

From Cows to Cartons

A Look At Milk

Reading and Discussion

Do you get up in the morning and eat a bowl of cereal? Do you add milk from a carton or a plastic jug? And do you ever wonder how the milk got from the cow into the carton?

Milk is considered a perfect food. It contains every element babies need for building healthy bodies, good teeth, and strong bones. It is good for people of all ages. Milk has the **calcium** and **vitamins** our bodies need. It is full of protein, fats, minerals, and carbohydrates that are essential to our health. It is easily digested. In fact, milk is the only “fat” babies can digest. In the USA, the dairy industry is considered one of the most important industries of all.

All About Cows

A baby cow is called a **calf**. After two years, calves are considered cows and are ready to have their own calves. They do not produce any milk until they have their first calf. After that, most cows will produce milk for about four years.

Dairy farmers need lots of good pastureland to graze their cows in spring, summer, and fall. A cow can eat almost two acres worth of pasture grass in a five-month summer. Cows drink about eight gallons of water every day; a pond in the pasture is handy to have! Cows cannot tolerate too much cold weather and they spend winters in the barn.

Many years ago, when cows had only hay to eat in the winter, they would stop producing milk until they were able to eat grass in the pasture again. When farmers started feeding them **grain** in the winter months, they started producing milk all year round. This was a great discovery for the early settlers, even though it was expensive to buy grain for feed. Now they could have fresh milk and butter even in winter.

The **vitamin** and **mineral** content of milk is determined by what a cow eats. A diet of fresh green grass and plants, like alfalfa and clover with plenty of sunshine for vitamin D, will produce the highest quality milk. What cows eat goes into their milk!

Once a cow starts giving milk, she must be milked 2 or 3 times every day for 300 days. They liked to be milked! Cows don't take holidays or weekends off, but after 300 straight days of milking, they go into a dry period for 65 days. They are often put out to pasture during this time, before the milking starts again.

Kinds of Cows

Some cows are raised for milk, and others for beef. The popular milking cows are **Holsteins**, **Jerseys**, **Guernseys**, and **Shorthorns**. Holsteins produce the most gallons of milk per cow, but it is lowest in butterfat. Jersey and Guernsey cows produce fewer gallons, but their milk is high in butterfat content. Butterfat is the “fat” content in milk. It is used to make butter and it gives milk its richness and flavor.

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Many farmers mate different breeds of cattle together. These cows are called “grade” cows. Records are kept on each cow stating how much milk she gave, what the fat content was, and how much protein was in the milk. Then the best mixed breeds are mated for maximum production.

Then & Now

Before the 1800’s, most families kept their own cow for their milk and butter. Milk didn’t travel too far. At that time, towns were growing and the farmers packaged their milk and brought it to the towns to be sold. By the middle of the 1800’s, large cities had developed and milk and milk products had to be shipped even further away into these cities. Soon, creameries were built in the cities to process and package milk there.

The demand for milk got so big that milking machines were invented. They have taken the place of hand milking on many farms. Where it used to take one hour to milk six or eight cows, now hundreds can be milked in that time. The cow’s udders are attached to the machine and the machine pumps the milk from the udders. The pump sends the milk through hoses, which empty it into a holding tank. The tank must be able to keep the milk cold. Milk should be kept **below 60° F** from the moment it leaves the cow.

Every day, a truck with a tanker trailer comes to pick up the milk. It is pumped from the farmer’s tank into the tank on the truck. Even though this tank is insulated to keep the milk cold, the truck driver wastes no time in getting to the creamery. Here, a sample of the milk is taken into the lab. The sample is tested for quality and fat content. After the sample is tested and recorded, the milk is unloaded by being pumped off the truck and sent through hoses into the creamery’s tanks.

Keeping Milk Clean

Humans are not the only ones that think milk is a great product. Bacteria think so too, and they can grow very fast in milk. With all the machines and human handling involved with dairy products, it is very important to keep watch on cleanliness and temperature to avoid contamination by bacteria.

- ❖ Cows need to be checked for disease, and workers must be healthy and clean;
- ❖ Barns and milking equipment must be kept sanitary;
- ❖ Milking and transporting equipment should be sterilized after each batch of milk;
- ❖ Storage tanks must maintain cold temperatures.

Even when cows, people, and machinery are kept very clean, bacteria can get into food. Bacteria are in the air and they are eager for a nutritious place, like warm milk, to live and multiply.

A Very Smart Cookie

One of the reasons we can keep milk and other food products longer than in the past is refrigeration. Another reason is the wonderful research by a Frenchman named **Louis Pasteur (1822 –1895)**. Pasteur was responsible for many medical and scientific

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discoveries that stopped the spread of disease. His work made surgery safer, saved silkworms from a parasite, cured rabies, introduced vaccinations, and helped with the study of tuberculosis, tetanus, and other diseases. Along with these, he made the important connection between **bacteria** and **fermentation**. He proved that an airborne germ (bacteria) caused fermentation, and that it could be killed and controlled.

Pasteur found that heating milk to about 147° F for 30 minutes could kill any harmful bacteria in it. Then, chilling it to 50° F or less, and keeping it cold until use, would keep the bacteria from multiplying again. This process, used today in various forms, is called ***pasteurization*** after Louis Pasteur.

Today, milk is *pasteurized* at the creamery, and then ***homogenized***. *Homogenization* is a process that breaks up the fat globules that rise to the top of milk. Homogenized milk has been pressurized and pushed through valves or screens to distribute this fat evenly into the milk for drinking. This is called *homogenization*.

Summing Up

As you can guess, many jobs go along with the production of milk and other milk products.

- ❖ **Dairy farmers** & workers keep cows and operate the farm. Clean, clean, clean!
- ❖ **Truck and Train drivers** pick up, transport, and deliver milk and products.
- ❖ **Creamery workers** prepare milk, butter, ice cream, cheese, etc., and bottle or package the products.
- ❖ **Factory workers** make the packaging for milk products.
- ❖ **Chemists and Scientists** conduct research and perform laboratory work.

Dairy farming has become quite an industry. Still, most of us buy our groceries, including milk, at a store, on a street, in a town or city. We live far away from farms. This makes it easy to forget about where our food actually comes from. It is important to think about it sometimes, though, and learn! After all, we will always need the products that come from those farms.

Name _____

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Activities

Activity A: Choose the right word to fill in the blanks:

1. What a cow _____ goes into its milk.
 - a. Sleeps on
 - b. Looks at
 - c. Eats
 - d. Drinks

2. Cows only give milk after _____.
 - a. They are one year old
 - b. They have a calf
 - c. Eat a lot
 - d. Midnight

3. There are several breeds of cows. One breed is _____.
 - a. Brown
 - b. A milker
 - c. Holstein
 - d. Not enough

4. _____ were built when large cities grew and fewer people had their own cows.
 - a. More farms
 - b. Parks with big barns
 - c. Creameries
 - d. Dairy tunnels

5. _____ is when milk is pressurized and pushed through valves or screens.
 - a. Pasteurization
 - b. Processing
 - c. Creaming
 - d. Homogenization

Activity B: True or False Questions

1. Milk is the only "fat" a baby can digest. _____

2. Cows can only make milk in summer. _____

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- 3. Cows must be milked 2-3 times a day. _____
- 4. "Butterfat" happens when butter is added to milk. _____
- 5. Bacteria in milk can be killed by refrigeration. _____
- 6. Louis Pasteur was one of the greatest dairy farmers _____
- 7. Pasteurization is a way of making cheese. _____
- 8. The Frenchman, Louis Pasteur, discovered many ways to combat diseases. _____
- 9. Since farming is so out of style, there are not many jobs in the dairy industry. _____
- 10. We shouldn't think about how food gets into the grocery store, as long as we get to eat it! _____

Name _____

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Answer Sheet

Activity A

1. C
2. B
3. C
4. C
5. D

Activity B

1. T
2. F
3. T
4. F
5. F
6. F
7. F
8. T
9. F
10. F