

MONTANA

DAIRYS PROVIDE FOR YOU

FACTS ABOUT DAIRY COWS

The dairy cow was a part of homesteading in the West. Most people who settled in our state brought along a “milk” cow for the nutrition she could provide to those families – milk, cheese, butter, ice cream and more. Even people living in small towns would have had a milk cow. From these small numbers of dairy cows sprang the early local creameries, such as Springs Creamery or the Bitterroot Cooperative Creamery managed by John Howe in Stevensville, MT. As time passed and the work force changed, the small local dairy farmers started to go out of business and with them, the small creameries. Today Montana has about 75 dairy producers with any number of cows from 5 to 750. These 14,000 cows produce 288,000,000 pounds of milk per year.

Milk is a nearly perfect food. And it is produced by the cow doing a very important job – turning grass and grain into a product that people can eat. (We cannot eat the same grass and grain directly ourselves). There are many different breeds of dairy cows, each with their own characteristics like color, size and type of milk they produce. A Jersey cow gives more butterfat in her milk (which makes the really yummy ice cream!); whereas a Holstein (the traditional black and white cow) yields more milk but it has less butterfat. Other breeds include Guernsey, Brown Swiss and Ayrshire and others.

Cows do not give milk until they have a calf and they usually do that at the age of 22-24 months and then every year after that at that same time. The term “cow” is used to describe a female that has had a calf. A younger one is called a heifer before they have a calf. Cows are usually milked twice a day and many producers try to do that 12 hours a part – so, for instance, at 7:00 AM and 7:00 PM. Some farms milk their cows three times a day believing that increases milk production. Technology has arrived at the milking barn, like it has everywhere else, and some cows are even milked by robots! Most,

however, are milked by machines as compared to the hand milking of those early dairies.

A dairy cow eats 25 pounds of grain per day and she often eats grain while the machine is milking her udder (where the milk is stored). She also needs 25 pounds or more of very high quality alfalfa hay or hay/corn silage mix and 30-40 gallons of clean, fresh water every day. A good dairy cow will produce about 8-10 gallons of milk every day for about ten months; then the producer lets her rest before she has her next calf. This would mean that this cow has produced 21,000-27,000 pounds of milk per year (actually in those ten months).

Dairy cows are very well cared for. They need to be comfortable in order to be top producers of milk. Some dairies will have their cows grazing outside for part of the day; others have huge barns set up with controlled temperatures and the cows reside there. Did you know some dairy cows lay on mattresses? Bedding can also include sand, straw and even recycled tires! In order not to be directly on concrete all day, some farmers give their cows mats to lay and stand on – this makes them more comfortable and they give more milk!

Dairy barns must be kept very clean in order to help keep the milk safe to drink. So the manure that comes from the cows is cleaned away in very quick fashion usually by a tractor or some other automatic machine. Most manure goes into pits in the ground and it is processed from there. One dairy farm in northwest Montana makes several products from their dairy cows’ manure – fertilizer, both liquid and solid, and also electricity! Read about their “methane digester” at www.hulsdairy.com.

As the cows are milked in the milking barn (or” parlor” as it is sometimes called), the milk flows through clean, stainless steel pipes into refrigerated tanks where it is stored at a cool temperature (38 degrees). Special tanker trucks pick up the milk and transport it to the processing

plant where it is made into the many different dairy foods that you buy in the grocery stores. Those tank trucks are the very shiny, clean looking ones that you may have seen on Montana highways. They also keep the milk at a safe temperature during transport. Milk is tested at the processing plant for bacteria, components (butterfat and protein) and to ensure that there is absolutely no antibiotic residue, so that we are assured it is healthy in all respects. If a cow becomes ill or gets an infection in her udder, her milk does NOT go into the food system. Robots and trained personnel can test the cow’s milk before she is milked. The robot sends a message to the producer if the milk is not perfect and he routes that cow’s milk to a different place that is not used for people.

Montana’s milk is divided into three categories – Classes I, II, and III. Class I milk includes the milk we drink on a daily basis such as homogenized milk, buttermilk and chocolate milk. Class II milk includes cottage cheese, sour cream, all types of ice cream and mixes, eggnog, and yogurt. Class III includes hard cheeses, butter and cream cheese. The biggest Class is Class I. The farmers are paid by the hundredweight (per one hundred pounds) and the price is determined by the state of Montana and the Milk control board.

The amount of milk used to manufacture different products varies. One pound of cheese requires ten pounds of milk because milk is mostly water and the cheese-making process removes most of the water. It takes about 21 pounds of milk to make one pound of butter, depending on how much butterfat is in the milk.

There are presently three milk processing plants in Montana – Bozeman, Great Falls, and Billings. The cost of transporting the milk to these plants is very high for the farmers because of the distances.

HOMEMADE ICE CREAM IN A BAG

INGREDIENTS:

- | | |
|-----------------------|----------------------------|
| 1 Cup Half and Half | Approx 4 cups Ice cubes |
| 2 TBSP White Sugar | 1 gallon sized zip top bag |
| 1TBSP Vanilla Extract | 1 quart sized zip top bag |
| ½ Cup Rock Salt | |

Mix half and half, sugar, and vanilla together in Quart sized bag. Seal the quart sized bag. Place 2 cups ice and rock salt in Gallon sized bag. Place Quart sized bag in Gallon sized bag and cover with remaining ice and seal Gallon sized zip top bag.

MAKE SURE BOTH BAGS ARE SEALED COMPLETELY.

Now, shake the gallon sized bag for 5 minutes... Keep the bag moving for the entire 5 minutes. You may want gloves to do this part. Check the Quart sized bag after the five minutes the contents should be creamy and solid. Once it is the texture you like for ice cream, remove the quart sized bag from the Gallon sized bag, dish into a bowl (should serve 2 -3), add toppings as desired, and enjoy!



BOTTLE FEEDING DAIRY CALVES.

Agriculture in Montana Schools is proud to be supported by the following organizations!



Let's Learn About Montana Agriculture!

HISTORY OF MILK

Milk has been a part of our nutrition since time immemorial. Rich in nutrients, milk in its various forms has a long, long history...

- Around 10 000 BC, the "agricultural revolution" occurred changing societies from nomadic tribes to those who settled in communities. With this came domesticated animals and the ingenuity for people to use by-products such as milk.
- In ancient Egypt, milk and other dairy products were reserved for royalty, priests and the very wealthy.
- By the 5th century AD, cows and sheep in Europe were prized for their milk.
- By the 14th century, cow's milk became more popular than sheep's milk.
- European dairy cows were brought to North America in the early 1600s.
- Louis Pasteur, a French microbiologist, conducted the first pasteurization tests in 1862. Pasteur is credited with revolutionizing the safety of milk and, in turn, the ability to store and distribute milk well beyond the farm. Commercial pasteurization machines were introduced in 1895.
- In 1884, the first milk bottle was invented in New York State.
- In the 1930s, milk cans were replaced with large on-farm storage tanks, and plastic coated paper milk cartons were invented, which allowed for wider distribution of fresh milk.

www.dairygoodness.ca/milk/the-history-of-milk

BREEDS OF DAIRY COW



HOLSTEIN



JERSEY



BROWN SWISS



AYRSHIRE

WORD SEARCH

Find and circle all of the words that are hidden in the grid.

B B X Z R T E A J E L V S J N
 C U P I D A H Y M C A U E U O
 H D T I U J W R Z S D R M I I
 E C F T J N I S M E S A X F T
 E T T G E D U H Z E E C R D A
 S E R D U R Y I Y R B I Q R Z
 E Y C U Y E N R C Z E Z B U I
 A F H D G E R E E S T I G C R
 I G F Q G O C N I M K F N W U
 L Y Z O M I Y A S A A J I L E
 I X M M A Z N E I E V E N T T
 H O N I E T S L O H Y V R C S
 H Z Z R E F I E H C P A U C A
 M S N C I N S U L I N Z H L P
 R S I N S U L A T E D I C E P

AYRSHIRE

BUTTER

CHEESE

CHURNING

CREAMERY

CURD

FRIESIAN

GUERNSEY

HEIFER

HOLSTEIN

HOMOGENIZED

ICECREAM

INSULATED

INSULIN

JERSEY

PASTEURIZATION

YOGURT

SOLUTIONS:

4 7 3 6 0 7 6 4 7 0 8 5 8 5 2
 4 7 4 2 8 6 7 0 5 8 5 0 8 5 4
 5 0 4 4 0 4 4 7 8 5 5 0 2 4 4
 4 0 2 1 8 4 4 0 7 8 5 0 2 4 4
 6 5 8 7 1 1 6 7 8 2 4 4 8 5 6
 7 5 6 4 4 8 4 4 4 4 4 4 4 4 4
 4 8 8 5 8 8 5 8 4 0 5 5 5 5 5
 2 7 0 6 5 5 7 7 2 2 4 4 4 4 4
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 4 8 5 1 4 7 7 6 7 5 2 2 4 4 4
 4 8 5 1 4 7 7 6 7 5 2 2 4 4 4

VOCABULARY

BUTTER // a solid, yellow, fatty food made by the churning of milk or cream.

CARING AND FEEDING // Dairy farmers provide the right amount of nutritious food, plenty of clean water, and bedding.

CHEESE // a food made from milk usually by separating out the curd and molding it.

CHURNING // a process of extended stirring which separates the solids in milk from the liquid. Butter is the result.

COTTAGE CHEESE // a very soft cheese made from soured skim milk.

COW // a bovine that has had at least one young, or calf.

CREAMERY // an establishment where dairy products are prepared or sold.

DAIRY // a type of farm or establishment that has to do with the production and processing of milk and its products. The milk can be from sheep or goats, but most commonly from cows.

HAY // herbaceous plants (grasses and alfalfa) cut and dried to use as animal feed later on when the plants are no longer growing. Hay can vary in quality, so hay for dairy animals is tested for protein and other nutrients. This way the farmer can be sure his cows are getting proper nutrition to make the most milk they can and that the cows are healthy.

HEIFER // a young bovine that has not had a calf yet, usually under three years old, commonly less than two years old.

HOMOGENIZED // what happens to milk by a process that the fat particles in the milk do not separate and rise to the top. A bucket of milk fresh from a cow will have the cream (or fat in the milk) rise to the top. Homogenized milk does not do this.

LACTOSE // The sugar naturally occurring in milk is lactose. Some people may be allergic to this sugar and need to drink lactose-free milk. It is still from the dairy cow and still contains the excellent nutrition.

METHANE DIGESTER // A system that turns manure into electricity.

NUTRITION OF MILK // Milk is 87% water and 13% solids. It contains important nutrients, including calcium, Vitamin D, potassium, and protein.

PASTEURIZATION // a process that milk goes through at a high temperature to destroy harmful organisms but does not change the chemistry of the milk.

SANITATION // Milk and dairy products undergo numerous safety, quality and cleanliness checks. Milk is among the most highly-regulated and safest foods.

INTERESTING AND FUN WEBSITES THAT PERTAIN TO DAIRY AND DAIRY FARMS:

www.facebook.com/montanadairyfarmers

www.hulsdairy.com

www.dairygoodness.ca/milk/the-history-of-milk

