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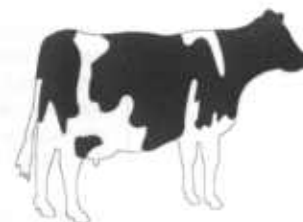
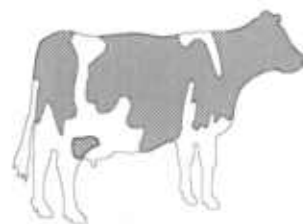
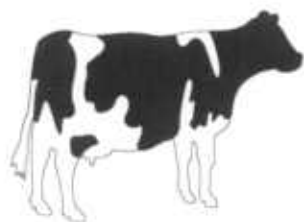
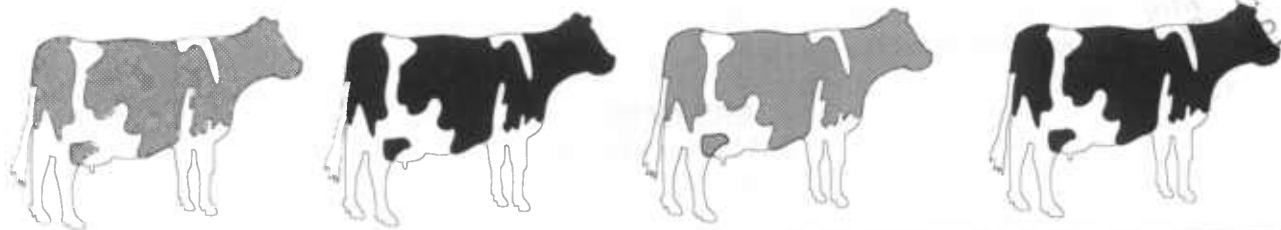
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Landmarks in the U.S. Dairy Industry

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Abstract

Studying history is useful for understanding many facets of today's dairy industry—including its structure, performance, and relationship to the rest of the U.S. agricultural complex. The landmarks in this history of the U.S. dairy industry have been defined in three categories: 1) those related to milk production and handling on the farm, 2) key events in the processing, manufacturing, and distribution (marketing) of milk and dairy products, and 3) public dairy policy events. The industry's past development shapes ongoing dairy industry issues today.

Keywords: chronology, dairy, milk production, milk processing, manufacturing, and distribution, public policy

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Landmarks in the U.S. Dairy Industry

Mark R. Weimar and Don P. Blayney

Introduction

Agricultural development in the United States has been amply studied by historians and economists, but most often in a general context. The development of particular agricultural commodity industries has been studied in a more fragmented way--analysts focus on either a very specific product or commodity, or a particular time-frame is detailed. Beginning with chronological studies of agriculture in general and augmenting them with industry-specific material, we can compose a chronology of the dairy industry in the United States.

Milk production and the dairy business in the United States have an interesting and varied history. The appeal of a chronology is clear: Tracking various developments over time helps explain the current state of the dairy industry. Those developments have shaped the present, and will shape the future of the industry and issues related to it. A problem in identifying chronological events is important to note before continuing: It can be difficult to pin down an event to one discrete date. As historians and other interested parties look back over recorded history, it is likely that different points in time might be defined as the time a particular event took place. When information or news did not travel instantaneously or as widely as today, there may well have been events taking place no one knew about.

The transformation of butter production from an onfarm activity to a factory activity is an example. The fundamental question is "When did this transformation begin?" There are at least four periods or points in time that have been offered as the answer: the 1840's (Manchester, 1983), 1856 (Smith and Roth, 1990), 1861 (Smith

and Roth, 1990), and 1871 (Eckles, Combs, and Macy, 1936). Which of the four is "right"? Probably all of them. In times when information did not move at the speed it does today, factory butter production could have been taking place with few people even knowing about it.

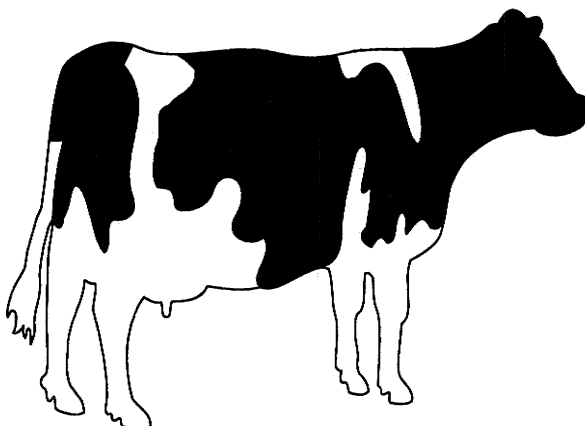
Events in the history of the U.S. dairy industry can be categorized in at least three major areas: those important to onfarm milk production and handling; those related to the processing, manufacturing, and distribution (marketing) sector; and public dairy policy events. Other events that do not readily fit any of the three categories are likely to occur. Placing an event in a particular category does not preclude the possibility of spillover effects in another. Policy events most likely will have effects throughout the industry. Not only have we identified significant events influencing the dairy industry, but we have also endeavored to add why they are important. The intent was not to produce an exhaustive history of the U.S. dairy industry. It was, and is, to stimulate discussion of the industry's development and show how that development shapes ongoing dairy industry issues.

There have always been, and will always be, a few individual producers, processors, or manufacturers who readily adopt new technologies or adapt to economic or other changes. These were the pioneers. It is not until widespread adoption or adaptation occurs that the industry shows change or that change becomes noticed. Identifying discrete events that have affected the dairy industry gives an appreciation for the sometimes long periods between the two.

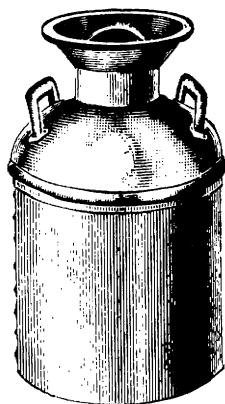
Onfarm Milk Production and Handling

Columbus is reported to have brought various farm animals, including calves, and plants to the New World in 1493. Our focus on the events related to onfarm milk production begins with the first successful European settlement in what was to become the United States, the Jamestown, Virginia, colony. In fact, the oldest European settlement was built in St. Augustine, Florida, in 1565. The Spanish had probably brought cows to their settlements in Mexico somewhat earlier.

1611	Cows arrive for the Jamestown Colony. (Ensminger)	1810	"Associated" or cooperative dairying had its start in Goshen, Connecticut, with the manufacturing and marketing of butter. (Samuels and Abrahamsen)	1857	Alfalfa acclimated to Minnesota. (Edwards and Russell)
1624	Cows reach Plymouth Colony. (Ensminger)			1860	Two German scientists developed the Weende system for analyzing feeds. This system, known in the United States as "proximate analysis," is still the most widely used method for evaluating feedstuffs. (McCullough, 1991)
1760-95	Period of pioneering livestock breeding work by Robert Bakewell in England laid the foundation for genetic improvements in dairy cattle breeds of those following his work. (Eckles, Anthony, and Palmer)	1817	The first Jersey cattle were reportedly imported into the United States. (Graves and Fohrman)	1861	Mechanical refrigeration technology was improved. These developments would eventually lead to utilization of bulk tanks for onfarm milk storage. (Ensminger)
1780	Research into artificial insemination began in Italy. (Ensminger; Trager)	1822	Earliest reported import of Ayrshire cattle into the United States, in the Northeast. (Graves and Fohrman)	1861	First imports of Holstein-Friesians that were not mixed with local cows. (Beal and Bakken)
1795	Reports of imports of large-sized black and white cattle into the United States was mentioned by historians. (Graves and Fohrman)	1830-31	First importations of Guernsey cattle into the United States. (Graves and Fohrman)	1865	Colvin patented first vacuum-type milking machine. (Ensminger)
1801-2	The first ice refrigerator (icebox) was invented and patented (in 1802) by Thomas Moore, a Maryland farmer. (Anderson; Trager)	1847	Near present-day Salt Lake City, Utah, the Mormons begin using techniques that are the foundation of modern irrigated agriculture in the Western United States. (Thorne)	1868	Formation of the American Jersey Cattle Club. (Graves and Fohrman)
		1850-56	Alfalfa grown on the West Coast. (Hendry)	1869	Brown Swiss first imported into the United States. (Graves and Fohrman)
				1870	DNA is discovered but not yet suspected as the genetic agent for conveying hereditary traits. (Trager)



- 1875** First wide publicity of silos constructed on farms in Maryland and Michigan. (Eckles, Anthony, and Palmer)
- 1875** Ayrshire Breeders' Association organized in the United States. (Graves and Fohrman)
- 1877** Foundation of the American Guernsey Cattle Club. (Graves and Fohrman)
- 1879** A formalized study of veterinary medicine (education) began at Iowa State College. (Stange)
- 1880** Brown Swiss Breeders' Association was established in the United States. (Graves and Fohrman)
- 1882** The bacteria causing dairy cattle tuberculosis was isolated. (Dorset)
- 1883** Publication of *The Jersey Bulletin* began. (Schlebecker and Hopkins)
- 1884** Veterinary education began at the University of Pennsylvania. (*History of the School ...*)
- 1885** A major dairy industry publication, *Hoard's Dairyman*, was founded. (Schlebecker)
- 1885** Pulsator (used in milking machines) was patented by Modestus Cushman. (Ensminger)
- 1885** Consolidation of Holstein (1871) and Friesian (1879) breed registries at the Holstein-Friesian Association of America. (Graves and Fohrman)



- 1890** The Babcock test was developed. The test allowed a quick, easy, and accurate test for milkfat content of milk, and thus, provided for milk to be priced on a basis other than "white water" weight. Other tests were developed but none were as widely used as the original Babcock test. (Eckles, Combs, and Macy)
- 1891** The first dairy school in America was established at University of Wisconsin. (*Wisconsin*)
- 1892** The first successful gasoline tractor was built by John Fruehlich. The tractor led to changes in the use of labor, which changed the organization and operations of all farms, including those with significant dairy cow herds. (Gray)
- 1892** Mehring milking machine powered by foot or hand pedals began to gain acceptance. (Ensminger)
- 1892-93** Certified milk originated by Dr. Henry L. Coit in Essex County, New Jersey. Certification meant that raw milk produced on the farm met some established set of sanitary standards. (Bartlett; Beal and Bakken)
- 1893-94** First production of certified milk. (Bartlett; Beal and Bakken)
- 1898** With the introduction in 1898 of *Feeds and Feeding*, a publication of the Wisconsin Agricultural Experiment Station, producers had a book that helped them improve the nutrition of their herds. They could provide the levels of protein, fiber, and energy to sustain cows at maximum production. (Morrison)
- 1903** Alexander Gillies, an Australian, produced the first prototype of what eventually became the modern milking machine. (Ensminger)
- 1905** The first dairy cow testing association was organized in Newaygo County, Michigan. (Eckles, Anthony, and Palmer)
- 1906** First known rural electric line was constructed in Hood River, Oregon. (Cavert)
- 1908** First cooperative bull association, in Michigan. (Winkjer)
- 1910** The onfarm electric power market was discussed at a meeting of the National Electric Light Association. (Schermerhorn)
- 1920** There were 55,000 milking machines on 5 million farms with dairy cows. Few farms had refrigeration. (USDA, BAE, 1950)
- 1920-30's** Universal method of hauling milk to market in the 1920's and 1930's was in 40-quart cans. (Manchester, 1983)

1927	The American Dairy Science Association instituted the Dairy Herd Improvement Associations (formerly the cow-testing associations) and established a Dairy Records Committee to review and revise rules for milk production testing on a regular basis. (Ensminger; King)	1930's	Late in the 1930's, bulk tank handling of milk was introduced in California. Later, this would replace handling milk in 40-quart cans. (Manchester, 1983) Ensminger dates first bulk tanks to 1938. Possibly the first reported research on total mixed rations at Purina Milling Company farms. Urea partially replaces protein in cattle rations. Mixing rations with other protein sources, such as soybean meal, was also tested and ultimately developed. (McCullough, 1991; Wisconsin)	1944	685,000 milking machines on 4.5 million farms with dairy cows. (USDA, BAE, 1950)
1928	Penicillin was discovered in London. (Stodola)			1946	336 AI associations with 73,000 members in operation. The members owned about 900 bulls and 579,500 cows. (Phillips)
1929	The Great Depression began. (Bean)			1940's	By the late 1940's, a new, so-called "fast milking procedure" had cut milking time in half. (USDA, BAE, 1950)
1930	58 percent of all farms had cars, 34 percent had telephones, and 13 percent had electricity. (Smith and Roth)	1937	Russian scientists demonstrate a milk production response in lactating dairy cows to injections of a crude pituitary gland extract originally named somatotropin. (Bauman)	1950	Large proportion of commercial dairy farms had refrigeration on farms. (USDA, BAE, 1950)
1930	Over 70 percent of farms had milk cows but only 14 percent of farms with dairy cows were considered commercial dairy farms. Commercial dairy farms were those that earned 40 percent of their receipts from dairying. (Manchester, 1983)	1938	The first dairy cattle artificial-breeding (AI) cooperative was organized. (Shaffer)	1951	First embryo transplant in cattle. (Wisconsin)
1935	Sulfanomides (sulfa drugs) were discovered. (Jones, L.)	1939	Improvements in storage of bull semen laid the cornerstone for artificial dairy breeding. (Wisconsin)	1950's	Linear programming combined with the <i>Feeds and Feeding</i> rations helped dairy producers minimize the costs of their rations. (Katzman) Increased use of antibiotics and sulfa drugs sped recovery of cows suffering from mastitis and other diseases, and thus increased milk production per cow. (Petersen)
1936	Artificial insemination of dairy cattle in the United States was begun. (Ensminger)	1939	AI gaining adherents. There were 6 associations with 646 members owning 33 bulls and about 7,500 cows. (Ensminger; Phillips)	1952	British scientists reported successful freezing of certain animal semen, which retained a high degree of fertility after thawing. (Ensminger)
1936	14 percent of the dairy farms in the Northeast and 29 percent in the Lake States used milking machines --with the remaining cows milked by hand. About 13 percent of the dairy farms in the Northeast were cooling milk with electricity; fewer than 1 percent were cooling milk with electricity in the Lake States. (Manchester, 1983)	1940	33 percent of all farms had electricity; 58 percent had cars and 25 percent had telephones. (Smith and Roth)	1953	Computer programming developed for Dairy Herd Improvement work. (Wisconsin)
1936	The Rural Electrification Administration (REA) was approved. (Ellis)	1943	Production of penicillin increased dramatically through use of lactose-corn steep liquor medium. (Raper)	1957	The herringbone milking parlor was brought to the United States from New Zealand. (Hienton and Schaenzer) Over time, milk stanchions were replaced by walk-through and herringbone milking parlors. (McCroskey and others)

	Milking machines were changed from bucket milkers to dump station to pipeline. (McCroskey and others)			demonstration farms and is making its way onto other commercial farms. (Houghton)	
1960's	Cubing or wafering machines revolutionized hay handling. (Butler)	1978	The first recombinant DNA product, human insulin, was produced. The U.S. Food and Drug Administration (FDA) approved its use in 1982. (Trager)	With deregulation of the railroads, the unit-train concept became economically viable and was used to ship feedgrains to the West Coast. Bulk buying in this manner increased milk production in the West and helped to fuel productivity growth in California. (Dooley)	
1960's	Cooperative Extension Service or feed companies provided easy access to least-cost rations from mainframe computers. (Ensminger)	1980's	With the introduction of the personal computer (PC), farmers could mix much more sophisticated rations that minimized cost directly on the farm, without help from feed stores and Extension. (Ensminger)		
1964	By 1964, 92 percent of producers in Iowa, Illinois, Missouri, and Wisconsin were using bulk tanks rather than cans. (McCroskey and others)		Milking frequency begins to change from 2-a-day (2X) to 3X (even 4X has been tried), although slowly. The increases in milk production from more-than-twice-daily milking have been known since the 1930's and 1940's. Economics will play a crucial role in such conversions. (Borton and others; Petersen; Smith, Knoblauch, and Putnam).	1981	A way was discovered to mature and fertilize eggs of cattle in vitro. (Wisconsin)
1968	Official acceptance of electronic testing for milkfat content. (Wisconsin)		Computerized feeding systems allowed for introduction of total mixed rations, which were designed to provide more precise mixes of feed directly to the cow. There can be economic benefits to adopting such systems. (Wildhaber, Willett, and Hillers)	1982	First herd trials using recombinant bovine somatotropin (rbST) were conducted at Cornell. Other tests followed in several different locations. (Bauman)
1972	Development of somatic cell count procedure for use in cattle mastitis programs. (Wisconsin)			1984	The FDA ruled that milk and meat from cows given supplemental doses of rbST were safe for human consumption. The decision was based on data provided by sponsoring companies and other investigators. Safety of the milk and meat is only one of the safety criteria the products must meet prior to approval for commercial sale. (Sechan)
1970's	In the 1970's, only 0.4 hour of labor was used to produce a hundredweight of milk and 1.5 hours of labor were required to produce a ton of hay, compared with 3.4 hours and 9.5 hours, respectively, in the 1930's. (Manchester, 1983)			1984	Onfarm ultrafiltration technology was first used on a commercial dairy operation. (Hoard's Dairyman, October 10, 1985)
1976	Development of technique to transfer embryos in cattle nonsurgically. (Wisconsin)		A new system for evaluating feeds, developed by Van Soest at Cornell, gains usage. This system provides a more disaggregated measure of feed contents than the Weende system--information useful as nutritional requirements of the dairy cow become more fully known. (McCullough, 1986)	1993	The FDA approves Monsanto's rbST product for commercial sale. However, a 90-day moratorium on sales went into effect, beginning on the day of the approval, November 5, 1993. (Schwartz)
1977	60 percent of dairy cows/heifers were bred by artificial insemination. Used to some degree in 90 percent of U.S. herds. (Ensminger)				
1978	Only 13 percent of farms had dairy cows, and 50 percent of those were commercial farms. (Manchester, 1983)		Development of robotic milking technology ("automated milking systems") in Europe by Dutch firms begun in 1985. Some of the technology has been used on		

Processing, Manufacturing, and Distribution

The processing, manufacturing, and marketing of milk and dairy products did not become commercialized until the middle and late 1800's. The separation of raw milk production and milk and dairy product distribution activities led to the rise of intermediaries between dairy farmers and consumers. It also contributed to the organization of farmer cooperatives whose major goal was to give milk producers more bargaining power over milk prices.

1819 The tin can was introduced to America. While not so important for the dairy industry, the development and introduction of new packaging and containers gained a boost. (National Canners Association)

1834 Jacob Perkins developed the principle of mechanical refrigeration. (Beal and Bakken)

1841 Fuchs discovered that milk contained microorganisms, a finding emphasizing the importance of bacteriology to the industry. (Petersen)

1842 The first shipment of milk by rail into New York City proved successful and was continued. Milk had been moving by rail into the Boston market for some years before. (Larson; Manchester, 1983)

1851 Butter was moved successfully by rail in refrigerator cars from northern New York to Boston. (Smith and Roth)

1851 The first cooperative cheese factory was organized in Oneida County, New York. (Beal and Bakken; Bartlett; Manchester, 1983)

1851 A patent for mechanical refrigeration was issued to John Gorrie. Refrigeration technology began to improve during the 1860's and onward. (Dossat; Ensminger)

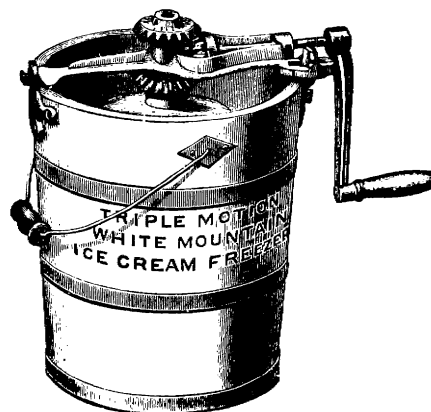
1851 The ice cream industry began when a Baltimore milk dealer, Jacob Fussell, began utilizing surplus sweet cream to produce ice cream on a large scale. (Turnbow, Tracy, and Raffetto)

1855 Dry milk was first commercially manufactured in England by Grimwade. (Eckles, Combs, and Macy)

1856 The first butter factory was established by W.R. Woodhull near Campbell Hall, New York. (Guthrie)

1856 A patent for condensing milk was issued to Gail Borden and a short-lived factory was built in Wolcottville, Connecticut. (Eckles, Combs, and Macy)

1856 Louis Pasteur began experiments with pasteurization. (Manchester, 1983)



1857 Pasteur announced discovery that heating postpones milk souring. (Wisconsin)

1857 Refrigerated railroad cars were developed, making possible broader distribution of dairy products. (Wisconsin)

1857 A second condensery was built by Gail Borden at Burrville, Connecticut. It failed, but led to the establishment of the New York Condensed Milk Co. in Wassaic, New York, the forerunner of Borden's Condensed Milk Co. (Eckles, Combs, and Macy)

1861 New York State Cheesemakers Association organized. Later it became the American Dairymen's Association. (Brunger)

1861 A creamery (or butter factory) was built by Alanson Slaughter in Orange County, New York. Cheese was also produced at the facility. (Eckles, Combs, and Macy)

1860-70 Substantial product modifications were apparent in the dairy industry as cheese moved toward factory production and sweetened condensed milk products were improved. (Williams and others)

1868 William Davis received a patent for a refrigerator car widely used by railroads in the 1870's. (Reynolds)

1871 A creamery exclusively for butter manufacture was built by Stewart in Manchester, Iowa. (Eckles, Combs, and Macy)

1871 A major board of trade for the dairy industry was established in Little Falls, New York. (Wisconsin)

1872 A patent was issued to Percy in New York City for the process of atomizing fluids into heated air. (Eckles, Combs, and Macy)

1872 The Elgin (Illinois) Board of Trade was organized to find a better method of marketing dairy products. (Ashmen)

1872 Trading in butter began on the New York Mercantile Exchange. (USDA, AMS, SB-633)

1878 The continuous, centrifugal cream separator was invented, simultaneously by de Laval, and Winstrop and Nielsen. It was brought to the United States in 1882. (Edwards; Petersen)

1879 The first Plymouth dairy board was established in Plymouth, Wisconsin. (Miller)

1879 There is some difference of opinion as to the originator of the ice cream soda, but credit has been given to Fred Sanders of Detroit, Michigan. (Turnbow, Tracy, and Raffetto)

1880-90 Substantial growth in creamery (factory) production of butter. (Williams and others)



1883 The first attempt was made to manufacture a dry milk product (malted milk) in the United States. (Eckles, Combs, and Macy)

1884 The Milk Producers' Union was organized to protect the interests of the producer, but it failed for lack of cohesiveness among members. (Dyson)

1884 Evaporated milk was patented by John Meyerberg. (Eckles, Combs, and Macy)

1884 The returnable quart milk bottle was introduced. (Manchester, 1983)

1885 The first factory to produce evaporated milk was operating in Highland, Illinois. (Eckles, Combs, and Macy)

1886 Automatic capping and filling equipment for quart milk bottles was patented. (Manchester, 1983)

1886 Introduction of classified pricing plan for milk in Boston market. (Manchester, 1983)

1890 The Babcock test was developed. The test allowed a quick, easy, and accurate test for milkfat content of milk, and

thus, provided for milk to be priced on a basis other than "white water" weight. Other tests were developed but none were as widely used as the original Babcock test. (Eckles, Combs, and Macy)

1890 The ice cream sundae was invented. (Wisconsin)

1894 The Five States Milk Producers' Association was organized to speak for producers but it disappeared after 5 years. (Dyson)

1895 Commercial milk pasteurizing machines were introduced. (Manchester, 1983)

1897 The cold-curing procedure for cheese was described. (Wisconsin)

1898 Chicago Butter and Egg Board organized. A major function of the Board was grading butter and eggs. (Irwin)

1900-10 Substantial product modifications were apparent: milk pasteurization, the production of ice cream for wholesale, and evaporated milk. (Williams and others)

1901 Stauf, a German, was issued a patent for an improved drying process for milk, which was bought by the Merrill-Soule Company of Syracuse, New York. This patent expired in 1918. (Eckles, Combs, and Macy)

1902 Milk wagon drivers' unions, the oldest in the industry, first organized in San Francisco and Chicago markets. (Bartlett)

- 1903** Discovery of galactase, an enzyme thought to play a major role in the ripening of cheese, by H.L. Russell. (Eckles, Combs, and Macy)
- 1904** The first ice cream cone was supposedly introduced at the St. Louis World's Fair. Also the year the first commercially produced cones were made. (Turnbow, Tracy, and Raffetto)
- 1905** The first milk-drying plant was built in Fayetteville, New York. (Petersen)
- 1906** The single-service (smaller, disposable, usually a single serving size) paper container was patented. (Manchester, 1983)
- 1907** Incorporation of the Dairymen's League in New Jersey as a business stock company. Little activity until the years during World War I. Became Dairymen's League Cooperative Association, Inc., in 1919. (Dyson)
- 1909** The rules of the Plymouth dairy board were changed so that it became a statewide entity, the Plymouth Central Cheese Board, the forerunner of the Wisconsin Cheese Exchange, which in turn became the National Cheese Exchange. (Miller)
- 1911** Automatic rotary bottle filler and capper perfected. (*Wisconsin*)
- 1914** Tank trucks first used for transporting milk. (*Wisconsin*)
- 1915** National Dairy Council founded. (*Wisconsin*)
- 1915** Construction of refrigerated warehouses was begun on a large scale, particularly in the meatpacking industry. Meatpacking companies were major suppliers of butter and cheese for years. (Mixon and Johnson; Nicholls)
- 1916** National Milk Producers Federation (NMPF) was formed. The term Cooperative was added to the name in 1923 (NCMPF). (McKay)
- 1916** The Chicago Milk Producers Association was the first group to organize a boycott of milk dealers. (Guth)
- 1916** Milk strike in the New York City market was organized by the Dairymen's League against Borden's and Sheffield Dairies, the major milk purchasers, processors, and distributors in the market. (Dillon; Dyson)
- 1917** The Elgin Board of Trade was discontinued under orders from the U.S. Food Administration. It was argued that the board was essentially a Chicago trading organization. A few traders from Chicago would travel to Elgin for a short Saturday session held in the form of a call board. (Nicholls, Feb. 1939)
- 1918-27** Packaged butter became more widely available. (Williams and others)
- 1918** The quantity of butter produced in creameries in the United States exceeded, for the first time, the quantity produced on farms. (Nicholls, Feb. 1939)
- 1919** Chicago Mercantile Exchange organized as a nonprofit organization. (Kolb)
- 1919** Homogenized milk was sold successfully in Torrington, Connecticut. (*Wisconsin*)
- 1920-30** Substantial product developments related to sweet cream butter. There was a move by major butter producers to improve butter quality during the period. Sweet cream butter was promoted as a "better" product. (Williams and others; Nicholls, Feb. 1939)
- 1921-26** Processed cheese became a more widely known and available product. (Nicholls, June 1939)
- 1921** The Minnesota Cooperative Creameries Association, the predecessor of Land O' Lakes, was established. (Nicholls, Feb. 1939)



- 1922** Insulated milk tank trucks became a more common sight on U.S. roadways. (Lough)
- 1923** The National Dairy Products Corporation was organized. It was merged with Kraft in 1930 and became dominant in cheese production (through patent control), merger activities, and marketing. (Manchester, 1983)
- 1924-30** Production point grading of butter became common. (Williams and others)
- 1924** Milk in nine large U.S. cities was 98 percent pasteurized, but small municipalities had no regulations on pasteurization. (Manchester, 1983)
- 1925** Stop-and-go horse-driven milk wagons were beginning to be replaced by step-and-drive milk trucks. (*Wisconsin*)
- 1925** Nonfat dry milk manufacturing using spray processing was developed to a greater extent. (Williams and others)
- 1926** The Pure Milk Association (PMA) was chartered in Illinois to serve fluid milk producers in the Chicago market. Prior to this time, seven such groups came and went for various reasons. The PMA was closely associated with actions related to the tuberculin-testing program instituted in the Chicago market. (Winn)
- 1929** Milk strike of 1929 in the Chicago market, lasting 18 days, called by the PMA. Dealers refused the price demands of farmers represented by the group. (Winn)
- 1929** The Great Depression began. (Bean)



- 1930-50** High-temperature, short-time, continuous flow pasteurization replaced vat pasteurization. (Manchester, 1983; USDA, BAE, 1950)
- 1930** The continuous ice cream freezer was introduced. (USDA, BAE, 1950)
- 1932** The Wisconsin Cooperative Milk Pool was incorporated. (Hoglund)
- 1932** Milk with vitamin D added was made commercially available to Detroit consumers by Borden Company. (*Wisconsin*)
- 1933** Fluid milk was included in army rations. (*Wisconsin*)
- 1934** The PMA strikes in the Chicago market after cancellation of the Federal milk marketing agreement and license, the first that had been granted in the United States. (Winn)
- 1936** More than 75 percent of milk in cities of 25,000 or larger was pasteurized. (Manchester, 1983)
- 1936** The Dairy Farmers Union was founded in Heuvelton, New York. From the beginning, this group proposed to bargain

collectively with dealers over prices. A major opposition group was the Dairymen's League Cooperative Association. (Dyson)

- 1938** An antitrust suit was brought by the Department of Justice against milk dealers, the milk wagon drivers' union, the Pure Milk Association, and others in the Chicago market. It was perhaps the most significant legal controversy in the industry until that time. The U.S. Supreme Court defined the points of law involved but no trial was ever held. In 1940, a consent decree was entered by the major defendants named in the complaint. (USDL; Winn)
- 1939** Dairy Farmers Union staged one of the most successful milk strikes in U.S. history, claiming to have cut off 50 percent of New York City's milk supply by the third day (lasted 9 days). (Dyson)
- 1940's** Construction of nonfat dry milk plants by the Federal Government during the Second World War resulted in value for the nonfat skim solids in milk. The domestic casein (the major milk protein) industry virtually collapsed. Implementation of the dairy price support program

by the 1949 Agricultural Act essentially guaranteed the continued lack of any significant domestic casein production. (Manchester, 1983)

1940 The American Dairy Association was formed. (*Wisconsin*)

1941 The Farmers Union of the New York Milkshed, a spin-off of the Dairy Farmers Union, was organized. Eventually it became the Northeast Division of the National Farmers Union from 1944 to 1951. (Dyson)

1941 The United Dairy Farmers of Michigan was organized in District 50 of the United Mine Workers of America (UMW), headed by John L. Lewis. In 1942, Lewis met with the United Dairy Farmers to propose a plan to organize the Nation's 3 million dairymen. The same year, the Dairy Farmers Union in New York formalized its affiliation with District 50. UMW impacts on dairy farmers were minimal. (Dyson)

1940-50 Homogenized and Vitamin D-fortified milk products gained acceptance, as did ice milk. (Williams and others)

1944 A method was developed for making cheddar cheese from pasteurized milk. (*Wisconsin*)

1945-55 Substantial soft frozen product and rindless block cheese developments occurred. The packaging of cheese for retail sale was also increasing. (Williams and others)

1946 Vacuum pasteurization was perfected. (*Wisconsin*)

1948 Ultrahigh-temperature (UHT) pasteurization was introduced. National recognition of UHT



milk did not grow until 1981. (*Wisconsin*)

1948 Plastic-coated paper milk cartons were introduced for commercial use. (*Wisconsin*)

1950's Work began on using reverse osmosis (RO) technology for purifying seawater. RO development has had implications for other filtration processes for removing water from milk and has itself been discussed as being applicable in the dairy industry. (Fleming and Hamm)

1950 A National Conference of Interstate Milk Shipments was established to assist in establishing and interpreting grading of milk moving across State boundaries. This conference makes recommendations for changes in the Pasteurized Milk Ordinance, the instrument by which rules are enforced. (Sauber, 1991; Jones, W.)

1950 Milk vending machines became a more important distribution outlet. (*Wisconsin*)

1950-60 Sliced cheese becomes a more important product as cheese companies respond to changing consumer wants. (Williams and others)

1952-56 Modified, low-fat milk products were more common in the markets. (Williams and others)

1955- Substantial impacts were apparent in the general automation of manufacturing and fluid milk processing. (Williams and others)

Changing marketing channels for fluid milk led to fewer fluid processors of greater size. Greater size tends to provide economies of scale or lower cost per unit of product. (Manchester, 1983)

The development of paper containers, clean-in-place systems, stackers and destackers, high-temperature short-time pasteurization, bottle-casing equipment, palletizers, and conveyors all helped to make fluid bottlers larger and more efficient. (Manchester, 1983)

Over time, increased efficiency and productivity in the fluid milk processing sector increased the derived demand for fluid products. (Gruebele)

- 1955-60** Substantial product developments were apparent in instant nonfat dry milk. (Williams and others)
- 1955** Flavor control equipment for milk is introduced. (*Wisconsin*)
- 1960-70** Many small cooperatives merged into large regional milk cooperatives. AMPI, Mid-Am, and Dairymen, Inc., for example, were all organized during the period. (Knutson)
- 1960-** Substantial product development was made using sterile milk. (Williams and others)
- 1963** Development of process for making frozen concentrated dairy starter cultures. (*Wisconsin*)
- 1964** The plastic milk container was introduced commercially. (*Wisconsin*)

1965- Substantial technological effects were apparent in butter (the continuous churn) and cheese (continuous processes) production, including techniques to assure taste. (Williams and others)

- 1968-69** Midwestern chainstores were using central purchasing plans, which meant fluid processors had to change their operations. (Fallert)
- 1968** Official acceptance of electronic testing for milkfat content. (*Wisconsin*)
- 1969** Dairy Research, Inc., was formed. (*Wisconsin*)
- 1970** By 1970, only 27 percent of milk was home-delivered, whereas in 1940, 70 percent of milk was home-delivered. (Manchester, 1983)
- 1970-75** Central milk purchasing programs were found to be important in southern food chains. (Lough and Fallert)
- 1971** The United Dairy Industry Association was formed. (*Wisconsin*)

1971 Rules of the Cheese Exchange modified eliminating State of origin requirements for cheese offered for sale or bid. Became National Cheese Exchange, the only open cheese market in the United States, operating in Green Bay, Wisconsin. (Gould)

- 1974** Nutrition labeling of fluid milk products began. (*Wisconsin*)
- 1976** Establishment of the Cheese Research Institute. (*Wisconsin*)
- 1978** Development of polyurethane foam from whey may provide a viable economic use for whey, which had been viewed as a waste product. (*Wisconsin*)
- 1979** Development of a milk concentrate, using ultrafiltration and electrodialysis. Ultrafiltration, in particular, is important for whey manufacture. (*Wisconsin*)
- 1979** Butter trading was discontinued on the New York Mercantile Exchange after 107 years. Along with the establishment of the National Cheese Exchange, the national scope of manufactured dairy product markets was recognized. (USDA, AMS, SB-633)



- 1983** The National Dairy Promotion and Research Board was authorized by the 1983 Dairy and Tobacco Adjustment Act. Promotion and research activities were to be paid for by a nonrefundable assessment of 15 cents per hundredweight on milk marketings. (Fallert and others)
- 1993** Futures trading of nonfat dry milk and cheddar cheese began on the New York Coffee, Sugar, and Cocoa Exchange. (CSCE)

Public Policy

Public dairy policy in the United States is closely identified with the economic history of the industry. While Federal dairy policies have often received the most attention, there are a significant number of State policies as well. Four eras of the economic history of the U.S. dairy industry have been identified (Novakovic, 1992): 1) Small-scale competition (late 1700's-1880), 2) Price domination by dealers (circa 1880-1916), 3) Collective bargaining (circa 1916-1933), and 4) Public regulation (circa 1933-present).

Most of the current major public dairy policies stem from legislation enacted since 1933, but several important public policy decisions prior to 1933 have had important effects on the industry. Many of the major public policies are directed toward milk pricing, but milk quality and safety have also been major public policy targets.

Dairy policies, at least at the Federal level, have evolved over time through a process of periodic reauthorization of legislative provisions. Tracking changes in dairy policy is made doubly difficult in that administrative changes in programs may be made without legislative action. The setting of butter, cheese, and nonfat dry milk purchase prices by the ASCS, and AMS's use of hearings to bring about changes in the Federal milk marketing orders, are examples.

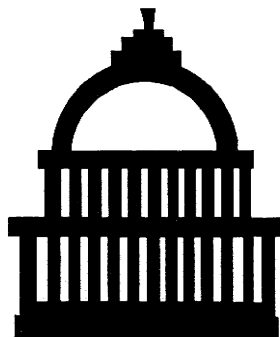
- 1840** The U.S. Census first included questions (totaling 37) related to agriculture. (Ebling)
- 1856** Massachusetts passed the first law in the United States prohibiting the adulteration of milk. (Manchester, 1983; Bartlett)
- 1862** Abraham Lincoln signed legislation creating the United States Department of Agriculture (USDA). (Baker and others).
- 1862** The Homestead Act, designed to spur expansion into the West, was signed. It was the first of several public regulations that formalized agricultural and resource policies in the West. Included are: the Desert Land

Act (1877) which gave fee simple title to 640-acre tracts of arid lands in the West, on condition that the land be reclaimed "by conducting water on it;" the Carey Act of 1894, whereby States received landgrants of 1 million acres on condition that they provide for its reclamation (States usually sold water rights to recover reclamation costs and sold land at nominal cost, but only to those who contracted to buy water rights); the 1902 Land Reclamation Act which authorized funds from sale of public lands to be used to construct storage and power dams and canal systems for irrigable lands in the West (settlers got the land free but had to pay for structures built on it over 10 years); and the Pope-Jones Water Facilities Act of 1937, which authorized the Secretary of Agriculture to provide water facilities in arid and semiarid areas. (Hallberg)

- 1881** Pure food laws were enacted in Illinois, Michigan, New York, and New Jersey. (Weber)
- 1884** The New York Dairy Commission was established to regulate and establish standards for milk in New York State. (Colman)
- 1886** The Oleomargarine Act, a Federal statute that was to be amended several times in the future, was passed. This legislation began 65 years of regulations against margarine in some form. The law that was passed included definitions of both butter and margarine. Other regulations of the same type followed, partly to support the dairy industry and partly to prevent consumer fraud concerning product content. Examples are the Filled Cheese Act of 1896, which taxed cheeses made with any fats other than butterfat and the Filled Milk Act of 1923, prohibiting substitution of any fat or oil for milkfat in milk and cream (certain exceptions were made for infant foods). (Manchester, 1983; McLaughlin; Mickle; Riepma)



- 1887** The Hatch Experiment Station Act was approved. The Act provided States with Federal grants to be used for agricultural experimentation. (True)
- 1888** Office of Experiment Stations was established. (Baker and others)
- 1889** The USDA was raised to Cabinet status. (Hathaway)
- 1890** The Sherman Antitrust Act was approved. The Act prohibited price fixing and caused problems for dairy cooperatives, which were bargaining for milk prices on behalf of farmers. (Hallberg)
- 1892** Certified milk originated by Dr. Henry L. Coit in Essex County, New Jersey. Certification meant that raw milk produced on the farm met some established set of sanitary standards. (Bartlett; Beal and Bakken)
- 1895** A Dairy Division was created in the Bureau of Animal Industry, USDA. (Baker and others)
- 1897** The Tea Importation Act was passed. This was the first U.S. law to establish a procedure for actually determining the quality of food products. (Grange)
- 1902** A Federal tax on "colored" margarine higher than on uncolored margarine was instituted. (Mickle)
- 1906** The Pure Food and Drug Act was approved. The Act established Federal standards for purity of food and drugs reaching consumers. (Hallberg)



- 1908** An ordinance was passed requiring that all milk sold as raw milk in the Chicago market had to come from tuberculin-tested cows. (Williams and others; Winn)
- 1914** The Clayton Act was approved. The Act permitted nonstock cooperatives to bargain collectively for prices on behalf of their members. (Hallberg)
- 1914** The Smith-Lever Act was passed, which formalized cooperative agricultural extension work. (Hallberg)
- 1917** The Lever Act was passed. Price-fixing of some commodities was authorized by the legislation. Licensing of producers and distributors and prohibiting unfair trade practices were also enacted under the law. Part of the package of wartime legislation associated with World War I. (Surface)
- 1919** In cooperation with dairy industry representatives, the first standards for grades of creamery butter and cheddar cheese were developed and promulgated by USDA. Grades for other products have been established since, for example, for swiss cheese, nonfat dry milk solids, and dry whole milk. (Baker)

- 1920-30's** The U.S. Public Health Service recommended a model standard milk ordinance for voluntary State and local adoption and later published a code to foster uniform interpretation. (Jones, W.)
- 1922** The Capper-Volstead Act was approved. The Act dealt with unforeseen problems for agricultural cooperatives which had arisen with passage of the Sherman Antitrust Act in 1890. Specifically, agricultural cooperatives were granted a limited exemption from rules which prevented them from bargaining for prices on behalf of their members. (Manchester, 1982)
- 1927** Federal Import Milk Act passed limiting the importation of fluid milk and cream. (USDHEW)
- 1927** The Food, Drug, and Insecticide Administration was established in USDA. It was redesignated the Food and Drug Administration in 1930. (USDA, Misc. Pub. 48)
- 1928** The Boulder Canyon Project Act was passed, which resulted in the first major multipurpose river system project in the West (Hoover Dam). Followed by Columbia River Basin Project in Washington State, units of the California Water Plan, and others. (Thorne)
- 1929** The Great Depression began. (Bean)
- 1929** The State of Utah placed an excise tax on margarine to discourage its consumption. By 1939, half the States were taxing the sale of margarine. (Burtis and Waugh)

1929	The Agricultural Marketing Act became law. This legislation under Hoover presaged the massive Government programs of the Roosevelt years. (Hamilton)	1934	Marketing agreements were terminated but licenses continued in effect. (Manchester, 1983)		animal drugs, milk testing, and other food safety concerns. (Crawford)
1930-40	Substantial changes to and greater adoption of the U.S. Public Health Service milk ordinance and code were occurring. (Williams and others)	1935	The Agricultural Adjustment Act of 1933 was rewritten. Section 32 and an amendment to provide for marketing agreements and orders for milk, rather than licenses, were included. Classified pricing and market-wide pooling were specifically allowed. Section 22 related to imports of commodities that might undercut price support activities of the U.S. Government. Government purchases for food aid and industry support were also included in the 1935 legislation. (Hallberg)	1939	Major expansion of the School Lunch Program was undertaken. (Baker and others)
	The legality of the rules in many States governing milk markets was challenged in several court cases and, in general, upheld. California adopted a State plan that is still in effect, which is not linked to some key Federal regulations, particularly the Federal milk marketing orders. Rules in several States are still in effect but have become somewhat less important. (USDA, April 1986)			1939	A Food Stamp program was considered and a pilot program was put in place. Food stamp programs were tried until 1943 but were not to become part of permanent agricultural legislation until the 1960's. (Baker and others)
1931	Federal tax on colored margarine was applied to all slightly yellow margarine. (Mickle)	1935	Federal assistance for School Lunch Programs began. (Southworth and Klaymen)	1939	The first Agricultural Marketing Service was established in the USDA. (Baker and others)
1933	The Agricultural Adjustment Act, under which the Agricultural Adjustment Administration was established, was approved. The Act authorized marketing agreements and licenses for milk. The first marketing agreement issued under the Act was for fluid milk in Chicago. (Manchester, 1983; Nourse)	1936	The Supreme Court invalidated the Agricultural Adjustment Act. (Murphy)	1940	A school penny-milk program under Section 32 of amendments to the Agricultural Adjustment Act was approved. (Moffett and others.)
			The Rural Electrification Act (REA) was approved. (Ellis)	1941	The price of milk paid to farmers was supported by purchases of manufactured dairy products. The Steagall Amendment set parity at 85 percent for nonbasic commodities for which increased production was needed to satisfy the war effort. Dairy was one of these products. The support price was raised to 90 percent of parity in 1942. (Hallberg; Manchester, 1983)
1933	Parity, an idea based on "fair exchange" that had been developed during the 1920's, was used as a general goal for assistance to farmers. Later, parity was used explicitly in setting support prices and loan rates. (Teigen)	1937	The Agricultural Marketing Agreement Act was passed, reenacting 1935 legislation; basis for Federal milk marketing orders. (Rubel and Holt)	1942	Every-other-day milk delivery required as a war conservation measure. (Wisconsin)
1933	The Commodity Credit Corporation was established. (Hamilton)	1938	The Agricultural Adjustment Act of 1938, which was based on the "ever normal granary" concept, was approved. One of the four legislative acts commonly considered as part of the "permanent" legislation for agricultural price and income policy. (Hallberg)	1946	The National School Lunch Act was approved. It established grants-in-aid to promote nonprofit school lunch programs. (Sandstrom)
		1938	The Food, Drug, and Cosmetic Act was approved. This legislation authorizes the FDA to act on food labeling, new		

- 1946** The Agricultural Research and Marketing Act was approved. Federal Standards for grading and inspection were determined. Authority for the Agricultural Marketing Service to engage in transportation matters before regulatory agencies was broadened. (Banfield)
- 1946** All foods except sugar, syrup, and rice were removed from price controls. (Baker and Rasmussen)
- 1946** Presidential proclamation of cessation of World War II hostilities resulted in price supports ending 2 years later unless they were reauthorized under new legislation. (Smith and Roth)
- 1947** The General Agreement on Tariffs and Trade was negotiated and signed, becoming effective in 1948. (Johnson)
- 1948** Obligations under the Steagall Amendment were terminated, which would result in lowering the parity level of support for dairy. However, the Agricultural Act of 1948 approved extending dairy price supports at 90 percent of parity through 1949. (Manchester, 1983)
- 1948** The Commodity Credit Corporation Charter Act was passed. One of the four legislative acts commonly considered as part of the permanent legislation for agricultural price and income policy. (Hallberg)
- 1949** The Agricultural Act of 1949 became the foundation of many current farm programs. It incorporated the flexible price support and the "modern" parity formula that had been developed in 1948. Flexibility refers to the discretion of the Secretary of Agriculture to set the minimum support price level for milk within a band (75 percent to 90 percent of parity). From 1949 to 1981, the minimum support price was raised above the minimum 75 percent of parity level four times by Congress, in 1960, 1973, 1977, and 1979, and in other times it was raised by USDA. The current milk price support program began. Section 416 provided for the domestic disposition through donations of surplus products to U.S. voluntary relief organizations. One of the four legislative acts commonly considered as part of the permanent legislation for agricultural price and income policy. (USDA, 1967; Hallberg; Manchester, 1983)
- 1950** The Federal tax on colored margarine was repealed with enactment of the Federal Margarine Act. (Manchester, 1983; Riepma)
- 1953** Section 22 Authority to restrict dairy product imports was first applied, by Presidential proclamation. (USDA, FAS, 1988)
- 1954** The Agricultural Trade Development and Assistance Act of 1954 (Public Law 480) revised Section 416 to encourage export of price-supported products to nations unable to buy on the world market. One of the four legislative acts commonly considered as part of the permanent legislation for agricultural price and income policy. (Toma)
- 1954** The Special School Milk Program was established under the Agricultural Act of 1954 to use Commodity Credit Corporation (CCC) funds to increase fluid milk use in schools. (Benson)
- 1956** The Special Milk Program was extended to include nonprofit summer camps, orphanages, and other child-care institutions. (Smith and Roth)
- 1956** The CCC Export Credit Sales program was established. (Dean)
- 1957** The Treaty of Rome was signed. This treaty laid the groundwork for today's European Economic Community (EEC or EC) and its Common Agricultural Policy (CAP). The dairy program provisions of the CAP were not finalized until 1968. Since November 1, 1993, the group has been called the European Union (EU). (Blayney and Fallert)
- 1959** The Food for Peace program was inaugurated and legislation authorizing a Food Stamp program was passed. (Barlow)
- 1960's** Changes made in the Federal milk marketing orders that transformed the regulations from a series of loosely linked separate orders to an integrated system. (Manchester, 1983)
- Legal actions to draw attention to compensatory pricing and down allocation differences among orders. Seen as barriers to milk movements.
- Movement toward a common base for minimum class prices—the Minnesota-Wisconsin (M-W) price.
- Setting Class I differentials on an Eau Claire-plus transportation base imposed

geographical price alignments in orders east of the Rocky Mountains.

Orders adopting the M-W price as the basis for pricing became linked to national supply-demand movements and the price support program, which supported manufacturing grade milk prices.

Adaptation of order rules to the conversion of Grade B to Grade A milk production.

Establishment of new orders, many in the Upper Midwest, later merged in large regional orders.

Changes in pool plant requirements.

Elimination of local supply-demand adjusters.

1960-61 Minnesota-Wisconsin (M-W) price series for manufacturing grade milk developed. It is a market pay price for manufacturing grade (Grade B) milk resulting from competition among the Grade B plants. A widely accepted indicator of milk value in manufacturing uses, the M-W became the basis for classified pricing in the Chicago order. (USDA, AMS)

1961 The Agricultural Act of 1961 authorized the Special Milk Program and extended Public Law 480. (Hadwiger and Talbot)

1962-65 The Federal Trade Commission (FTC) reached final decisions on complaints filed against large fluid processors in the mid-1950's related to their merger and acquisition activities. The processors were either found in violation or entered into consent decrees. (Manchester, 1983; FTC)

1963 The beginning of the Kennedy Round of GATT multilateral trade negotiations that initiated long-term phasing out of cheese tariffs. The Round was completed in 1967. (Pearce)

1964 A national Food Stamp program was approved. The Food Stamp Act made the program a part of the permanent agricultural legislation. (Hallberg)

1970 The Agricultural Act of 1970 suspended the obligation to support prices of farm-separated cream. Thus, CCC could lower the purchase price for butter and raise the price for nonfat dry milk. (Miller and Short; Fallert and others)

1970 The National School Lunch Program was extended to more needy children. (Smith and Roth)

1973 The Tokyo Round of the GATT trade negotiations began. More countries participate and non-tariff barriers to trade, particularly agricultural trade, were emphasized in the discussions. Essentially established the U.S. quota for dairy products at the level it has held since. The Round was completed in 1979. (Pearce)

1973 The Agriculture and Consumer Protection Act approved. The Act set a minimum level of support at 80 percent of parity. (Fallert and others)

1974-77 Support prices adjusted frequently because of rapid inflation. No support price lasted more than 9 months. (Fallert and others)

1974 Uniform milk classification plan established in seven markets. Definitions of products included in each classification. (39 FR 8202)

1975 The M-W price became the basic formula price (minimum Class I and II price mover) in all Federal milk marketing orders. (USDA, AMS)

1977 The Food and Agriculture Act of 1977 was passed. The Act set a minimum of 80 percent of parity for milk. It also required that the support price be adjusted semiannually to reflect changes in prices paid by farmers. These provisions were to be in effect for 2 years. (Fallert and others)

1979 The support price provisions of the 1977 Food and Agriculture Act were extended for 2 years. (Fallert and others)

1981 The Agriculture and Food Act of 1981 marked an important change in the dairy price support program. Minimum support prices were legislatively set for the years 1982-85 in dollars per hundredweight, not as a percentage of parity. Only under special circumstances did the parity standard of milk support pricing come into play. The adjustment need no longer be made on a semiannual basis, as in previous legislation. (Johnson and others)

1981-82 The support price was frozen at \$13.10 per hundredweight. (Fallert and others)

1981-83 The Omnibus Budget Reconciliation Act of 1982 authorized a 50-cent deduction per hundredweight on all milk marketed. It was first collected in April 1983. An additional 50-cent deduction, implemented on September 1, 1983, was

refundable to producers who reduced marketings by a specified amount. (Fallert and others)

1983 The Dairy and Tobacco Adjustment Act of 1983 provided a diversion program for dairy producers and froze price supports. The diversion operated between January 1984 and March 1985. The Act also lowered support to \$12.60 per hundredweight on December 1, 1983. The \$0.50 deduction per hundredweight was continued through March 1985. The National Dairy Promotion and Research Board was authorized. Promotion and research activities were to be paid for by a nonrefundable assessment of 15 cents per hundredweight on milk marketings. (Fallert and others)

1984 The FDA ruled that milk and meat from cows given supplemental doses of rbST were safe for human consumption. The decision was based on data provided by sponsoring companies and other investigators. Safety of the milk and meat is only one of the safety criteria the products must meet prior to approval for commercial sale. (Sechan)

1985 Because purchases were expected to exceed trigger levels set under the Dairy and Tobacco Adjustment Act of 1983, the support price was reduced twice, once each on April 1 and July 1. (Fallert and others)

1985 The Food Security Act of 1985 set the Class I differentials in Federal milk marketing orders, increasing most differentials. The effective date was May 1, 1986. This was the first time the Congress had legislated pricing in the Federal orders. (Fallert and others)



1985 A Dairy Export Incentive Program (DEIP) was authorized by the Food Security Act. This program was designed to assist U.S. exporters of dairy products to enter foreign markets. The program has been extended and revised by 1990 agricultural legislation. (Glaser)

1986 The Food Security Act of 1985 established a whole herd buyout program for dairy farmers. Cows and heifers of farmers exiting dairying under the program were exported or slaughtered. The Act also set the support price at \$11.60 per hundredweight for calendar 1986, \$11.34 for January-September 1987, and \$11.00 thereafter. On January 1 of 1988, 1989, and 1990, the support price had to be decreased by \$0.50 if projected removals exceeded 5 billion pounds milk equivalent (ME) or increased \$0.50 if removals were projected to be less than 2.5 billion pounds ME. (Fallert and others)

1986 The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) began. Eliminating agricultural trade barriers was made a keystone of the talks, eventually gaining the status as a measure of success or failure of the Round. (Blayney and Fallert)

1988 The Agricultural Biotechnology Research Advisory Committee first met, recognizing the potential importance of biotechnological issues for agriculture in the future. (USDA, Minutes of ABRAC)

1989 Drought relief legislation in 1988 prohibited a support price reduction on January 1, 1989. The legislation also required a \$0.50 increase in the support price on April 1, 1989, followed by a \$0.50 reduction in price on July 1, 1989. (Fallert and others)

1989 The USDA announced stricter guidelines in defining the 1985 Animal Welfare Act. The new guidelines affected the production of veal, an activity that has been criticized by many animal rights or animal welfare groups. (USDA News, Aug. 30, 1989)

- 1990's** Several States, seeing no Federal pricing changes, have implemented regulations that ultimately translate into higher milk prices to the producers within their State. Some court cases have been filed to consider their legality. (Saubert, 1992)
- 1990** The support price was lowered to \$10.10 per hundredweight effective January 1. (USDA, ASCS, 1990)
- 1990** A national hearing on Federal milk market orders was held Sept.-Nov. 1990. The hearing was held in response to an announcement by Secretary of Agriculture Clayton Yeutter. (*USDA News*, March 29, 1990)
- 1990** The Food, Agriculture, Conservation and Trade Act (FACTA) established a schedule of support price changes related to surpluses but contained a floor for the dairy support price at \$10.10 per hundredweight. The Act also contained provisions for a study of milk inventory management programs, the replacement of the M-W price series (which had been previously announced in 1990), "make allowances," using total solids for milk accounting purposes, and implementing results of the national milk order hearing. (Pollack and Lynch)
- 1992** The North American Free Trade Agreement (NAFTA) was signed by the U.S., Canadian, and Mexican heads of state. (USDA, OE)
- 1993** Butter and nonfat dry milk purchase prices were adjusted in July in a way that represented a shift of \$0.50 in the value of 100 pounds of milk from milkfat to skim milk. (*Dairy S&O*, 1993)
- 1993** The final decision of the USDA on the national hearing on Federal milk marketing orders was published. It called for uniform establishment of three classes of milk in all orders and modified pricing of reconstituted milk. The changes were viewed by many as very minor. The changes became effective on July 1. (58 FR 12634)
- 1993** The Omnibus Budget Reconciliation Act of 1993 contained several features directly related to the dairy price support program. Most of the provisions of the 1990 legislation were extended to 1996. Butter and nonfat dry milk prices were defined, budget reconciliation assessment rates were specified, and issues related to a ban on the sale of recombinant bST were presented. (*Dairy S&O*, 1993)
- 1993** In a vote disputed by many farmers, the National Dairy Promotion and Research Board remained in existence, with funding from a 15 cent per hundredweight assessment on all milk marketings. The modified bloc-voting procedures used by USDA came under fire. The concerns raised about voting procedures in this case may affect how voting is handled in other matters requiring producer referendums. (*Dairy Profit Weekly*, Oct. 25, 1993)
- 1993** The FDA approved a recombinantly produced bST product for commercial sale. Only the product produced by Monsanto, one of the companies developing such products, was approved. However, a 90-day moratorium went into effect on sales the day of the approval, November 5, 1993. (HHS; Schwartz)

Endnote

It should be obvious that milk production and the dairy industry in the United States have undergone rather dramatic changes during the course of time. The various events we have identified are by no means all that have had some effects. It is also likely that some of the events we have chosen would not be considered landmarks in the minds of many. It is, however, a list that offers those persons interested in the U.S. dairy industry some insights into the many forces that have played roles in its development and its current structure, performance, and conduct.

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