Got Milk? How?
Dedicated to dairy farmers everywhere, for the many hours spent working in the barn and fields, from dawn until dusk, or even later.
It is milking time at Donlon Dairy Farms.

I’m Emily and my mom works for Jim and Greta Donlon. It’s her job to feed the calves and make sure they are healthy. There are lots of jobs on a dairy farm.

First, I want to show you the milking parlor and all the cows.
The Donlons have Holstein cows, well known for their black and white coloring. Holsteins can actually have black and white markings or red and white markings. Most dairy farms in the United States have Holstein cows.

Holsteins weigh about 1500 pounds and stand around 58 inches tall. A Holstein cow can give up to 18 gallons of milk per day. An average cow gives six to seven gallons of milk per day. Most dairy farms milk two times per day, but some dairy farmers milk three times a day.

A cow does not produce milk until she has given birth to a calf. Before she has her calf she is called a heifer. Most heifers have their first calf when they are about two years old.

Cows produce milk to feed to their calves. Cows produce more milk than the calves need. Dairy farmers collect and sell the extra milk produced by the cows.
When the cows come into the parlor, the cows' udders must be cleaned before they are milked. A cow's udder is between her back legs, and it has 4 teats. The udder is where the milk is produced and stored.

The cows have a small amount of milk stripped from their udder, a worker gently squeezes each teat to get a squirt of milk. This process is to check for infection that could make the cow sick or the milk bad.

Then the cows' teats are dipped with an antibacterial solution and dried off with a towel.

Keeping things clean is important in the parlor. You’ll see the workers wearing blue gloves to help stop the spread of bacteria. Workers also wash milkers if they fall on the ground or get dirty.
The next step is to put the milking machine onto the cow. There are four rubber cups, one for each of the cow’s teats.

Milking machines, often called milkers, use a vacuum that mimics the sucking of a calf. There are two hoses connected to the milkers, the green one carries milk and the other is attached to the vacuum. Milk travels from the green hose into the pipeline where it is filtered and pumped into the bulk tank. I’ll show you the bulk tank later.

When the cow has given all her milk, in about five minutes, the milker is taken off and her teats are dipped again to prevent infection.
In a parlor, the cows are on a platform that is higher than where the workers stand. It allows the workers to see the cows' udders and saves them from bending down over and over. I’m not quite tall enough to reach the cows, so I help with the calves.

At Donlon Dairy Farms, the parlor holds 12 cows on two sides. At one time 24 cows can be in the parlor and milked. It takes two and a half hours to milk around 250 cows.

One of the workers chases 12 cows into the parlor. A gate that keeps the cows in the parlor while there are milked. After the cows are milked, the workers open the gate and the cows are free to leave the parlor.
The orange arrow points to the string attached to the milker. The blue arrow points to the part of the takeoff that pulls up the milker to keep it clean and safe from being stepped on.
Dairy farms have lots of technology. One kind of technology at Donlon Dairy Farms is called an automatic takeoff. It’s a machine that senses the milk flow and turns the suction off when the cow stops giving milk. A string is attached to the milker, and it pulls the milker up to keep the milker from getting dirty or stepped on.
Above, the orange arrow points to the pipes that carry milk to the bulk tank. At right is the filter that strains the milk. At the far right is the bulk tank.
Milk travels through a filter and a series of pipes to the bulk tank. Milk is about 100° when it comes out of the cow, but it is quickly cooled to 40°. Milk is kept cold at the dairy farm to keep it from spoiling, just like you keep milk in the refrigerator. Milk is kept in the bulk tank until it is transported to the creamery to be bottled or processed into cheese.

A bulk tank is like a huge refrigerator just for milk. This one at the Donlon’s holds 3000 gallons of milk! Compare that to your family’s refrigerator which can hold about 20 gallons.
This is a milk truck. Milk must go to the creamery every day or two to be bottled or processed into cheese, otherwise it will spoil. Every day milk is picked up at Donlon Dairy Farms.

At the creamery, milk is pasteurized to kill any bacteria and then put into jugs and cartons to be sold. Some milk is made into cheese, butter, yogurt and my favorite dairy product, ice cream.
Keeping everything clean is a daily job on a dairy farm. Bacteria can grow on anything that has touched the milk if it isn’t cleaned right away. Bacteria could make people sick, just like cold and flu germs.

When the herd has been milked, the milkers are cleaned off on the outside and connected to these platforms that will sanitize the inside. Very hot water with soap is pumped through the milkers and pipelines to sanitize them.

Even the bulk tank is cleaned and sanitized after the milk is pumped into the truck to be delivered to the creamery.
Another area that is cleaned everyday is the barn. The Donlons have a free stall barn, where cows are inside but can move freely around to eat, drink, exercise and rest.

The cows are kept cool, clean and comfortable. The temperature is controlled with vinyl walls that can be raised or lowered to allow air flow. There are also large ceiling fans and misting water to cool the cows in extremely hot weather. Automatic scrapers constantly clean manure from the floor.

To keep the cows comfortable when they sleep, the Donlons provide wood shavings and mattresses where the cows lay. The mattresses are made of recycled rubber tires. The wood shavings must be replaced at every milking. The best time to do this is when the cows are at the milking parlor; that’s Great Donlon replacing the wood shavings.
If you have pets at home, you know how important it is to give them food and water every day. Dairy cows have the same needs.

Every morning Jim Donlon mixes up huge batches of food for the dairy cows and some for the young heifers, too. The TMR, which stands for Total Mixed Rations, is the blue machine behind the tractor. The TMR is used to measure the amount of haylage, silage, corn, and even vitamins and minerals. Then the TMR mixes these ingredients together like a blender. Finally, Jim drives the TMR to the barn and spreads the mixture for the dairy cows to eat.

Hay is dried plants such as alfalfa, clover, and grasses. Ensiling is another way to store alfalfa and the whole corn plant; the resulting products are called haylage and corn silage. One way to tell the difference is that silage is wetter than hay.
Producing milk takes lots of energy, so cows eat a lot. Every day a cow eats about 20 pounds of corn, 20 pounds of haylage, and 20 pounds of corn silage. There is also free choice hay, so the cows can eat hay when they want and as much hay as they want.

A cow drinks between 30 and 40 gallons of water a day. Compare that to an average bathtub, it can hold between 40 and 60 gallons of water.
The four-part stomach of a cow. The red shows the path of the food the first time a cow swallows, and the blue shows the path of the food after she chews her cud.
One thing many people say is that cows have four stomachs. That is not true, but cows and other ruminate animals have very specialized stomachs. Grass and other plants have thick cell walls that are hard to digest. The cow’s stomach has four compartments and uses bacteria and yeast to help digest grasses.

Cows eat much of their meal quickly without much chewing. Cows don’t even have incisors, the front teeth, on the upper jaw. The food goes into the rumen, which is like a storage compartment. The beginning of digestion starts with bacteria breaking down carbohydrates into simple sugars and starches.

The food eventually passes into the reticulum and the food is formed into small balls called cud. Later the cow regurgitates the food and chews her cud.

The food passes back through the rumen and reticulum into the omasum, which removes water from the food. The fourth compartment is the abomasum and is sometimes called the true stomach because it is much like our human stomachs.
Calves are baby cows, and can be male, bulls, or female, heifers. Calves weigh 80 pounds when they are born. Calves can walk within an hour of their birth. At Donlon Dairy Farms the heifer calves are kept to replace old cows once the heifer grows up. The bull calves are sold and raised for meat.

The calves have to be fed every day too. Young calves drink milk just like human babies. As they grow, the calves begin to eat grain and hay.

I help my mom feed the young calves. I enjoy feeding bottles to the calves. These bottles hold two quarts of milk. As the calves grow, many drink the milk straight out of a pail.
These calves have been weaned, so they no longer drink milk. They are around two months old. Now they eat grains such as corn and oats as well as free choice hay.
Glossary

Abomasum: the part of the stomach where acids help digest food in a ruminate animal.

Automatic scrapers: metal shovels attached to a motor, used to push manure off the cement where cows walk and live.

Bacteria: organisms too small to be seen by the naked eye, that can help or cause harm to the body.

Bulk tank: a large stainless steel tank that holds and refrigerates liquids, like milk on a dairy farm or at a creamery.

Creamery: a business where milk, butter and cheese are prepared and sold.

Ensiling: a storage process for preserving alfalfa and grasses.

Filter: a paper or cloth with tiny holes to remove unwanted parts of a liquid or gas.

Heifer: the female offspring of domestic cattle, especially before giving birth to a calf.

Manure: waste produced by animals.

Omasum: the part of the stomach that removes excess water from food in a ruminate animal.

Parlor: a specialized room for milking where cows stand on a platform that is higher than the workers.

Pasteurize: to heat liquid, especially milk, to a high heat and then quickly cool in order to kill bacteria.

Regurgitates: partially digested food is forced out of the stomach back to the mouth.

Reticulum: the area of the stomach where the cud is formed in the digestive system of a ruminate animal.

Rumen: a large storage area in the digestive system of a ruminate animal.

Ruminate: a grazing animal with a specialized digestive system; examples include cows and sheep.

Sanitize: to remove bacteria or other undesired dirt from equipment.

Teats: the finger-like structure extended from the udder, through which milk is removed.

Udder: the bag-like structure that hangs below the cow where milk is produced and stored.
Works Cited


Donlon, James. personal communication. 8 Nov. 2009.


Kettlekamp, Bob. personal communication. 2 Dec. 2009.


