

Dairy Production in British Columbia

Dairy production – The top agricultural industry in B.C.

There are over 1.2 million dairy cows living in Canada, and each dairy cow produces an average of 30 litres of milk per day. The most common dairy breed is the Holstein (white with black markings), which makes up almost 94% of the Canadian dairy herd.



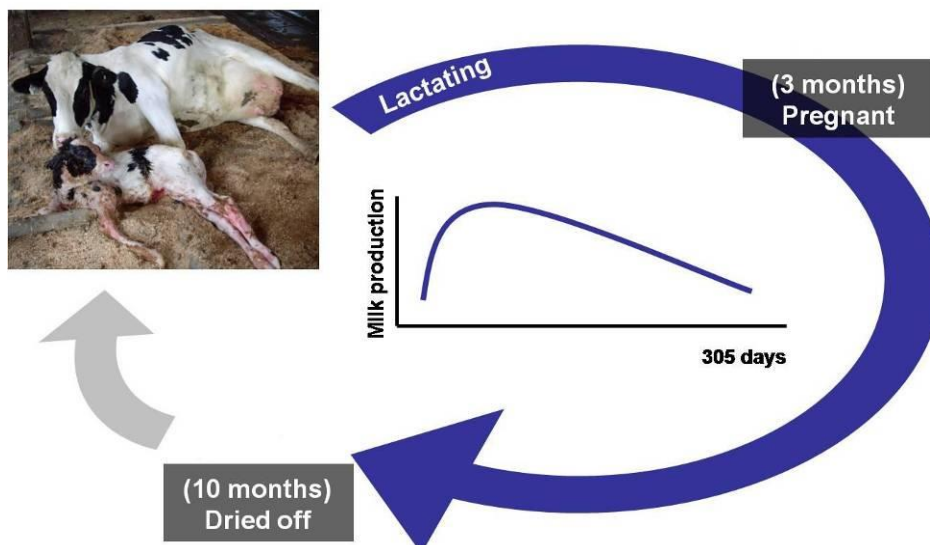
Life of a Dairy Cow

The average life-span of a dairy cow on a commercial farm is about 5-6 years (~ 2.5 lactations). Dairy cows are constantly being replaced by new heifers (young female cattle about to have their first calf) as they come into their first lactation, so their life-span on a farm is much shorter than the natural life expectancy. Replaced cows, as well as sick or injured animals, are culled (removed from the farm) and often sold for meat, either for human consumption, or for other animals (e.g. pet food).

Milk Production

Dairy cows produce milk (lactate) for 305 days every year. They are rebred (impregnated) approximately 60-90 days after calving in order to start a new lactation in the year after, following a pregnancy of 280 days (a similar gestation period to humans). Most farms practice artificial insemination, instead of using a bull, to breed their cows. This allows them to take advantage of a wider variety of genetics and also reduces the risk of worker safety from aggressive bulls. Some farms use a “clean-up bull” to breed the cows who do not conceive from artificial insemination.

Cows on a dairy farm are managed to be at different stages of the lactation cycle in order to provide a constant supply of milk all year around. Cows are typically milked 2 or 3 times a day in automated milking parlours.



Annual lactation cycle of a dairy cow (courtesy of Katy Proudfoot)

How are cows milked?

- 1) Herdsman brings the cows into a holding area adjacent to the milking parlour, and small groups of cows walk into the parlour at a time.
- 2) Each teat of the cows is cleaned with an antibacterial solution before the milking machines are attached.
- 3) Milking takes about 5-10 minutes and the machine comes off automatically when it is done.
- 4) Teats are dipped with iodine solution. At the end of milking, the teat sphincter is still relaxed and is especially susceptible to bacterial infection.
- 5) Cows are released from the parlour and walked back to their pen.



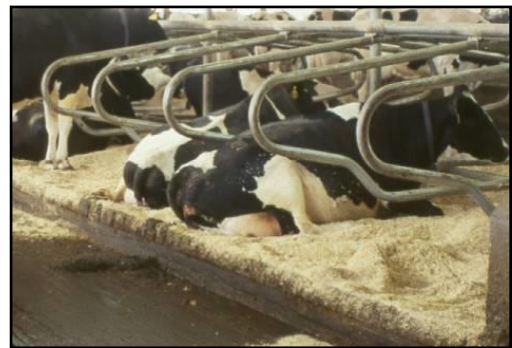
Modern milking parlour: (Left) This parlour can milk 20 cows at a time. (Right) Milking in action: cows have the milking machine attached to their teats.

Housing of Dairy Cows

Most dairy cows in BC are housed in free-stall barns, which are very different from tie-stall barns used on a majority of farms in Ontario and Quebec.

- **Free-stall barn (pictured to right, above):**

Cows are housed in indoor pens with free access to bed stalls, usually bedded with sand, sawdust, mattress or a rubber mat. They also have continuous access to the feed bunk and water troughs and are walked to the milking parlour at every milking. In a free-stall barn, cows spend nearly 6 hours feeding and 10-14 hours lying down in the stall.



- **Tie-stall barn (pictured to right, below):**

Cows are tethered by their neck to individual stalls where they spend all their time, including milking. This system restricts free movement of the cow and limits her ability to engage in other behaviours such as grooming and social contact with other cows. One welfare benefit, though, is that lameness (a major welfare concern in dairy cows) is less common in tie-stalls, as the cow spends no time standing on concrete.



Dairy barns have concrete floors, and manure is removed by flooding the alley with water or scraped using a tractor or mechanical scrapers which run along the alley floor. Because concrete floors can be hard on cows' feet (causing lameness), many newer barns are installing rubber mats along parts of the alley.

Feeding Management

Cows are typically fed a mixture of hay, corn silage or grass silage and grain. Most of the forage is grown on-farm in BC using manure from the herd to fertilize the fields.

- **Hay:** Dried or cured grass stored as bails; grown on farm or purchased.
- **Silage:** Fermented high-moisture forage such as corn and grass; usually made on farm.
- **Total Mixed Ration (TMR):** A complete mixture of hay, silage and grain formulated to meet the high nutritional demand of dairy cows. Feeding of TMR is particularly common on large farms.

Fresh feed is usually provided once or twice per day, but cows should always have access to plenty of feed and water.

Access to Pasture

Cows can be pastured for 24-hours a day but a mixed system where cows go out on pasture for only a part of the day is more common in BC. Particularly in the Fraser Valley, even partial-pasturing has become rare for a number of reasons:

- 1) Herd sizes have increased substantially while the amount of land around the farm remains the same, leaving farmers without enough land for grazing.
- 2) Dairy cows have especially high nutritional demands to produce milk, and it is difficult to provide enough energy and nutrients on a pasture-based diet. This is in part due to great variability on pasture quality throughout the seasons.
- 3) Traditionally, grain was fed in the milking parlour to supplement a pasture-based diet, but modern milking parlours have become larger to accommodate a larger herd size and therefore tend not to have the capacity to feed while milking.
- 4) Wet weather in the Fraser Valley only allows for 6 months) of grazing at most (typically, the end of April until October). Moreover, the rain in early summer leaves pasture muddy, putting cows at risk of mastitis (bacterial infection of the udder) and hoof diseases. Hot summers can also produce problems as cows have a low tolerance for heat. They can become heat stressed if the temperature is higher than 25°C, especially with high humidity.



Heifers and cows who are not producing milk or who are at the end of the lactation have lower nutritional demands, so they are more likely to be pastured than the cows who are at the peak of their lactation.

Health Management

It is typical on BC dairy farms that a veterinarian visits the farm for a routine herd-health-check every 2-4 weeks in order to check pregnancy status of certain cows. While on-site for these visits, the veterinarian may treat other cattle who are sick or injured. The veterinarian is always on-call for emergencies regarding cows or calves on the farm.

Hoof trimming is an important practice for prevention and/or treatment of lameness. On most farms, every cow is hoof-trimmed at least once per year. Their hooves are scraped and checked for any abnormalities or lesions (sores) at this time. Additional hoof trimming may be necessary if lameness is suspected.

Lameness

The most common injuries to dairy cows are bruising or ulcers on the soles of their hooves (pictured to right) and sores on their legs caused by rubbing against concrete bed stalls. These injuries cause animals to become “lame,” which means they have difficulty walking. Pasture or other soft, dry surfaces can help reduce the risk of these injuries.



Lameness is one of the most serious welfare concerns for dairy cows because it is painful, and unfortunately it is also very common. Research demonstrates that about 25% of dairy cows at peak lactation in BC are clinically lame – on some farms this number can escalate to over 50%. Animal welfare scientists are working hard to find ways to detect lame cows early so that they can be treated. They are also working with farmers, veterinarians and other professionals to find new ways to design and manage dairy barns to prevent cows from becoming lame in the first place.

Transition Period Diseases

Dairy cows give birth every year in order to continue producing milk. The transition from pregnancy through giving birth to producing milk is full of changes and challenges, and has been aptly named “the transition period”. Not surprisingly, some dairy cows cannot cope with all of these challenges and illness is common during the transition period. This vulnerability to disease is largely due to the incredible energy demand that lactation places on their bodies. As much as 30-50% of cows become sick with metabolic or infectious disease during this period. For this reason, it is critical to ensure that cows have good access to high-quality feed at this time. Canada’s Code of Practice for the Care and Handling of Dairy Cattle recommends that 2 feet of space be provided per cow at the feeder, and ideally an entire group of cows should be able to eat at the same time.

Raising Calves

Most dairy producers raise their own calves and heifers to replace the older cows in the herd.

Calves are born without a fully functioning immune system, and they depend on colostrum (the first milk a cow produces after calving) to provide a boost of immune proteins to protect them until their own immune system develops. If a calf does not drink at least 4 litres of high quality colostrum within 12 hours after birth, she is left susceptible to disease; a significant welfare concern.



A newborn calf is typically separated from the mother within 24 hours of being born. Research has shown benefits to both the cow and the calf if they are allowed to stay together, but the stress from separation will increase the longer they are allowed to stay together.

Calves are fed milk (whole milk from the herd or powdered milk-replacer) in a bucket (above, right), through a plastic teat or from a bottle (below, right). Traditionally calves have been provided about 4 liters of milk per day divided into two feedings, but calves need more than this amount and many farmers are beginning to increase this amount. To contrast, calves would nurse from the cow 5 - 10 times per day and drink about 10 litres of milk if left with the cow.



Calves are typically weaned from milk at 6-12 weeks of age. Nutritional weaning may be performed abruptly (removed entirely in one day) or gradually (reduced slowly over a number of days), although gradual weaning is considered to be more humane. At weaning, calves must make a dietary transition from milk to solid foods such as grain and hay. Once a calf is weaned from milk, she is generally referred to as a heifer, rather than a calf.

Calves may be housed individually (in indoor pens or outdoor hutches) or in small groups. Individual housing is currently more common because it provides the farmer with more control over feeding and is thought to reduce the risk of disease spreading between calves. However, housing calves in well-managed small groups provides opportunities for exercise, social contact and more space, without compromising their health. Recently, computer-controlled feeders are becoming more popular as they can feed controlled amounts of milk to individual calves in a group-housed setting.

Heifers (weaned female calves) are normally bred at approximately 15 months of age, and then join the milking herd once they have their first calf at 2 years of age.

Dehorning or Disbudding Calves

Female dairy calves are dehorned in order to prevent injury to each other or to people later in life. Using a procedure called "disbudding," the small emerging horn bud is prevented from growing by burning the tissue with a hot iron or a caustic chemical paste (pictured to right). This is generally done between 3-7 days of age, depending on the method. Both methods cause damage to the tissue, thereby preventing horn growth.



Research has shown that pain caused by these procedures can be eliminated by giving calves a combination of a sedative, local anesthetic, and analgesic. In Canada, it is now required that at least some kind of pain control is used when dehorning or disbudding according to the Code of Practice for the Care and Handling of Dairy Cattle.

Male (Bull) Calves

Bull calves are not kept on a dairy farm, but are sent to an auction at around one week of age. Veal production (sometimes called "young dairy beef") using unwanted male calves is rare in B.C. Raising of veal calves in confinement crates used to be more common in B.C., but now most bull calves are bought at auction by farmers who intend to raise them as beef cattle.