

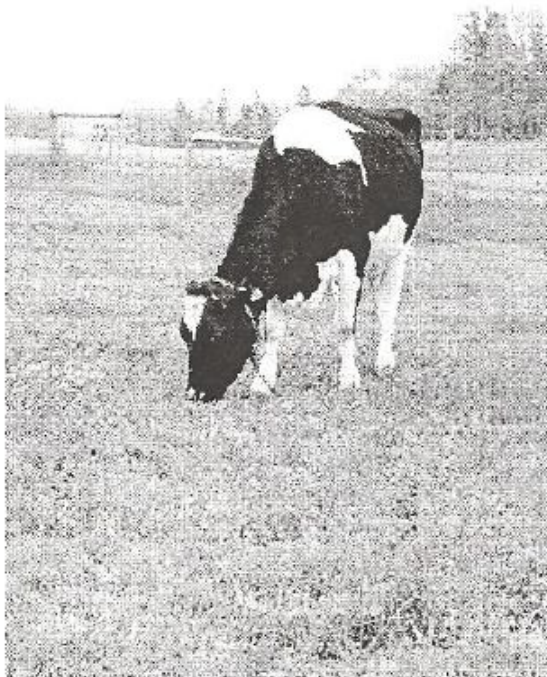
Dairy



What is a dairy cow?

A dairy cow is a mature bovine female, kept for milk production. A heifer is a female less than three years old which has not had a calf. A male is called a bull. A neutered male is called a steer. A young animal is called a calf.

The dairy cow performs the important job of changing grass and grain, which it eats, into milk. The dairy cow is a ruminant, as are beef cattle, sheep, goats and deer. A ruminant has four stomachs. The food enters the first two stomachs (rumen and reticulum), where it forms a lump called a cud. The ruminant brings up this cud and chews on it. When the cud is swallowed again, it goes to the third stomach (omasum) where the moisture is squeezed out and then on to the fourth stomach (abomasum) for digestion.



Interesting facts:

- 95 % of the dairy cows in Nova Scotia are Holsteins. Other breeds include the Jersey, Ayrshire, Guernsey and Brown Swiss.
- A dairy cow is usually bred by artificial insemination and some farms are using embryo transfer. These are efficient methods of improving breeding stock in a relatively short period of time.
- A cow will be old enough to breed when she is 14 to 19 months of age. The best calves are kept to be dairy herd replacements for other cows that are old or whose milk production is decreasing.
- Milk is a supply managed commodity in Nova Scotia. This means that the supply of milk is limited to the demands of the market. Nova Scotia producers must have a milk quota before they can ship milk to a dairy in the province. This quota is called TPQ (Total Production Quota), and is the amount of milk needed to meet the consumers' needs for fresh milk and all dairy products. This TPQ is determined on a national basis for each province. This provincial quota is then allocated to individual producers on the basis of kilograms of fat produced per day. Producers who wish to produce more milk must purchase quota from other quota holders through a quota exchange system. A producer who exceeds his daily quota ships his milk at a lower price. The milk shipped by the producer is used for a wide variety of dairy products.

Where is milk produced in Nova Scotia?

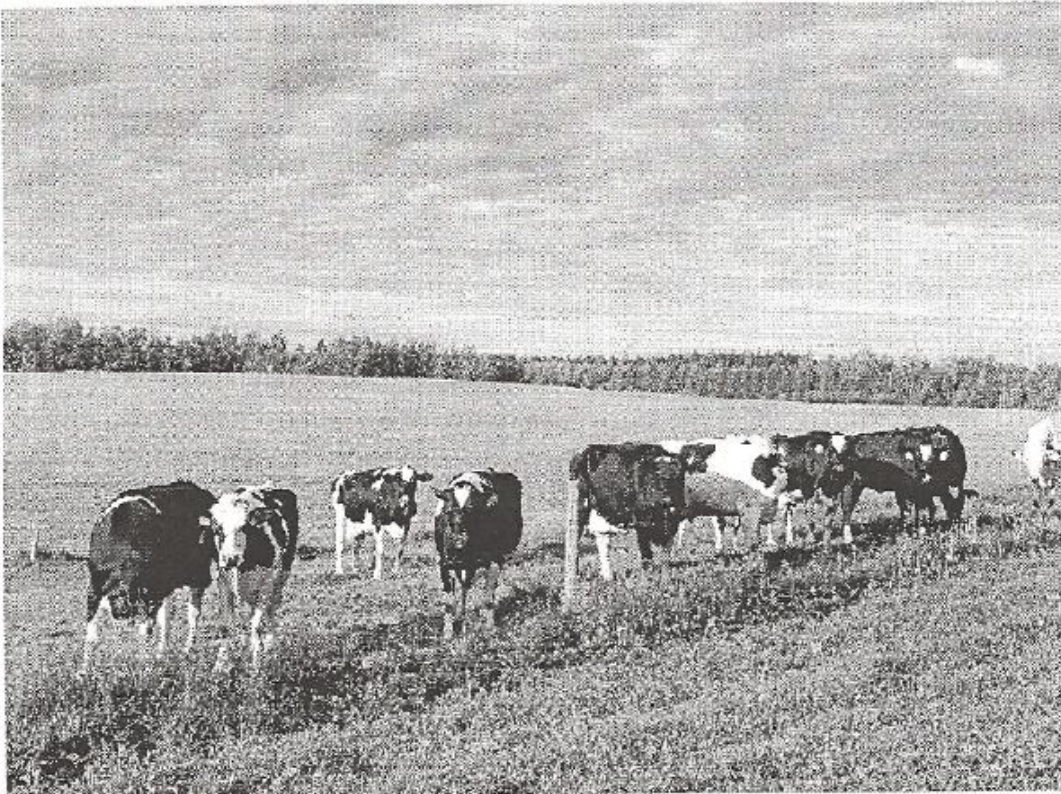
Dairy farms are found all over Nova Scotia, with the counties producing the most milk being Colchester and Hants. Antigonish and Kings counties also produce significant amounts of milk, followed by Annapolis, Halifax, Pictou, Cumberland, and Inverness counties.

How much milk do we produce?

Nova Scotia has over 300 dairy farmers, shipping over 170 million litres of milk in 2003-2004. The average dairy herd in Nova Scotia has 60 cows. The dairy industry in Nova Scotia has a farm gate value of over \$100 million annually and accounts for around 26% of Nova Scotia's total value of agricultural production.

How is milk produced?

A cow must calve first, in order for her to start producing milk. Calving usually happens in a well bedded pen, where the farmer can keep a good eye on the calving. After having a calf, a cow is said to have freshened and begins milk production or lactation. The calf usually nurses the cow for the first 24 hours, to get colostrum, or the cow's first milk. The calf is then usually separated from the mother, and the farmer looks after feeding it the right amount of milk with a bottle. This works best because the newborn dairy calf needs about 2 litres of milk in the morning, and 2 at night. The cow produces around 30 litres a day. This is too much for the calf to drink, and the calf will get sick if it drinks too much. The cow would also suffer from her udder not being milked out enough. A cow usually produces milk for about 10 months a year, has a 2 month rest, then calves and is milked again.



The dairy cow eats approximately 8 kilograms of grain and a minimum of 12 kilograms of hay per day. The cow drinks approximately 13 litres of water for every 5 litres of milk she gives. Cows are put on pasture in the summer and fed hay and silage in the winter. Silage is fermented material (either forage or grain) that is stored in air free conditions, such as under plastic or in a silo. Many dairy farms today are moving to computerized feeding systems. The computer is programmed to deliver a certain amount and type of food to each individual cow depending on such things as rate of milk production and the stage of her lactation.



Cows are usually milked twice a day - early in the morning and late in the afternoon. Dairy cows are kept in a number of different types of housing. Loose housing simply means that the cows are housed in a large communal area, and roam around at will, other than where they are being milked. Free stall housing is a variation of loose housing. Stalls are present, but cows are not tethered or tied and are free to seek whichever stall suits them. In a tie stall barn, cows are tied individually with

a chain or strap, and are usually milked in the stalls by mobile equipment. In the case of loose housing, cows move to the milking parlour at milking time. The milking machinery is permanently located here.

The milk is transported by a pipeline system to a milk house. The milk is placed in a refrigerated bulk tank which quickly cools the milk to just below 4^o Celsius. A milk truck comes to pick the milk up daily or every second day. The milk is taken to a dairy processing plant.

Regardless of how milking procedures vary, the emphasis on sanitation remains constant. The barns are cleaned daily and the cows are given fresh bedding to ensure cleanliness. The cows' udders are washed before milking. The milking equipment is made of stainless steel and glass with removable washable rubber parts which are kept very clean. The equipment is washed and sanitized after every milking, and the bulk tank is washed and sanitized after the milk has been picked up.

How is milk used?

The products made from milk are fluid milk drinks, chocolate milk, buttermilk and creams. Other important products are cheese, butter, yogurt, skim milk powder, ice cream and ice cream products.

What happens after milk leaves the farm?

Milk is picked up at the farm by a certified tanker truck, which delivers it to a milk processing plant. There, the fat is separated from the milk so that skim, .5%, 1%, 1.5%, 2% and homogenized milk can be made. Homogenized milk contains 3.25% butterfat. After separation, milk is pasteurized and

homogenized. Pasteurization is the process of quickly heating milk to 72°C and rapidly cooling it to 4°C. This kills any harmful bacteria and keeps milk fresher longer. Homogenization is the process of breaking the fat into tiny globules so that it doesn't separate out from the milk. During all these steps, quality control ensures milk is safe and clean. Milk is packaged quickly, usually within 24 hours of arriving at a dairy plant. An extensive provincial program evaluating shelf life of processed milk products has been in effect for many years. The majority of milk produced in Nova Scotia (63%) is sold as fluid milk. There are a number of quality checks that are done at the processing plant. Before the truckload of milk is unloaded at the dairy it is tested for antibiotics. This ensures that all products meet the strict standards of no antibiotics in milk. If antibiotics are found, the farmer who contaminated the load may be held responsible for the entire load. Milk is processed by four fluid milk processing companies in Nova Scotia: Cook's Dairy Farm Ltd., Saputo Milk Division, Farmers Co-operative Dairy and Scotsburn Dairy Group. The last two are cooperatives owned by dairy farmers and together handle the majority of the total fluid milk sold. Nova Scotia has three small specialty plants: Holmstead Cheese Sales in Harmony, Kings County, That Dutchman Cheese in Economy, Colchester County and Fox Hill Cheese House in Kings County. Farmers Co-operative Dairy operates a cheddar and mozzarella cheese plant in Truro.

What challenges do dairy producers face?

Nova Scotia dairy producers work hard to ensure consumers receive quality dairy products at reasonable prices. Only a small share of the consumer dollar goes to dairy producers. An 8 ounce glass of milk in a restaurant will typically cost \$1.95. Of that \$1.95, only 16 cents goes to the milk producer, who feeds the cows, milks the cows, transports the milk, etc. The costs of things such as land, fuel, labour, feed, equipment and fertilizer often go up faster than the returns for the milk. Farmers have to bear the cost of putting food safety, farm safety, animal welfare and environmental regulations into effect. Global markets mean food that is cheaper to produce elsewhere can be shipped in to Nova Scotia.

Who's involved in producing milk?

- Dairy farm owners, managers and staff (milkers, herdsman, field personnel)
- Breed associations
- Artificial insemination technicians
- Dairy herd improvement advisors
- Veterinarians
- Milking equipment, farm equipment, building and facility suppliers
- Feed producers and nutritionists
- Dairy workers
- Government inspectors, advisors
- Researchers
- Milk tank truck drivers
- Packaging designers and manufacturers
- Milk product deliverers
- Store employees

Contacts and other resources:

Dairy Farmers of Nova Scotia