Dairy cows turn grass and grains into milk. Heifers are female dairy animals that have not given birth to a calf. Once a heifer gives birth, it is called a cow. All female dairy cows must have a calf to produce milk. The gestation (pregnancy) period for cows is nine months—just like humans! Newborn calves weigh 80-100 pounds.

Milk is an important part of a healthy diet. Milk provides your body with calcium, which is needed for healthy bones and teeth. Milk products also provide us with carbohydrates, protein, and Vitamin D. You should have three servings of milk and milk products every day.

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**MILK PROVIDES 13 ESSENTIAL NUTRIENTS**

- **CALCIUM** Helps maintain strong bones
- **POTASSIUM** Helps the heart pump blood
- **PHOSPHORUS** Helps build bones & teeth
- **PROTEIN** Helps preserve & build muscle
- **VITAMIN A** Helps eye health & vision
- **VITAMIN D** Promotes bone growth
- **VITAMIN B12** Helps maintain brain function
- **NIACIN** Helps body function normally
- **VITAMIN B2, B5, D3, ZINC, SELENIUM & IODINE**

**ESSENTIAL NUTRIENTS**

- **VITAMIN B2, B5, D3, ZINC, SELENIUM & IODINE**

**Technology on the Farm**

Advances in technology have helped farmers to make smarter day-to-day decisions to improve cow health and efficiency on the farm.

Automated cow feeders provide nutrition for calves several times a day. These feeders can adjust for the animal’s age, helping calves grow faster and stay healthier.

Computer-controlled and robotic milking equipment is able to identify the cow, sanitize the udder, collect the milk, and release the cow when she is done milking.

Milk yield recording systems provide the farmer with data for each individual cow. Farmers can monitor how much milk the cow is producing, among many other things. This information helps farmers spot changes in an animal’s health and allows them to provide necessary care quickly.

Activity monitors, such as tracking collars, monitor each animal’s activity. These collars can detect abnormal activity changes that might be early warning signs of illness or infection.

Genetic samples can be obtained from a cow’s blood, hair, or tissue. These samples are sent to a lab that creates a genomic report. The farmer uses this information to make decisions to increase milk production while minimizing the number of animals needed on the farm.

**VOCABULARY**

**BULL:** male dairy animal used for breeding

**CALCIUM:** a mineral found in dairy products that is needed for healthy teeth and bones

**Calf:** cattle less than 3 months of age

**COW:** a female dairy animal that has given birth to a calf

**CUD:** partially digested food that is regurgitated from the first compartment in a cow’s stomach into the mouth to be chewed again

**DAIRY:** food group containing milk and milk products

**HAY:** grass, clover, or alfalfa that is cut, dried and baled, or hay with the stalks and leaves that is chopped and fed to cattle

**HEIFER:** female dairy animal that has not had a calf

**HERD:** a grouping of cows that has given birth to a calf

**MILKING PARLOR:** area on the farm where the cows are milked, sometimes with the help of robotic milking machines

**PASTEURIZATION:** process of heating and cooling milk to kill bacteria and protect its purity and flavor

**PASTURE:** land covered with grass and other low plants suitable for grazing animals

**SILAGE:** fermented corn, wheat, or hay with the stalks and leaves that is chopped and fed to cattle

**STEER:** male dairy animal not used for breeding

**UDDER:** female dairy animal not used for breeding

**HOMOGENIZATION:** process where milk fat is broken into tiny particles that are evenly spread throughout the milk

**MILK:** a nutrient-rich liquid that comes from female mammals

**Silage:** fermented corn, wheat, or hay with the stalks and leaves that is chopped and fed to cattle

Just like us, dairy cows need to eat well too! A 1,500 pound dairy cow eats 100 pounds of feed every day. Their diet is called Total Mixed Ration (TMR) and includes corn silage, hay, ground corn, soybean meal, and vitamins and minerals. Dairy farmers work with veterinarians and feed specialists to make sure their cows are eating a healthy diet. Dairy cows also drink about thirty to fifty gallons of water a day. That is about an entire bathtub full of water!
Dairy cattle are called ruminants. Unlike humans, they have a four-compartment stomach to digest their food. The four compartments of a cow’s stomach are the rumen, reticulum, omasum, and abomasum.

**#1: Rumen**
The rumen is basically a large storage bin that can hold up to 50 gallons! Microorganisms in the rumen begin to break down and digest whatever the dairy animal eats.

**#2: Reticulum**
The reticulum is the second compartment. It catches food that is too big and needs to be broken down more. This causes the cow to regurgitate the wad of food back up the esophagus and into the mouth to be re-chewed. This is called “chewing the cud.”

**#3: Omasum**
In this compartment, most of the water from the food is absorbed.

**#4: Abomasum**
The abomasum is very similar to a human’s stomach. Stomach acids and other enzymes break down the food even further before sending what is left to the intestines to complete digestion.

Did you know?

- The U.S. dairy industry has decreased water usage by 65% over the past decades. Water used to clean milking parlors is reused to clean alleyways and irrigate fields.
- 80% of a dairy cow’s diet comes from plant fibers and feedstuffs that they can digest but humans can’t.
- Some dairy farms use anaerobic digester systems that convert manure into clean, renewable electricity, which can power their farms, their homes, and their communities.
- The latest research shows that the U.S. dairy industry accounts for just 2% of U.S. greenhouse gas emissions. Dairy farmers are working to reduce that figure even more.
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Holstein dairy cows in a freestall barn. This provides them a clean, dry, and comfortable resting space.

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**Rumination NAVIGATION**

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**Fun Fact:** Dairy cattle spend up to 8 hours every day chewing their cud!

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**FARM to Table**

Ever wonder how milk gets from the farm to your table? There are many important practices dairy farms use to provide excellent care to their dairy animals while also producing high-quality, safe, and healthy milk that we use every single day.

**KEEPING COWS HEALTHY**

- By adopting best management practices, such as climate-controlled barns, milking sanitation, and regular veterinary care, dairy farmers increase the well-being of their cow herd by reducing the risk of disease and infection.

**STRONG ON-FARM MILKING PROCEDURES**

- Today, human hands never touch milk as it travels from cow to consumer. A cow’s teats are cleaned before and after milking to minimize the chance bacteria is transferred to milk. Equipment is also cleaned after each milking. Some dairy farms even use robotic milking machines to ensure safety procedures are done and to better track data for each cow’s milking performance.

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Most dairy farmers live and work on their farms. They protect the land, water, and air not only for their animals, but also for their families, the surrounding community, and future generations. Dairy farmers are dedicated to innovation and conservation practices to make their farms more sustainable. Advances in cow care, nutrition, genetics, and technology have had big impacts on dairy farm sustainability over the years.
**MILK**

Milk comes in a variety of types. Types of milk vary based on the percentage of milkfat, or the amount of fat that is in the milk by weight. The main types of milk are whole milk (3.25% milkfat), reduced-fat milk (2%), low-fat milk (1%) and fat-free milk, also known as skim milk.

**CHEESE**

Cheese is another nutritious food made from milk. The average American eats over 37 pounds of cheese each year. There are many different varieties of cheese, and cheese can be found in many of our favorite foods. Mozzarella and cheddar are the two most popular types of cheese in the United States. Do you have a favorite type of cheese? What is your favorite way to eat cheese?

**YOGURT**

The two main ingredients in yogurt are milk and bacterial cultures. Milk strengthens our teeth and bones while the cultures help fight infection and boost our immune system. Yogurt is a fun way to add calcium to your diet. There are many different varieties and flavors of yogurt to enjoy!

**ICE CREAM**

Ice cream is a very popular dessert. At any given time, 87% of Americans have it in their homes! Milk and cream are the main ingredients in ice cream. It takes 12 pounds of whole milk to make 1 gallon of ice cream. Most Americans prefer vanilla over any other flavor. What is your favorite flavor?

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**PASTEURIZATION**

Pasteurization involves heating, then rapidly cooling raw milk. This step is very important for the continued production of safe milk. Some milk is “ultra-pasteurized” by heating the milk to an even higher temperature. This process allows milk to stay fresh and safe for a very long time. The Food and Drug Administration and the Centers for Disease Control recommend drinking only pasteurized milk. Pasteurization is a simple, effective method of killing harmful pathogens that has been around for well over one hundred years!

**BOTTLING AND DELIVERY**

Milk is then bottled in various container sizes and shipped to restaurants, schools, grocery stores, and other consumers. Typically, the whole process takes two days to get the milk from the cow to the grocery store, and then into your fridge!
Can you describe your dairy operation?
Our dairy farm is located south of Greenville, IL. We (Amy and Beth) are seventh-generation dairy farmers. Our family came from Switzerland in 1842 and brought a Jersey calf with them! We milk 110 Jersey cows and raise all our young stock on our farm. We rotationally graze our cows and our cows have access to pasture year-round. In 2010 we opened our creamery to process our cow’s milk into cheese. The Creamery and Robot Barn were built with viewing windows so that visitors can watch cheese being made and watch our robotic milkers as they milk the cows!

How did you get into making cheese on your dairy farm?
We decided to make cheese with our cow’s milk because of the high quality milk of our Jerseys. We currently make 20+ cheeses including fresh cheeses like fresh cheese curds, farmstead cheeses like Gouda, White Cheddar, and Havarti. We also have a cheese aging room modeled off a man-made cheese cave in Switzerland. Our cave-aged cheeses include Tomme, Alpine and Heritage. Our cheese cave stays at 50-55 degrees nearly the entire year and is the perfect environment for aging cheeses.

In what ways are you trying to make your farm more sustainable?
Sustainability is very important to us. On our farm we try to meet our needs without compromising the needs of future generations. For us, zero waste is always the goal! We use the cows’ manure to fertilize our pastures. We use whey from our cheese to feed our animals and make Extreme Ice. We also added a geothermal heating system for our creamery to lower our energy use.

Can you describe your job?
I am responsible for overseeing all aspects of our development process from concept to commercialization. That includes everything from the recipe to the equipment we use to make and fill the product, all the way to the finished package you find on your grocery store’s shelf. I am fortunate to wear many hats, as we say, and am also a Corporate Engineer for five of our manufacturing plants. In addition, I manage one of our National Accounts. There’s never a dull moment and I wouldn’t have it any other way!

Why are jobs like yours important to the dairy industry?
The cows do the hard work—making nutritious and delicious milk. Jobs like mine make sure we can maintain that quality by packaging it in a safe and convenient way for consumers like you and I to enjoy.

What classes/subjects in school helped prepare you for your current position?
I grew up on a dairy farm, so I was familiar with having to solve problems on the fly when something would break down or not operate as planned. I earned a bachelor’s degree in Chemical Engineering, which is also known as process engineering. This directly correlates to the operations of our manufacturing plants with things like piping, instrumentation, flow, mechanics, etc.

What is the most exciting/interesting thing about your current role with Prairie Farms?
With my dairy upbringing, I have a deep-rooted passion to invigorate the industry with exciting and innovative products. I love that I work for farmers and that no two days are the same.

Ingredients

- 1 cup rock salt
- 1/2 cup sugar
- 1 teaspoon vanilla extract
- 1 cup milk
- 1 cup whipping cream
- Crushed ice

Directions

1. Put the milk, whipping cream, sugar, and vanilla in a 1 quart freezer bag and seal. For security, fold a piece of duct tape over the seal.
2. Place the bag with the ingredients inside a gallon freezer bag.
3. Pack the larger bag with crushed ice around the smaller bag. Pour 1/2 to 1 cup of salt evenly over the ice.
4. Wrap in a bath towel and shake for 10 minutes. Open the outer bag and remove the inner bag with the ingredients. Wipe off the bag to be sure the salt doesn’t get into the ice cream.
5. Cut the top off and spoon into cups or cones.

Enjoy plain or top with nuts, coconut, or fruit!