AgWest FARM CREDIT

Industry Perspectives

Dairy

This Industry Perspective was prepared by AgWest Farm Credit's Dairy Industry Team. Direct questions and comments to the Business Management Center by email at AgWestBMC@agwestfc.com.

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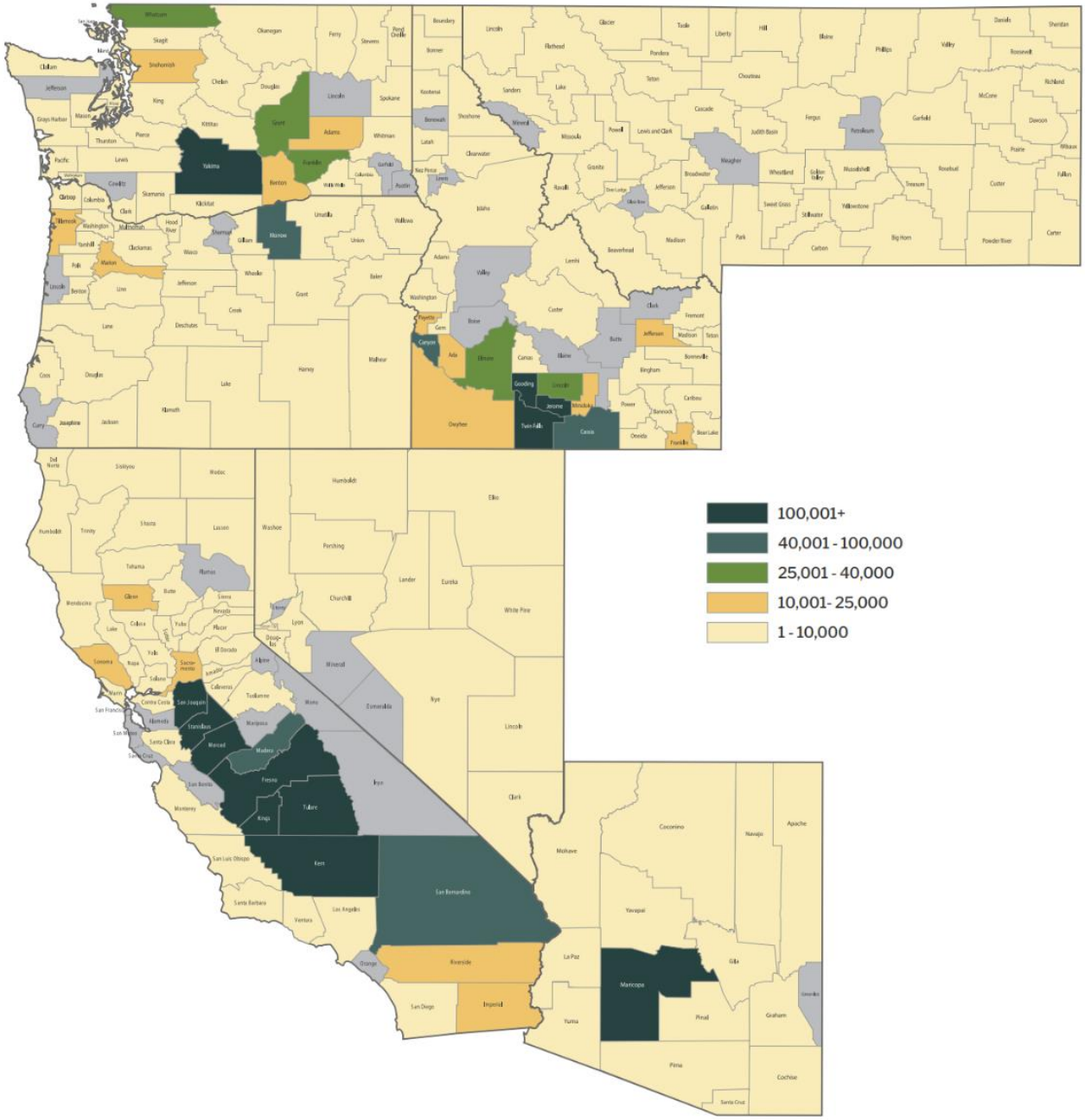
Industry overview

Dairy is a cornerstone agricultural industry in the Western U.S., supported by favorable climate, land availability and feed resources that drive milk production. Raw milk flows through a value chain of cooperatives and independent processors that bottle it into fluid milk or make an array of dairy products such as cheese, yogurt, butter and powdered milk. These products are then sold locally, nationally and globally.

Production trends

The United States is the world's third-largest milk producer, behind India and the European Union, supported by reliable feed supplies and extensive processing infrastructure. Within the U.S., milk production is concentrated in the West and Upper Midwest, where climate support year-round production and export-oriented processing. California is the nation's leading milk-producing state, followed by Wisconsin and Idaho. In AgWest territory, Washington ranks 11th nationally, Arizona 16th and Oregon 19th, collectively representing a meaningful share of U.S. milk supply. These states benefit from proximity to feed sources, established cooperative systems and access to domestic and global markets.

Milk cows by county within AgWest territory



Source: USDA Census of Agriculture, 2022.

State	Milk Cows	Total Production *(Billion Lbs.)*	Milk Per Cow *(Lbs. per Head)*
Arizona	195,000	4.8	24,431
California	1,712,000	40.9	23,919
Idaho	714,000	18.3	25,571
Oregon	119,000	2.5	21,034
Washington	242,000	5.8	24,095
Montana	<10,000	No Data Available	No Data Available
Western Total	2,992,000	72.3	23,810*

*Source: USDA NASS. *Weighted average by number of cows.*

Arizona

Cattle are one of the "5 Cs" Arizona is known for (the other Cs include Copper, Cotton, Citrus and Climate). Arizona's dairy industry generates over $1.06 billion in production value and accounts for roughly 2.1% of U.S. milk production. Dairy cows were responsible for over $1.06 billion in production value and 2.1% of national milk production. Dairy products are one of Arizona's top agricultural commodities, comprising more than a fourth of the state's total agricultural product sales. Production is largely cooperative-based, led by United Dairymen of Arizona, with an emphasis on Class I and Class IV milk products.

California

California anchors national production with approximately 1.71 million dairy cows and $8.6 billion in dairy cash receipts. Tulare County stands out as the largest dairy-producing county in the nation, housing roughly one-third of California's dairy cows and consistently ranking among the top agricultural counties nationwide by sales. Production is heavily concentrated in Central California, where favorable climate, feed access, and infrastructure support large operations. The state also leads in the adoption of dairy digesters that convert methane from manure into renewable energy. California is structured with a strongly prevalent co-op structure, and an estimated 75 - 80% of the milk is sent to these processors.

Idaho

Dairy is Idaho's largest agricultural sector, generating more than $3.8 billion in cash receipts. The state is home to approximately 350 licensed dairy operations and more than 714,000 milk cows. Over 70% of these cows are concentrated in the Magic Valley, which includes Jerome, Gooding, Twin Falls, Cassia, and Minidoka counties. The Treasure Valley, located in the Boise area, accounts for about 14% of Idaho's milk-cow herd. Idaho ranks as the sixth most efficient state in milk production per cow and is the highest-ranking state in the Western United States. Most of the state's milk is used for cheese production. Behind only California and Wisconsin, Idaho is the third-largest producer of natural and processed cheese in the country, manufacturing more than 1.0 billion pounds annually.

Washington

Dairy products represent Washington's second-largest agricultural sector, surpassed only by apples. Dairy production generates more than $1.4 billion in cash receipts, and the state ranks 11th nationally in total milk production. Washington has approximately 280 licensed dairies, with Yakima County hosting the largest share. Yakima accounts for 38% of the state's milk cows, followed by Whatcom County, which holds about 17% of Washington's milking herd.

Oregon

Oregon's dairy industry produces approximately 2.5 billion pounds of milk annually, with a total value exceeding $595 million. Morrow County in northern Oregon is the state's largest dairy county, containing about 35% of all milk cows. Other major dairy-producing counties, ranked by herd size, include Tillamook, Marion, Yamhill, Klamath, and Polk.

Montana

Dairy is a relatively small industry in Montana, with fewer than 10,000 dairy cows statewide. The state's livestock sector is primarily focused on beef cattle production. According to the 2022 Census of Agriculture, Montana has 273 farms with milk cows; however, only 72 of these farms have 100 cows or more, reflecting the limited presence of large-scale dairy operations.

Value and supply chain

The dairy value chain includes herd and feed inputs, milk production, transport, processing, packaging, marketing and pricing. In the Western United States, these stages are carried out by a mix of independent operators and vertically integrated businesses, including cooperatives and privately owned processors.

Production

Livestock and feed are the main inputs for dairy production: heifer calves, springers (heifers close to calving) and cows. Bull calves are generally sold as "day-old" calves and raised as beef animals. Most dairies use artificial insemination (AI) techniques and bulls are kept only to breed cows when AI is unsuccessful.

Dairies have two options for sourcing cows. They can raise heifer calves to maturity, or they can purchase mature cows. Once a cow or springer freshens (calves and begins producing milk), she can produce milk for approximately 305 days, with peak milk occurring during the first 100 days after calving. Average production is between 65-85 pounds per head per day and varies based on region, feed, breed and seasonal weather conditions.

Tulare County in California, the Magic Valley of Idaho, and the Yakima Valley of Washington are the largest dairy hubs in the United States. Climate plays a significant role in productivity and cost structure. In colder regions, winter conditions can reduce milk output as cows expend more energy maintaining body heat, while in warmer regions, summer heat stress increases cooling costs and suppresses production. Feed rations vary by location depending on crop availability and water supply. Higher-quality feed rations can increase milk production, as can cow breed. Holsteins, for example, produce significantly higher milk volumes than Jerseys.

Feed is a key component in milk production. Rations for lactating dairy cows are formulated based on crude protein and net energy for lactation. To achieve maximum production, rations are also balanced for effective fiber, non-structural carbohydrates, ruminal un-degraded protein, soluble protein and other nutritional characteristics of the feed. Alfalfa hay and protein meals (soybean, canola, and cottonseed meals) are the major sources of protein. Grain and silage are sources of energy and protein. Adequate levels of minerals, such as salt, are also important. These ingredients are fed to cows as a total mixed ration (TMR). Some dairymen have the technology to track each cow's feed consumption. The collected data offers insight into feed conversion and milk components. Pasture-based dairies are still common but tend to be smaller and provide mixed rations during the winter.

Dairies have several sources of income; milk sales account for the largest portion of revenue. The sale of cull cows, heifers and bull calves also contributes to dairy income.

Beef integration

Dairy operations are increasingly integrating beef production as a supplemental revenue stream. Rather than selling off young dairy calves as day olds, many producers are choosing to raise and finish the calves. Crossbreeding traditional dairy breeds, such as Holsteins, with beef breeds, such as Black Angus, or artificially inseminating beef calves into dairy cows is a popular new strategy. This has improved parturition due to natural lower birth weights and increased calf carcass value.

Beef ranchers are already seeing the effects of more cattle entering the feedlots. This added supply contributes to greater price variability in the beef market. Dairymen have many comparative advantages in raising beef calves and are in the market to stay.

Transport

Milk is collected from dairies in large, insulated tanker trucks. Large dairies ship several trucks per day, whereas smaller dairies may ship milk every two days. In some regions, independent trucking companies ship milk from farms to processors. Producers pay for shipping and processors coordinate where milk is sent.

Processing, packaging, and marketing

Processors range from small independent creameries serving niche markets to cooperatives and privately owned processors.

Small creameries may be vertically integrated producers or have a contracted agreement with a dairy. These processors bottle milk or make relatively small batches of artisanal dairy products, such as cheese. These small operations generally market their products to local consumers.

Co-ops process and market a significant amount of milk in the AgWest region. These processors source milk from member/owner dairy farmers and use the milk in a wide array of products. Co-ops generally operate across two primary marketing streams. The first is branded consumer products, such as fluid milk, cheese, butter, cottage cheese, cream cheese and ice cream which are marketed widely to consumers through retail outlets. Products may be packaged under

the co-op's brand or co-branded with another company. The second marketing stream is dairy ingredients, primarily milk powder and cheese. Co-ops sell these commodities to food manufacturers who in turn make value-added products. Co-op business models can also offer better milk prices to members and consumers.

Private processors purchase milk from co-ops and directly from producers. Processing facilities are generally specialized (a cheese, yogurt or powder plant) as part of a geographically diverse product mix.

Milk pricing and marketing infrastructure

Dairy producers receive varying milk prices depending on the milk components (fat and protein). Contractual agreements establish specifics for what the bottler or processor requires in their supply. The milk price includes adjustments for component content and quality. Milk quality reflects overall herd health and management, and is commonly measured by somatic cell count, an indicator of milk cleanliness and udder health.

Industry baseline standards for milk components are 3.5% butterfat and 3% protein. Producers generally receive premiums when butterfat levels meet or exceed these thresholds. Feed formulation and breed selection influence component levels; Jerseys, for example, produce milk with higher butterfat content than Holsteins. Additional premiums may be paid for milk with somatic cell counts of 200,000 per milliliter or less.

Most Western states participate in the Federal Milk Market Order (FMMO) system, which establishes minimum milk prices across 11 regional orders. California, Arizona, Washington, most of Oregon, and North Idaho participate in FMMOs, while Montana and Southern Idaho do not.

Milk marketed under the FMMO is classified into four categories:

- Class I: fluid milk for consumption (pints, gallons, chocolate milk, etc.)
- Class II: soft products (ice cream, yogurt, cottage cheese, etc.)
- Class III: cheese (American and all others)
- Class IV: butter and powdered milk

A blend price is paid to producers within each market order based on pooled revenues from all milk classes. The pool price reflects a weighted average of Class I, II, III, and IV utilization within the market boundary. In Washington and Oregon, milk prices are based on a blend of all classes.

Class utilization percentages fluctuate monthly based on market demand and relative prices. For example, when Class III prices exceed Class IV prices, producers may market more cheese milk outside the pool to capture higher returns, increasing the proportion of Class IV milk in the pool. The reverse occurs when Class IV prices are stronger. In general terms, FMMO states often receive higher milk prices than non-FMMO participants due to the pricing influence of fluid milk, although this relationship reverses during periods of strong cheese markets. In Southern Idaho, milk pricing is typically based on cheese yield or a blend of Class III and Class IV prices, reflecting the region's focus on cheese manufacturing.

Drivers

Global markets

Eight major dairy commodities are traded in international markets:

- Whole milk powder (WMP)
- Whey powder
- Cheese
- Skim milk powder (nonfat dry milk, or SMP)
- Butter
- Lactose
- Casein
- Condensed milk

In 2025, the United States imported approximately $1.9 billion in cheese products while exporting over $2.5 billion in cheese, maintaining its position as both a significant importer and exporter. This two-way trade is common in global dairy markets and allows countries to balance domestic supply and demand, access specialized product varieties, and capitalize on regional price and quality advantages.

The European Union remains the world's largest dairy exporter, led by cheese shipments, followed by New Zealand, which continues to dominate global trade in milk powders and butter, and the United States, which has expanded its export

footprint through strong growth in cheese, butterfat and high-protein whey products. In 2025, U.S. dairy exports reached approximately $9.5 billion, marking one of the highest export values on record and underscoring the growing importance of international markets to U.S. dairy producers.

Regulation

Capital requirements to conform to new rules and regulations are a major dairy industry driver. In Washington, proposed rules concerning nutrient (manure) management may necessitate additional lagoon capacity and a larger land base to spread manure. California producers are subject to the Climate Risk Carbon Initiative and Low Carbon Fuel Standard. Methane digesters are becoming more common. Over 100 dairies have added a digester to their operation. Currently, many of the changes are voluntary, but as time continues, more stringent restrictions may be implemented to reach the emissions goal.

Breeding livestock genetics and replacement

Improved breeding protocols and the use of sexed semen (semen for a specified gender of calf) have created an abundance of high-quality heifers in replacement programs. While a cull rate of 35% or more might have been alarming in the past, it is more typical today as the consistent supply of heifers is allowing operations to maximize efficiencies and still maintain herd size.

Beef integration

Dairy cattle are making a big impact in the beef industry and dairymen are exploring how they can further supplement income through new beef involved business plans. Crossbred dairy beef animals can be sold as both day old's as well as many producers are choosing to raise and finish the calves. This strategy grew in popularity in the early 2020s as day old crossbred calves fetched more than $1,500 per head.

Beef ranchers are already seeing the effects of more cattle entering the feedlots. Beef prices have dropped with new market competition, increasing supply. Dairies have many comparative advantages in raising beef calves and are in the market to stay.

Labor and robotics

Dairy production is labor intensive and heavily dependent on low-cost labor to support growth. Historically, the U.S. dairy industry has relied on migrant laborers from Mexico and Latin American countries. Challenges with immigration policy in recent years have led to labor shortages and rising labor costs. Ultimately growth is constrained in key dairy-producing areas across the United States.

Robotic milking is a growing solution to the problems of rising labor costs and labor shortages. Robotic milking systems, also called Automatic Milking Systems (AMS), became widely available to dairy producers in the early 1990s and were popular in Europe before gaining popularity in the United States. Due to increasing labor costs and constraints on labor supply, commercial operations are exploring ways to adopt robotic milking systems. While milking each cow, AMS machines also collect data for quantity and quality. Low production can signify early if an animal's health is struggling, even before symptoms are visible. Producers have also noted their cows prefer and are soothed by AM systems and tend to produce higher quantities.

There are three types of robotic milking systems.

- Single stall unit: uses one robotic arm for each stall, the most common system.
- Multiple stall unit: uses one robotic arm for two or more milking stalls.
- Automatic Milking Rotary (AMR): uses a rotating platform that may vary in size and employs multiple robotic arms, depending on the size of the platform. Each robotic arm on an AMR may have a specialized function compared to the stall units, where a single robotic arm handles multiple functions. These robots reduce the need for workers to handle animals directly; however, they are increasing the need for skilled technicians and data analysists.

Appendix A: **Best practices**

Dairy producers implement various strategies to remain competitive and position their businesses for long-term success. This section details best practices commonly used by AgWest dairy producers to support operational resilience and long-term viability.

Strong operational management

Successful operators fully understand their production capacity and costs, and have a specific management plan to balance production levels, costs and market returns. Dairy producers implementing the following proven best practices are well positioned for ongoing prosperity and future growth.

Financial management

- Establish a liquidity reserve in the form of cash or equities in cows and feed. These liquidity reserves will enable an operation to survive through sustained periods of volatility.
- Maintain the integrity of the top half of the balance sheet. Do not use cash reserves for long-term purchases or capital improvements and closely monitor working capital.
- Reduce leverage, which is a key to long-term survivability. On a market-based balance sheet, leverage under 50% should be maintained, while less than 40% is preferred.
- Consider the impact of every potential expansion on management, leverage and cash reserves.
- Prepare budgets and be accountable to those budgets. The operation's management team convenes regularly to review performance. Producers are aware of operational performance on a month-to-month basis.
- Have a clear understanding of break-even costs and use accurate, timely data to guide decision-making. Comprehensive cost awareness is fundamental to effective management.
- Evaluate cash flow and look for ways to continually lower capital needs.
- Understand and assess counterparty risk. Know your customers and input suppliers.
- Develop a comprehensive permanent commodity price risk management plan. With continued volatility in both milk price and input costs, producers need to take advantage of all available tools to lock in profitable margins and protect their operation from undue risk.
- Frequent calls with a CPA, commodity risk hedging firm and lender provide valuable current market data.
- Consider engaging in a risk management program. There are tools to utilize futures, options and insurance plans. Dairy Revenue Protection (DRP) is a federally subsidized insurance program that allows producers to protect their gross revenue from milk sales. DRP enables producers to establish a revenue guarantee tied to futures-based milk prices without limiting upside potential. A key advantage of DRP is the absence of margin calls, which can be associated with futures and options strategies, particularly in higher interest rate environments. DRP has proven to be an effective tool for protecting downside risk while preserving market opportunity.

Herd management

- Maintain herd replacement programs with a heifer-to-cow ratio ranging from 80% to 100% if a cost-benefit analysis supports the raise-on-farm versus purchase decision.
- Understand the costs and benefits of a full heifer program relative to purchasing replacements.

Analyze every aspect of the business to identify areas that can be cut to control expenses or modified to improve operating efficiency. Examples include evaluation of the heifer program, capital spending (necessity or want), labor strategies, barn efficiency, merits of milking twice vs. three times per day, etc. Fluid milk consumption is declining; however, consumers are incorporating more dairy products into their diet. Milk processors are more interested in milk components than water quantity. Adding different dairy breeds with high butterfat to the herd or breeding for stronger components will increase milk value in the market.

Environmental risk management

- Establish a land base adequate to dispose of all waste. Consider alternatives to land application, such as manure digesters.
- Connect with local regulatory agencies to implement a nutrient management plan or explore other environmental monitoring techniques.
- Understand regulations and permitting processes to avoid legal liability that could jeopardize the viability of operations.
- California producers operate within a more complex environmental regulatory framework. A growing number of dairies have installed methane digesters to reduce emissions while generating renewable natural gas and additional revenue streams.
- Develop and maintain a documented waste and nutrient management action plan that aligns with regulatory requirements and sustainability objectives.

Feed

- Manage feed costs by contracting feed with custom growers, hedging or maintaining a controlled feed base through owned or long-term leased acreage. As feed is typically the largest single expense to a dairy operation, management of this cost is critical.
- Examine feed rations relative to feed component costs to assure the feed ration is as economical as possible for the level of desired milk production and herd health.

Appendix B: Glossary

Alfalfa: A leguminous crop for forage or hay used in livestock feeding.

Baler: A piece of machinery that compresses and binds hay/alfalfa into bales to feed cows.

Biosecurity: Any of a broad range of practices enforced at a dairy farm to prevent transmittal of pathogens from other sources by feed, cattle, people or other animals.

Butter: Made by churning or shaking pasteurized cream until the butterfat separates from the remaining fluid, called buttermilk.

Blend price: A minimum weighted average price paid to producers based on the Federal Milk Orders. The blend price may be adjusted for butterfat content and plant location.

Bovine: A member of the subfamily (Bovinae) of ruminant mammals, referring to cattle.

Bull: A sexually mature, uncastrated bovine male.

Bulk tank: A large, insulated container that is used to store and cool milk quickly to 2° to 4°C (35° to 39°F).

Bunk: A feed trough or feeding station for cattle.

Bunker: A flat rectangular structure used to store forages.

Butterfat: The fat that is found in milk; also referred to as milk fat.

Calf: A young male or female bovine.

Cheese: A dairy product made by coagulating milk, separating curds from whey and processing the curds through heating, draining, pressing and/or aging.

Cooperative: A firm that is owned by its farmer-members, is operated for their benefit, and distributes earnings based on patronage (volume of milk).

Cow: A mature female bovine that has borne a calf.

Cull: To remove a cow from the herd.

Curds: The white solid that forms when milk coagulates (clumps together) in the cheese-making process.

CWT (cwt): Abbreviation for hundredweight, or 100 pounds.

Dairy cow: A bovine from which milk production is intended for human consumption.

Dairy steer: A neutered male of any of the dairy cattle breeds. "Dairy steers" are raised for meat production and usually managed like beef cattle.

Dam: Mother or female parent in a pedigree.

Days-in-milk: The number of days a cow has been milking since the last freshening (calving).

Dry cow: A cow that is not lactating during the period between lactations, typically in preparation for calving.

Electronic feeders: Stations in which cows are fed specified amounts of feed by a computer that recognizes their unique electronic identification transponders.

Federal Milk Order: A classified pricing system based on Grade A milk use. The four categories are:

- Class I: fluid milk for consumption
- Class II: soft products (ice cream, yogurt, cottage cheese, etc.)
- Class III: cheese
- Class IV: butter or powdered milk

Feed/feed ration: Nutritionally balanced mixture of hay, grain, silage, vitamins and minerals prepared for and fed to cows.

Flat barn: An area for milking cattle where the person milking is on the same level as the cow. May be used with a pipeline or bucket milking system. Generally, the same area is used for cow housing.

Fluid milk: Milk that is sold at stores in the form of milk or cream.

Forage: Crops high in fiber and grown especially to feed cattle. Includes grasses and legumes cut at the proper stage of maturity and stored to preserve quality.

Freshening: When a cow gives birth and begins to produce milk.

Fresh cow: A cow that has recently given birth to a calf.

Fresh milk: Milk that has been recently produced and processed, typically referring to fluid milk that has not been dehydrated or concentrated.

Grade A or Fluid Grade milk: Milk produced under sanitary conditions qualified for human consumption.

Grain: Small, hard, dry seeds, with or without attached hulls or fruit layers, harvested for human or animal consumption. Examples include corn, wheat, soybeans and canola.

Hay: Grass, legumes or other herbaceous plants that have been cut, dried and stored for use as animal feed.

Haylage: Hay-silage. A type of moist feed prepared by chopping green alfalfa or grass, kept in airtight silos, and fed to cattle.

Heifer: A young female bovine before she has given birth to a calf and started to produce milk.

Holstein: Breed of dairy cow that is black and white in color.

Herd: A group of cows; cattle.

Homogenization: Process of breaking up fat globules into smaller particles to allow the fat to stay evenly distributed throughout the milk.

Hundredweight: Equal to 100 pounds. The symbol for hundredweight is cwt.

Industrial milk: Milk that is sold for further processing into dairy products such as cheese, ice cream, etc.

Jersey: Breed of dairy cow that is usually brown in color.

Lactate: To secrete or produce milk.

Lactose: A sugar that is found only in milk.

Lagoon: Storage pond for manure.

Legume: A plant species that has seed pods that split along both sides when ripe. Some of the more common legumes are beans, lentils, peanuts, peas and soybeans.

Low Carbon Fuel Standard (LCFS): Rule designed to reduce carbon output caused by transportation fuels, aiming to reduce reliance on fossil fuels and limit environmental impacts through 2030.

Mastitis: An inflammation of the mammary gland (or glands), usually caused by bacteria.

Raw milk: Milk that has not yet been pasteurized.

Manure: Organic matter derived from cattle feces used as an organic fertilizer.

Milk powder: A dairy product obtained by removing most of the water from milk through evaporation and spray-drying.

Milk protein concentrate (MPC): Concentrated milk product that contains 40-90% protein.

National Agricultural Statistics Service (NASS): USDA agency that conducts surveys and gathers data regarding U.S. and international agriculture.

Parlor: The specialized area on the dairy farm where milking is performed. Parlors come in many types: flat barn, walk-through, herringbone, parallel, swing and rotary.

Pasture: Plants, such as grass, grown for feeding or grazing animals.

Pasteurization: The process of heating raw milk to a high temperature and cooling it rapidly to kill any natural bacteria that may be present.

Pool price or pooling: The price paid by processors for milk based on category of use. Processors pay into or draw out of the pool based on their use of milk relative to market average use. Producers participating in the pool receive identical uniform blend prices, with adjustments for butterfat content and location of the plant to which the milk is delivered.

Processors: Dealers who commonly purchase raw milk then sell pasteurized milk and milk products.

Robotic parlor: A completely automated system for milking cows that requires limited human contact.

Separator: A centrifuge device used to remove fat from milk. Formerly used on the farm, but now used primarily at processing plants.

Service: A term that is used to describe the event of artificial insemination.

Short-bred heifer: A heifer that is confirmed pregnant and has been pregnant for 0-6 months.

Silage: A type of moist feed prepared by chopping green forage, kept in airtight silos and fed to cattle.

Silo: A storage facility for silage.

Sire: Father or male parent in a pedigree.

Skim milk powder (SMP): Obtained by removing water from pasteurized skim milk. Contains 5% moisture, 1.5% butterfat and a minimum milk protein content of 34%.

Somatic-cell count: The number of white blood cells (leukocytes) per milliliter of milk. A high concentration of somatic cells indicates possible mastitis infection.

Springer: A heifer that is within 2-3 months of calving.

Stall: A cow-housing cubicle.

Teat: The appendage on the udder through which milk from the udder flows.

Total mixed ration (TMR): A feeding system in which all forages, concentrates, vitamins and minerals are thoroughly mixed and fed as a single ration.

Throughput: The number of cows that can be milked in a parlor within a given period of time.

Udder: The mammary gland of cows where milk is produced.

Whey: Watery liquid that is left over when milk forms curds.

Whole milk powder (WMP): Obtained by removing water from pasteurized, homogenized whole milk. Contains 26-40% butterfat, no more than 5% moisture and typically less than 27% protein.