

HISTORY

Until the last decade of the 19th century, farmers in Manitoba produced milk to feed their families and would sell any surplus to a local purchaser, usually a neighbour or local store owner.

In 1880, the first strictly dairy herd in Manitoba was created. It consisted of Ayrshire cows. Before long, cheese factories and creameries opened in developing communities settled by European immigrants.

From then to now, a lot has changed in the dairy farming industry. For instance, an industry that once relied solely on milking by hand now incorporates different milking systems, such as automated milking.

All dairy farms in Manitoba are family owned and operated.

A DAY IN THE LIFE OF A DAIRY FARMER

A dairy farmer takes on many roles at their dairy farm. Dairy farming also includes being a:

- **Cow chef**, regularly working with professional dairy nutritionists to monitor what cows are eating. Cows are usually fed a mixture of hay (grass and alfalfa), grains (such as corn or barley), and silage (fermented corn, alfalfa, and grass). Dairy cows are also fed protein and mineral supplements to ensure they have a balanced and nutritious diet.
- **Veterinary technician**, always monitoring cow health and working closely with veterinarians.
- **Mechanic**, who understands the operations of all farming equipment and knows how to fix it if something goes wrong.

And of course, dairy farmers also manage the milking of their cows. Many use an automated milking system (see Production).

In summer, the farmer also grows the feed that the cows eat all year round. Most farmers grow silage, grain, and enough straw and hay to last the year.

PRODUCTION

After dairy cows give birth, the calf stays with the mother for a few hours while the farmer makes sure both cow and calf are healthy. Dairy farmers care for their calves in an area separate from their mothers to ensure the best individual care and prevent disease transmission between the animals.

Calves are fed **colostrum**, the first milk from their mother. Colostrum is rich with antibodies that protect the calf from diseases until its own immune system becomes functional. Farmers make sure colostrum doesn't go into the **bulk tank** where milk for human consumption is collected during milking.

For the first two or three months of their lives, a newborn calf is housed in a hutch or in a calf barn.

- **Hutches** (individual housing) are shelters that look like small sheds. Other calves are always nearby and within sight. Clean, dry hutches ensure calves have ample space to move about, and protect them from bad weather and disease while they are building immunity — the time they are most vulnerable to sickness.
- **Calf barns** are barns housing calves only. Calves are housed either in pairs or small groups in this area.

Female baby calves are called **heifers**. Once a heifer has a calf and starts producing milk, she is called a **cow**. Female dairy cows grow up to produce the milk we drink.

On average, a dairy cow produces around 32 litres – or around 128 glasses – of milk every day.



DID YOU KNOW?

A cow's spots are unique. Just like our fingerprints, no two are alike and the patterns can be used to identify the animals.

Cows are creatures of habit and like routine. When they know it's their time to be milked, they eagerly make their way to the milking area. On average, cows are milked 2 to 3 times a day.

Maintaining **udder health** during the milking process is extremely important to dairy farmers.

There are three main steps in milking a cow, regardless of the method or technology used:

1. First, each teat is dipped with an antibacterial solution, called **pre-dip**, then cleaned and dried off. This process cleans the udder and stimulates milk production.
2. Then, the milking system is attached to all four teats and the cow is milked. A cow takes about five minutes to milk completely. The milking system will drop off the teat automatically after milking is finished.
3. After milking, the cow's teats are dipped again with a solution called **post-dip** that protect her teats from bacteria.

Dairy cows are mammals, and mammals only start producing milk after giving birth. A cow is pregnant for nine months. Once a cow calves, her milk production steadily increases for 2 to 3 months.

A cow is generally milked for approximately 10 months followed by a two-month **dry period** when she is not milked.

During the dry period, the cow eats, drinks, and stores energy to take care of the calf in her womb and give birth. A cow is re-bred two months after giving birth.

Most farmers prefer to use **artificial insemination** to breed cows, though some farms keep a bull to breed cows.

PROCESSING

From the farm, the milk goes to a dairy processing plant. Tanker trucks carry milk to plants from all over the province. The dairy plant has a clean, temperature-controlled environment. At the plant, milk undergoes four processes: **pasteurization**, **separation**, **homogenization**, and **packaging**.

Pasteurization

All milk must be **pasteurized** before any human consumption. The pasteurization process involves heating the **raw milk** to a very high temperature to kill any bacteria present which may cause diseases such as salmonellosis. The milk is then very quickly cooled. The pasteurization process does not change the flavour or colour of the milk.

Separation

Separation is the removal of the milk fat. This takes place in a large machine called a **separator**. The milk fat that is removed is called the **cream**. The remaining milk is called **skim milk**.

Standardization is the process of producing milk products that have the same milk fat content. Raw milk from the farm has approximately 3.6 per cent milk fat.

- Following separation, the remaining skim milk has 0.3 per cent milk fat remaining.
- To make 1 per cent milk, milk fat or cream is added back to the skim milk.
- All 2 per cent milk has 2 per cent milk fat.
- Whole milk has 3.25 per cent milk fat.

Homogenization

All milk (except skim milk and whipping cream) is mixed using a machine called a **homogenizer**. Homogenization breaks the milk fat into small globules. This stops the milk fat from rising to the top of the milk.





- **Vitamin A** – Vitamin A is naturally found in raw milk. When cream is separated from milk to produce skim and partially skimmed milk (1% and 2%), some of the Vitamin A is removed with the fat. Vitamin A is added back to skim, 1%, and 2% milk, as required by Health Canada.
- **Vitamin D** – Milk is fortified with Vitamin D, which is not naturally found in milk. Health Canada requires Vitamin D to be added to all forms of milk.

Chocolate milk (and other flavoured milks) are simply white milk with cocoa, sugar, and/or other flavourings added.

Packaging

Milk and milk products are packaged in a variety of paper and plastic containers. Cartons protect milk from dirt and light. They must be easy to handle and fit into home refrigerators. Dairy processing plants decide what type of containers to use. They make this decision by talking to consumers, grocery stores, and transportation companies. All paper and plastic milk containers can be recycled.

DIET

Cows have 32 teeth. On the top front of their mouths, cows have a tough pad of skin instead of teeth. They have eight incisors on the bottom front, and six strong molars on the top and bottom of each side to grind their food.

A cow is a **ruminant**. A ruminant has a four-chamber stomach, which helps them digest the kind of food they eat. When cows are ruminating, it is a sign they are content and comfortable – and making milk. Their food makes the following journey through their stomach:

1. The food goes into the first chamber, which is called the **rumen**, and forms into lumps of partially digested food called **cud**. Cud consists of large, non-digestible pieces of plant matter that must be regurgitated, chewed a second

time, and swallowed before continuing through the process.

2. The second chamber is called the **reticulum**. It is attached to the rumen with only a thin tissue divider and holds heavy or dense objects that are not meant to be digested. The reticulum traps these objects and large feed particles that are too big to be digested.
3. The third chamber is called the **omasum**. It is lined with large leaves and folds of tissue that resemble the pages of a book. The omasum absorbs water and nutrients from feed that passes through after the second round of chewing.
4. The last component of the stomach is the **abomasum**, often called the “true stomach” because it operates more like a non-ruminant stomach and is where digestion occurs.

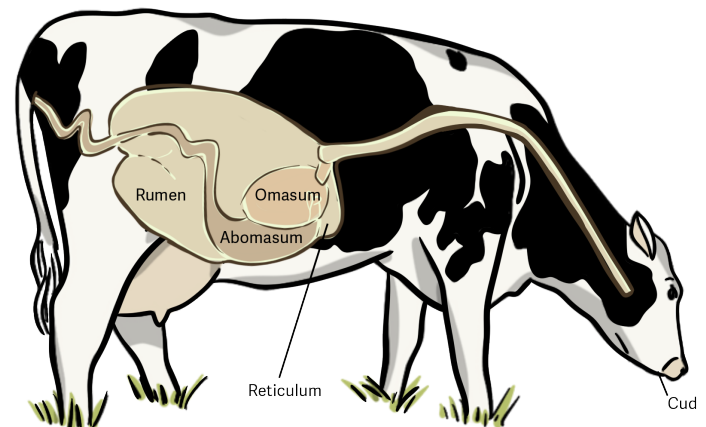
Cows are fed a healthy, nutritious diet of hay, grains, silage, vitamins, and minerals. Many farmers hire a **feed specialist** or **nutritionist** to make sure their cows have a balanced diet.

A typical daily meal for a cow:

- 2 kg alfalfa hay
- 12 kg alfalfa silage
- 20 kg corn silage
- 10 kg dairy ration
- 57 g minerals and salt (usually in the dairy ration)
- 80-180 L water

Cows have unlimited access to fresh, clean drinking water. A cow drinks four litres of water for each litre of milk she produces.

Calves are fed at least two times a day on a dairy farm: early in the morning and in the late afternoon. They get 3 to 4 litres of milk at each feeding. This amount increases as they grow.



They are fed milk or a milk replacer until approximately two months of age. At about two weeks old, they are offered a **calf starter** grain mix of rolled corn and pellets, plus necessary vitamins and minerals. At two months, they are weaned off the milk or milk replacer and fed water, dry hay, and a mixture of grains.

Many farms feed their cows a **Total Mixed Ration** (TMR). The farmer follows a ration sheet that details how much grain, silage, and hay they put into a large mixer wagon. The ration is changed according to the cows' needs. For example, cows at peak milk production are fed a higher nutrient mixture because they need more energy to produce milk.

NUTRITION

No matter what kind of milk you drink – from skim to homogenized to chocolate – you always receive the same 15 essential nutrients in every glass. Milk is fortified with Vitamin D and contains 87 per cent water. Its fat and sugar content varies with the type of milk.

1 cup of milk contains:

- as much calcium as 8 cups of spinach
- as much protein as a Grade A large egg
- more thiamine, riboflavin, and niacin than one slice of 100% whole wheat bread
- almost half our daily Vitamin D requirement
- a total of 25 measurable nutrients

TECHNOLOGY

Technology plays a critical role on a dairy farm. Computers help dairy farmers manage the farm.

Responders

On some farms, a cow wears an ankle bracelet or collar called a responder, which is like a cow smartwatch. The responder collects information like:

- Her name or number
- If she has been milked
- The amount of milk she gives (less milk than usual could mean she is sick)
- How many steps she takes (cows ready to be bred move around more than normal)
- When and how many calves she has had
- The history of her health



- How well she is digesting her feed (through a microphone in the collar)

This information is useful to dairy farmers: if anything seems unusual, the dairy farmer can identify which cow needs some extra attention to help her feel better.

Ear tags

When you visit a dairy farm, you'll also notice each cow has ear tags. Cows receive ear tags in each ear soon after they are born – and the tags stay with them their entire life. Ear tags don't hurt the cows.

The tags have a number unique to each cow. The ear tag is one way of telling the farmer who each cow is. The tags also keep track of each cow in Canada. If the farmer sells the cow, the tags make it easy to trace the animal's history.

Automated milking systems

Many farms in Manitoba have automated milking systems, which allow cows to choose when and how often they get milked. The system does the milking, which adds consistency to a cow's daily routine, and gives farmers time to spend with cows that need any extra attention.

Automated milking systems are relatively modern pieces of technology that take care of most of the milking process:

1. Cows learn that when they are ready to be milked, they need to walk into the automated milking system area.
2. The automated milking system can tell when a cow was last milked by reading information from her collar. It can also tell the number of visits she's made to the system in a day.
3. If the system agrees the cow is ready to be milked again, feed is dispensed for the cow to eat during milking and the system gets to work.
4. The automated milking system cleans all four teats,

attaches the cups, performs the actual milking, and cleans and sanitizes the cow and the equipment after.

This innovative technology helps farmers keep precise records of when each cow has been milked, how much milk they produced, and more. Farmers can even access this information from their phones, making it easier focus on other work on or off the farm.

ENVIRONMENT

Dairy farmers live and work on their farms every day. It's important for them to protect the land, water, and air for their families, surrounding communities, and future generations.

Federal and provincial laws regulate environmental practices on all dairy farms, regardless of size. Dairy farmers exceed regulations by:

- implementing environmental farm plans to improve manure usage, equipment, and storage
- maximizing the use of manure as fertilizer
- adopting modern technologies that allow them to maintain the temperature and ventilation of their barns while reducing their dependency on energy

Canada has one of the lowest carbon footprints for dairy in the world. From 1990 to 2019, the carbon footprint for a litre of Canadian milk decreased by 22 per cent. Canadian dairy farmers are targeting net-zero greenhouse gas emissions by 2050.

DAIRY PRODUCTS & BY-PRODUCTS

Dairy products include:

- Skim, 1%, 2%, and 3.25% milk
- Flavoured milk products, like chocolate
- Cream
- Buttermilk
- Butter
- Cheese
- Cream cheese
- Cottage cheese
- Sour cream
- Yogurt
- Ice cream

Milk ingredients can also be used during the process of making animal feed and nutraceuticals.



INDUSTRY IN MANITOBA

Number of Dairy Farms: 242 (2022)
Number of Milking Cows: 4,700 (2022)
Value to Economy: Over \$325 million in cash receipts (2021)



INDUSTRY IN CANADA

Number of Dairy Farms: 9,952 (2021)
Number of Milking Cows: 977,800 head (2021)
Value to Economy: \$7.386 billion in cash receipts (2021)



FARMER PROFILE



STEFAN SIGNER Kleefeld, Manitoba

“I enjoy dairy farming for the challenges but also the rewards that come from working with nature to produce food. By taking care of the soil, crops, and animals on my farm, I’m able to produce delicious milk that is also packed with loads of nutrients – nutrients my human nutritionist friends tell me are often lacking in our modern diets. I feel incredibly honoured when I see my friends or family enjoying a glass of milk, a scoop of ice cream, or a fine piece of cheese. There’s a sense of achievement knowing that some of the milk to make the food they’re enjoying came from my farm.”

CAREERS

- » Veterinarian
- » Electrician
- » Dairy herd manager
- » Feed specialist
- » Construction worker
- » Computer technician
- » Mechanic



Explore the diverse careers in agriculture at [thinkAg](https://www.thinkag.ca).