim cheese from his butter by-products.⁸⁰ This practice was not common among local butter makers. Besides his manufacture of skim cheese, Sher-



Building plans for the years 1888 and 1894 of the Diamond Creamery Co., Monticello, Iowa.⁸¹

man's company differed from other local creameries in another respect. The Diamond Creamery, starting in the late 1870s, tried to pay patrons based on the quality of their milk. At that time, quality (butterfat) measures were far from precise. Sherman had serious difficulties convincing his patrons that milk grading was fair.⁸² Not until the Babcock centrifugal test, introduced in 1890, was a truly reliable and quick method of milk fat testing found.

Most of the old cheese factories in Jones County were no longer producing cheese by 1880. Butter factories increased in number, although by that date harbingers of big-business consolidation were appearing. The largest creamery organization in the county, the Diamond Creamery, had begun to acquire numerous smaller operators. Generally, the Diamond Creamery purchased these operations and converted them to skim stations. Occasionally, the company purchased a small creamery, and immediately shut down the operation, as was the case with the Hall Creamery in Langworthy.⁸³ Thus, dairy farmers often had just a single place to market their milk unless they wished

to travel onerous distances. With less competition, the bigger companies could lower the price paid for milk. Farmers rebelled against these monopolies by forming their own creamery co-operatives around the turn-of-the-century. By 1887, Diamond Creameries had an interest in at least 27 creameries; most of these locations were probably skim stations.

Sherman sold out his share of the Diamond Creamery to Simpson, McIntyre and Company in 1884, but his involvement in the dairy industry was far from over. In 1886, he was appointed the first Dairy Commissioner of Iowa.⁸⁴ Sherman served in leadership positions in several dairy associations, including as President of the Northern Iowa Butter and Cheese Association, President of the Iowa Butter and Egg Association, President of the Iowa Dairymen Association, and Vice-President of the National Butter and Egg Association. Most of these associations arose in the 1870s and served to mass market products and distribute information about how to make farms and commercial dairies more profitable.



Milk advertisement. Courtesy of State Historical Society of Iowa, Iowa City.⁸⁵



Significance of Bowen's Prairie and Jones County to Iowa Dairy History as Expressed Through Surviving Structures and Places

Bowen's Prairie and Jones County played a significant role in the foundation and development of Iowa's dairy industry. Beginning in 1864, with Asa Bowen opening the county's first cheese factory at Bowen's Prairie, Jones County was at the forefront of the state's dairy industry. The statewide significance came largely through the efforts of Bowen, John Stewart, and Henry D. Sherman, whose individual contributions were also explored in the previous pages. However, while the history of Jones County dairying is documented in the historical accounts, census, and legal records, what is physically left of this industry in the county?

The greatest number of dairy-related resources still standing in Jones County is represented by the barns

that dot the landscape. Extant dairy barns span the late nineteenth to late twentieth centuries in construction and reflect the changing ideas about dairying and barn design through the years. Barns were not common until the 1870s, with the earliest dairy barns typically having a basement level where cows could be milked and manure easily removed. Hay and grain were stored in the upper level, where they could be thrown down or dropped by chute to the feed bunks below. These heavy timber frame buildings have foundations made of local limestone and are usually banked into the hilly terrain, with the open basement end usually facing to the east or south to take advantage of sunlight and to protect from the prevailing winds. A few barns built entirely of locally-quarried stone have been noted in the county.⁸⁶

The Ross Barn located in the Bowen's Prairie neighborhood, along what was historically the Military Road (now U.S. 151 in Jones County), was a two-level, gable-entry basement barn built c.1867 by Johnathan B. Ross.⁸⁷ He established a farmstead at this location next to the cheese factory that he had built in 1867. The cheese factory exists today only as an archaeological site (13JN211), with the barn recently torn down to make room for an expansion of the highway. Prior to its demolition, the Iowa Department of Transportation, in partial mitigation of the impact to this historic property, documented the barn through photographs, measured drawings, and historical research.⁸⁸

The Ross Barn measured 30 feet in width and 40 feet in length and was comparatively small in size to the average basement barn dimensions of 40 to 50 feet in width and 60 to 100 feet in length. The smaller size of the Ross Barn suggests that J.B. Ross was focusing more of his attention on his cheese factory operation than on his own dairy production, keeping his dairy herd size to a minimum. According to the 1870 U.S. Agricultural Census, Ross' livestock consisted of two horses and nine milk cows, with the farm producing corn, oats, and potatoes in addition to 150



South elevation of Ross Barn in January 2001.

pounds of butter and 350 pounds of cheese. This was not a large operation compared to other, much higher-producing farms in the township and represents a small-scaled dairy operation likely producing foodstuffs just for the Ross household.⁸⁹

The Ross Barn had a nearly two-foot thick foundation of limestone rubble construction. In places, the foundation had been reinforced later with concrete. The exterior of the barn was clad with vertical board-and-batten siding fastened with machine cut nails dating from the original construction of the barn. Wire nails in the siding reflected later repairs. The interior construction of the barn showed the use of both hand-hewn timbers and circular-sawn posts and beams. The bent configuration was a simple bent consisting of three vertical square posts (one center and two side posts) supporting a single horizontal "big beam." The vertical posts were sawn, while the big beam, the sill and rafter plates, and the tie-beams were hand-hewn. The rafters consisted of poles from which the bark had

been stripped. The floor planks varied from eight to ten inches thick, while the exterior siding consisted of boards one foot in width and one inch thick. An interesting detail on the underside of the floorboards was a hand-painted advertisement from the Ricklefs Store in Monticello, Iowa.

This general store and feed mill operation was in business from 1867 to 1899.⁹⁰

The floor plan of the Ross Barn was a single open room in later years; however, its original layout would have included a few milking stalls. The stalls were subsequently removed so that the basement could later serve as a cattle loafing and feed shed. The upper level showed loft levels for the storage of loose hay and bins for grain. A drop down hay mow door in the east gable end was a later addition for the loading of baled hay into the mow; however, earlier door openings likely aided in the winnowing of grain during threshing. An earthen ramp with limestone retaining walls led up to the upper gable entry door from the west.

The basement barn "marks the shift from a diversified agricultural economy to dairying." The multi-level barn had its roots in Europe but "is known best for its utilization in the barn designs of southeastern Pennsylvania."⁹¹ From there, this design diffused to the northeastern states and was subsequently trans-

planted to the Midwest by settlers from states such as New York and Pennsylvania. (J.B. Ross was one such settler, having migrated to Jones County from Herkimer County, New York, the same county from which the Asa Bowen family originated.) These barns were essentially one-level threshing barns raised up on a basement and were used for hay and grain storage on the upper levels and for the stabling of livestock including cows and horses in the basement level. Such a design was well-suited to dairying, and when the Midwestern agricultural economy shifted from wheat production to livestock raising and dairying, the raised barn design was adapted for this changing economy.

A second barn in the Bowen's Prairie neighborhood was also documented prior to its demolition to make way for the recent expansion of U.S. 151. This barn, known as the Craig/Allemand Barn, was located less than one mile to the east of the Ross Barn, and was built around the same time in the late 1860s-1870s. The original core of the Craig/Allemand Barn was not built for dairying and was a single-level, gabled-roofed heavy timber-framed barn used as a horse barn. However, it was later enlarged and adapted for use in a dairy and general farming operation. Its most recent use was for a hog shelter. The original barn measured only 28 by 40 feet and had a limestone foundation but no basement. The interior framing consisted of hand-hewn oak posts and beams. The ground level was used for livestock feeding and shelter, with loose hay storage in an overhead loft. The basic form of this barn had its origins in the single-level, three-bay threshing barn type. This was a common barn type in the Midwest in the mid- to late nineteenth century.⁹²

Studies of the Bowen's Prairie settlement area have noted the survival of a number of other barns of the same vintage as the Ross and Craig/Allemand barns, with most of fairly large size and consisting of banked, basement barns similar to the Ross Barn and used in the area's dairy industry. Additional surviving barns

in the Bowen's Prairie and Jones County area reflect the evolving dairy barn through the years as dairy operations became more sanitized and more mechanized into the twentieth century. These barns include gambrel roofed and Gothic Arched barns that allowed for more open space on the interior. These later barns included plank frame and masonry buildings, with tile block and concrete the favored materials of the early twentieth century. Inside the barn improvements included metal stanchions and mechanized feed and milking equipment.

Silos reflect changes in the dairy industry that recognized the value of improved livestock through the production of better, controlled feed and of year-round milking, which was made possible by silage. As a result, silos, built first of wood and then of concrete or tile block, became a common sight in Iowa's dairy region. Even later, the invention of the thermos-like Harvestore silo, having a glass-coated interior and fiberglass-bonded steel exterior, virtually eliminated silage spoilage.⁹³

Other buildings that reflect Bowen's Prairie and Jones County's changing roles in the dairy industry include milk houses, spring houses, cheese factories and creameries, skim stations, and milk plants. However, the survival of these resources as standing buildings is rare, except for the later factories. There is at least one known early limestone spring house still standing in the Bowen's Prairie settlement area on a farmstead in Section 18 of Richland Township. Spring houses are often built of stone and shelter a flowing spring at its source, with water allowed to either flood the floor or is channeled into open troughs around the interior of the structure. While initially built to protect the spring as a clean water source, spring houses were also used to store perishables and to cool milk during the separating process of home dairy production. The size of the spring house when used in dairy production would depend upon the number of cows being milked. Milk when first drawn from the cow has a temperature of about 90 degrees Fahrenheit and

Craig/Allemand Barn looking to the northwest in September 2000. Original section of barn consists of the SE corner in the foreground.

needs to be properly cooled to inhibit bacterial growth. The milk is poured into deep pans, which are then lowered into the water, with the milk cooling to a desired temperature around 58 degrees Fahrenheit. The cream rises to the top and is skimmed off and placed in deep containers in the spring house until it is ready to churn into butter. The skim milk would have been fed to the livestock.⁹⁴

As dairy farm operations grew, and in response to both commercial standards and later government regulations, milk cooling moved out of the spring house and into specially built milk houses. These buildings are small in size and built of wood, concrete, or tile block, with the use of concrete and tile block in later milk houses reflecting increased sanitation standards in the dairy industry. The milk house contains a cooling tank, washing facilities, and storage space for milk cans.⁹⁵ Typical milk houses seen in Iowa are gable roofed and sited very near the dairy barn or attached directly to that building by an enclosed walkway. Milk houses enjoy a better survival rate on the eastern Iowa landscape because of their more recent construction and continued dairy production into the present day. Spring houses, on the other hand, are rare in their survival because they serve no useful purpose on the



modern farmstead.

Commercial dairy production began to supplant home production between the late 1860s and the 1870s, with the construction of creameries and cheese factories booming in the late nineteenth century. These early factory buildings were typically of frame construction and susceptible to fire. Proximity to a good water source, either a spring or well, was required as well as a location close enough to a creek or pond where ice could be gathered in the winter. An example of this is the J.S. Condit Creamery in Anamosa where the building was sited next to Davidson Creek, with the ice house located in the end of the building nearest the creek. The actual water source for the creamery was provided by a dug well. (The Sanborn Map Company's 1899 fire insurance map of the Condit Creamery noted that the creek went dry in the summertime.)

Because of their wood construction, most of the earliest creameries and cheese factories have not



THE ROSS CHEESE FACTORY



The Ross Cheese Factory certainly caught the attention of the local newspaper, the *Monticello Express*, which printed several articles about the new factory. On June 23, 1866, the newspaper reported that:

J.B. Ross, of Bowen's Prairie, has completed negotiations with F.M. Hicks for the land upon which to erect a cheese factory and will proceed to put up a five thousand dollar establishment between this [date] and spring. Although this is a private enterprise, the factory will be for the use of the neighborhood. It is to be modeled after the New York cheese factories, which have been in successful operation for years.

By February 21, 1867, the newspaper noted:

Mr. Ross of Bowens Prairie, informes [sic] us that the Cheese Factory projected last year is to be built near Frank Hick's residence this spring. It will be 26 by 100 feet; two stories high and will have the capacity of using the milk from 400 to 500 cows. Mr. Ross expects to be ready to commence the manufacture of cheese by the 20th of May.

By August 8, 1867, the factory was fully operational, with a reporter from the *Express* paying a visit to the establishment:

On Friday last, we visited the Bowen's Prairie Cheese Factory and found it a much larger establishment than we had supposed it to be. Mr. Ross, the gentlemanly proprietor, conducted us through the building and cheerfully gave us all the desired information, pertaining to the manner in which they manufacture cheese. The building is twenty-six by one hundred feet, two stories high, and is substantially built. The lower story contains two rooms, besides the engine room and office, which are additions to the main building. The second story will be used exclusively for a curing room.

The factory is pleasantly located, about seventy-five yards from the main road, near the residence of F.M. Hicks, and presents both inside and out an appearance as neat and tidy as an old maid's band box. The establishment is furnished with the best and most improved machinery, and the operators are practical men who understand their business thoroughly. They are now using the milk from one hundred and fifty cows, and turn out nearly four hundred pounds of cheese per day.⁹⁶

survived into the present day except as archaeology sites, such as the remains of the Ross Cheese Factory (13JN211) and the Oneida Cheese Factory (13JN168) in the Bowen's Prairie neighborhood of Jones County. The non-extant Crescent Creamery in the Jones County town of Langworthy provides an example of a typical "whole milk" creamery from the early period. Built in February 1879, this creamery was touted that same year as a "model" creamery.⁹⁷ It was typical for the era being of frame construction and two stories in height. It measured 26 by 54 feet and had a substantial stone foundation. It also had a "solid stone and cement floor which is six inches lower in the center than at the sides and slopes to the rear of the building." Over the cement floor was a plank floor built so "that all water, sour milk, or other liquids spilled upon the floor [ran] through to the cement floor below" where the liquid drained off.⁹⁸

A well with a pump supplied fresh water, and an ice house provided the cooling agent. A receiving room contained a Fairbanks scale to weigh the milk as it arrived. There were two milk cooling vats set into the cement, which were supplied with cool water through elevated tanks and pipes. The milk was cooled in tin pans set into the cooling vats, with each pan having a faucet through which skim milk would drain once the cream had risen to the top; a process that took about 36 to 48 hours. The cream was then churned for butter, with a steam engine supplying the operation's power. The upper story of the building served as living space for the creamery foreman and his family. In 1879, this creamery received milk from 600 area cows and produced nearly 400 pounds of butter from 12,000 pounds of milk received daily. The rail line in nearby Monticello transported the butter to New York and Philadelphia markets. The Crescent Creamery later passed into the hands of S.W. Merrill and was later absorbed by the Diamond Creamery Company of Monticello. In 1888, the Crescent Creamery burned to the ground and was replaced by a skim house built by the Diamond Creamery Company.⁹⁹

The Diamond Creamery in Monticello was a much more significant operation in Jones County. It was built in 1875 by Henry D. Sherman, with the Diamond Creamery Company eventually operating other creameries and cheese factories in the county including the Ross Cheese Factory. The Diamond Creamery was the first commercial creamery built in Jones County and was reportedly the second built in the state. (The first creamery was the Spring Branch Creamery built in 1872 by John Stewart and his partner, Matthew Van Deusen, near Manchester, Iowa, in Delaware County.) The Diamond Creamery expanded in 1877, adding steam power. In 1878, the company began manufacturing skim milk cheese, with the butter now vacuum-packed in tin containers. Diamond Creamery butter was renowned and was distributed to an international market. It was also supplied to the U.S. Army and Navy for a number of years. The creamery was expanded again in 1881 with an infusion of capital from Simpson, McIntyre & Co. of Boston, Massachusetts, who had an interest in the Diamond Creamery from its inception. By 1887, the company had 27 creameries under its control. Some of these outlying creameries were converted to skim stations at which the milk was received from the farmer and the cream separated for shipment to the main plant in Monticello to be manufactured into butter. When hand separators became common on local farms in the early 1900s, cream routes were established, with the cream collected at the farms, hauled to a shipping point, and delivered in refrigerated railroad cars to the central plant in Monticello. The Diamond Creamery Company incorporated in 1907; however, the creamery came to an abrupt end in 1915 when the main building burned to the ground. It was not rebuilt, although the Farmers Mutual Creamery Company had a large plant built in 1897 in Monticello that continued to operate until 1967.¹⁰⁰

Built of wood, the two-story Diamond Creamery housed a tin shop on the second floor where the butter tins were cut and manufactured. The main floor

housed the weigh room, separators, the cream room, and the main office. The basement was used for packaging and the final sealing of the butter tins.

There was also a large vat room which was heated with steam, a runway and loading chute, boiler rooms, and a well and pump located just off the main building. Nearby stood the ice house and in back of that a cold storage plant.¹⁰¹

According to the 1893 plat book for Jones County, there were then at least 44 creameries in operation including two in Cascade just over the county line. Of the 44 creameries, two were labeled as cheese factories, with the remainder labeled as creameries. Every town and small settlement in the county boasted of its own creamery, although many of them were being operated by the Diamond Creamery Company of Monticello. The north half of the county had 64% of the creameries, with nine clustered along the old Military Road between Anamosa and Cascade.

As the dairy industry moved into the twentieth century, mechanization and new sanitation standards resulted in the replacement of most of the older creamery buildings with masonry buildings. Until the mid-twentieth century, nearly every community in northeast and north-central Iowa had its own creamery co-operative. Around the turn of the century, creameries were so prevalent that in the dairying region of the state each county had several, located in towns as well as rural townships, and in many instances the neighborhood creamery served as the community's post office and general store as well. By the 1960s, the change in how farmers marketed their dairy products sparked consolidation among the state's



Diamond Creamery at its peak. Courtesy of State Historical Society of Iowa, Iowa City.

creameries. The introduction of bulk tanks enabled farmers to ship their milk long distances, and large centralized processing plants began to displace the neighborhood creamery.¹⁰²

The early twentieth century creamery buildings were more fire-proof than the old wood buildings but they also provided a more sanitary and sterile environment in which to manufacture butter, cheese, and other milk products, such as ice cream. These new buildings were typically one-story in height and were built of brick, tile, or concrete blocks. Designs included simple utilitarian types with little stylistic influence, while others reflected popular architectural styles of the day such as Craftsman and Bungalow. Because of their masonry construction and adaptability to other uses, these second-generation creamery buildings have survived in greater numbers across the Iowa landscape. At least five of these buildings are present in Jones County alone including creameries

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- ⁶ Steve Meyer, "Staceyville produces millions of pounds of milk each year," *Waterloo-Cedar Falls Courier*, July 4 (2004); Pinkham, pp. 13, 32, 36, 61, 67.
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- ¹¹ *Ibid.*, W.S. LaGrange, "Iowa's Dairy Foods Processing Industry," (Ames: ISU Extension, 1995), p. 1. Accessed July 26, 2004, from: <http://www.extension.iastate.edu/Pages/dairy/report95/sections.html>; Don Nelson et al., "Iowa's Changing Dairy Industry," *Wallaces Farmer* 89 (21 March 1964), pp. 25, 88.
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- ¹⁵ *Ibid.*, p. 88.
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- ¹⁷ *Ibid.*; LaGrange, p. 1; Dale Thoreson, Field Specialist, Butler County ISU Extension Office, personal communication with Clare Kernek, August 6, 2004.
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Valuable assistance to this project was provided by the following:

Lowell Soike and Berry Bennett, State Historical Society of Iowa, Des Moines

Mary Bennett, Archives, State Historical Society of Iowa, Iowa City

Tanya Zanish-Belcher and Michele Christian, Special Collections Department and University Archives, Iowa State University, Ames

Dale Thoreson, Field Specialist, Butler County ISU Extension Office

Randall Faber, Iowa Department of Transportation, Ames

Jan Olive Nash and Adam Meseke, Tallgrass Historians L.C., Iowa City

Joe Anderson, Ames, Iowa



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Dairy Timeline

- 1846 Iowa becomes a state; farm women produce butter and cheese for home consumption and sell surplus to local merchants.
- 1858 Large-scale home production of cheese is mentioned in northeast Iowan newspapers; surplus sold to merchants.
- 1862 Butter dealers begin collecting home-made butter from farm wives and selling it on contract to Eastern buyers.
- 1863 Asa C. Bowen of Jones County sells four tons of his home-made cheese to his brothers' store in Chicago. Henry D. Sherman becomes a Jones County butter dealer.
- 1864 Asa C. Bowen begins to receive milk from neighboring farmers to process into cheese—probably the first cheese factory in Iowa.
- 1866 Other cheese factories open locally.
- 1870 C.C. Walworth of Monticello becomes the first Holstein breeder in Iowa.
- 1872 John Stewart opens the first creamery in Iowa: the Spring Branch Creamery in Delaware County.
- 1876 John Stewart wins the International Award for the best butter at the Philadelphia Centennial Exposition. Henry D. Sherman opens the Diamond Creamery in Monticello, Jones County.
- 1878 The last, new cheese factory opens in Jones County. The greatest number open during any one year was about eight Jones County cheese factories.
- 1879 The butter from the separate creameries of Stewart and Sherman sweep all four top creamery butter awards at the International Dairy Fair in New York.
- 1880 A few local creameries in the area begin to operate year-round, due to the addition of ensilage (green fodder) to cows' diets.
- 1882 A cream separator is first used in Iowa, at the Fredsville Creamery in Grundy County.
- 1884 Sherman sells his share of the Diamond Creamery to a Boston firm. The Iowa Butter Exchange opens, providing Eastern buyers with a convenience locale to purchase butter on contract.
- 1885 Only one cheese factory remains in operation in Jones County.
- 1886 Sherman appointed the first Dairy Commissioner of Iowa.
- 1887 Diamond Creameries holds an interest in 27 creameries.
- 1890 The Babcock Centrifugal Test is released to the dairying world, providing a quick, accurate butterfat measuring method. The Meat Inspection Act passes, paving the way for sanitation inspections of dairy farms and factories.
- 1895 Commercial pasteurization machines introduced.
- 1911 Butter sculpture promotion sponsored by Beatrice Creamery Company becomes an Iowa State Fair fixture.
- 1936 Innovative milking parlor added to the ISU College Dairy Farm was among the first in the state.
- 1940s-1950s ISU Dairy introduces use of artificial insemination in cows in 1945, installs a bulk tank in 1955, and installs a glass pipeline in 1956.
- 1950s-1960s Cooperative creameries begin consolidating into larger creameries, while the butter industry began a steady decline. Change from farm-separated cream to whole milk delivered to dairy plants in bulk tanks trucks becomes common practice. Cured cheese manufacturing industry expands in Iowa.
- late 1990s Northeast Iowa loses 18 dairy plants.
- 2000 Dairy laboratory sponsored by the Northeast Iowa Community-Based Dairy Foundation, North Iowa Community College, and ISU built near Calmar, Iowa. Value added strategies help to grow the state's dairy industry in the first years of the 21st century.
- 2003 ISU campus dairy closed in 2003 due to cutbacks in state funding.

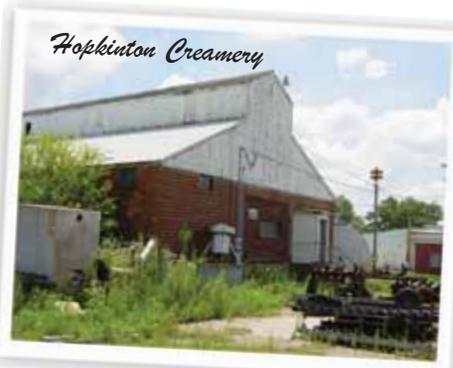


Amber Creamery



**Extant
Creameries
in Jones
County
and
Environs**

Hopkinton Creamery

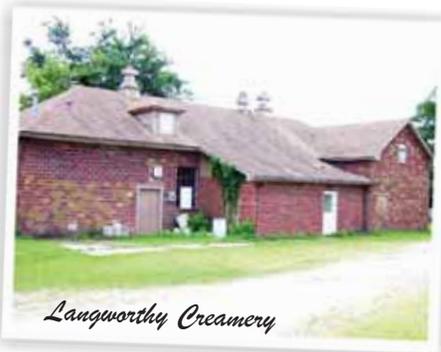


*Separating curd from
the whey resulting in
curd cubes. Cheese
manufacturing plant
at Goldfield, May
1960. Courtesy of
Iowa State University
Library|Special
Collections Depart-
ment.*



*Photograph staged to show all stages
of early cheese production from
separation to packing. Courtesy of
Iowa State University Library|
Special Collections Department.*

Langworthy Creamery



Scotch Grove Creamery



Anamosa Creamery



*Butter boxes. From Iowa Heritage
Illustrated, Summer 2001.*



