TIPS•FOR•TOURS

Dairy Farm Tour Tips For

TEACHERS

BC Agriculture in the Classroom Foundation
bcaitc.ca

BC DAIRY ASSOCIATION

This document has been compiled by the
British Columbia Agriculture in the Classroom Foundation

1767 Angus Campbell Road Abbotsford, BC V3G 2M3
www.bcaitc.ca

in cooperation with:

BC Dairy Association

British Columbia Investment Agriculture
and
British Columbia Ministry of Agriculture

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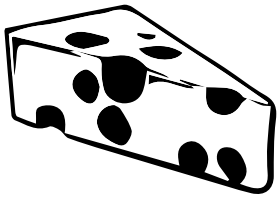
Why Choose a Dairy Farm for a Field Trip?

Dairy Farm Tour Topics



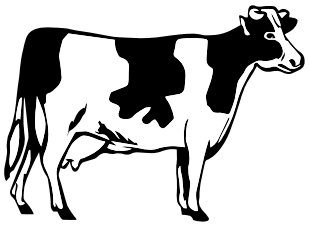
A farm tour provides the opportunity to raise awareness of the role of agriculture and food production in our daily lives.

Agriculture is a business that affects all of us within our communities. During the course of a tour students can begin to understand the multifaceted role of a farmer: in the stewardship of the land and the farm, in the care and wellbeing of the livestock, in the safe use of machinery and technology, and in the interactive role with the community. Some of the topics that can be introduced are the:

- history of farming, the farm family, how farming has changed, plights and joys of farming, the farm lifestyle;
- importance of agriculture in providing diverse career opportunities
- top quality products BC agriculture has to offer, the types of foods produced and the process by which they reach the consumer
- costs of farming-how a tractor compares to a car
- relationship of farm animals and crops to the food and food products we use daily (including by-products)
- chemicals used in agriculture both natural and synthetic; their use and handling; chemical costs and alternatives
- safety standards for workers and for food handling and preparation
- weather and seasons - impacts on farm and production
- problem solving and innovations
- animals on the farm-their similarities and differences; the variety of crops and types of animals, care of animals, products derived from the farm
- the role technology has in improving the safety and quality of agriculture and the products it produces.

Farming is our "bread and butter". Seeing, breathing and experiencing farming helps all of us see how we are connected in the most basic of all things-food.

Choosing a Dairy Farm



Not all farms are created equal. Some farms may have more emphasis on one subject area than another. Time of year or season will also effect what you see and the availability of staff to assist you in answering your questions. Dairy farms for example are busiest during the spring, summer and early fall months as field work adds to their already busy schedule.

To determine which type of farm and the best time of year to visit review the following:

FARM TYPE	WHAT YOU MAY SEE	FARM AVAILABILITY
DAIRY FARM	Wide range of activities both plant and animal. Use of technology e.g. computers, machinery and a systems approach (milking equipment).	Best time is in Winter.
FRUIT AND VEGETABLE GROWERS	Product on the vine, tree, root. Machinery in use. Some may have a processing plant on -farm.	In Fall during harvest is best but availability may be limited.
SHEEP FARM	Life cycle, animal care, feeding will be highlights. Machinery or technology may not be highly visible although computers will be used for accounting/records.	Spring - (March/April) after lambing.
GOAT FARM (DAIRY)	Similar to a dairy cow operation but with goats. Some may have a processing plant in close proximity to goat operation.	Winter is best.
GREENHOUSE FLOWERS	Check with grower.	
GREENHOUSE VEGETABLES	Check with grower.	Fall or early Spring during or after harvest.

TIP: For a list of farm tour locations please visit BC Agriculture in the Classroom at www.bcaitc.ca

New BC Curriculum Connections

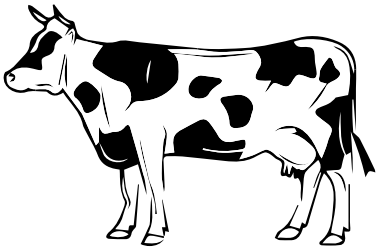
GRADE	SUBJECT	CONTENT CONNECTION
KINDER	Science	- Basic needs of animals - Living things make changes to accommodate daily and seasonal changes
	Social Studies	- Relationship between the community and environment
GRADE 1	Science	- Names of local animals - Behavioural adaptations of animals in the local environment
	Social Studies	- Relationship between the community and environment
GRADE 2	Science	- Similarities and differences between offspring and parent - Water sources including local watersheds - Water conservation and the water cycle
	Social Studies	- Diverse features of the environment - Relationship between the community and environment - Aspects of life shared across cultures (family, holidays, food, etc.)
GRADE 3	Science	- Biodiversity in the local environment
	Careers	- Connections to the community
GRADE 4	Science	- Sensing and responding to humans, environment, and animals
GRADE 5	Science	- Basic structures and functions of body systems - Interconnectedness with the environment
GRADE 6	Science	- Basic structures and functions of body systems
	Physical and Health Education (PHE)	- Practices to promote health and well-being; influences on food choices
	Social Studies	- Urbanization and migration of people - Economic policies and resource management - Globalization and trade
GRADE 7	Science	- Organisms have evolved over time - Survival needs
	Social Studies	- Human responses to particular geographic challenges and opportunities
	Careers	- Local and global needs and opportunities - Life and career planning

New BC Curriculum Connections

GRADE	SUBJECT	CONTENT CONNECTION
GRADE 8	Science	- Characteristics of life - Relationship of microorganisms with living things
	Social Studies	- Human responses to particular geographic challenges and opportunities, including climate, landforms and natural resources
	Applied Design, Skills and Technologies (ADST)	- Food Studies → social factors that influence food choices; variety of eating practices; local food systems - Entrepreneurship/Marketing → role of entrepreneurship in designing and making products/services (branding, pricing, record keeping); difference between consumer wants and needs
GRADE 9	Science	- Sexual reproduction - Matter cycles within biotic and abiotic components of ecosystems
	Applied Design, Skills and Technologies (ADST)	- Food Studies → ethical issues related to food systems - Entrepreneurship/Marketing → flow of goods and services from producer to consumer; identification of a good/service
	Careers	- Factors affecting types of jobs in the community
GRADE 10	Sciences	- DNA structure and function - Patterns of inheritance - Applied genetics and ethical considerations
	Applied Design, Skills and Technologies (ADST)	- Food Studies → simple and complex global food systems; causes and consequences of food contamination outbreaks - Culinary Arts → locally available food products
GRADE 11	Sciences	- Human actions and their impact on ecosystem integrity - Resource stewardship - Water distribution has a major influence on weather and climate - Levels of biotic diversity
	Social Studies	- Global agriculture practices - Demographic patterns of growth, decline and movement
	Applied Design, Skills and Technologies (ADST)	- Food Studies → issues involved with food security; factors involved in the creation of food guides/labelling - Culinary Arts → BC agriculture practices
GRADE 12	Sciences	- Organ systems structure and function/interdependence - DNA/ gene expression - Land use, degradation and management - Conservation of water
	Social Studies	- Global agricultural practices

Planning and Arranging a Tour

Link the Farm Tour with the Classroom Studies



- Use videos and Agriculture in the Classroom materials to give students some insights as to what they may see during the visit.
- Find out if anyone has a family member who farms. Get them to share their experiences.
- Review *Grow BC* resource to become familiar with the different types of farm productions.
- Have the students prepare some questions ahead of time.
- Learn how to milk a cow: it takes about 10 minutes for an experienced milker to milk a cow that takes a machine half the time. To experience this first hand you will need: rubber gloves, pins and water. Poke a small hole in the bottom of each finger. Fill glove with water and hold open end firmly with one hand. To "milk" pull down and gently squeeze on one of the fingers.
- Worksheet for bus ride-spotting items on the way that relate to agriculture. Compare the terms "farming" and "ranching". Discover differences and similarities.

Prior to the Tour

- ❑ Book the bus or arrange carpooling.
- ❑ Permission slips sent, returned and signed by parent or guardians prior to the event.
- ❑ Visit the farm and go over the tour plan if possible.
- ❑ Arrange for volunteer supervisors.
- ❑ Complete *Information Sharing Form* in this package.
- ❑ Bring all required equipment-camera, video, note pads, pencils, first aid kit.

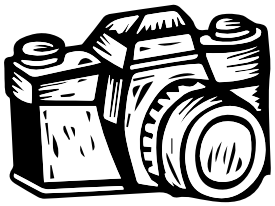
Last Minute Reminders

- Wear easy to clean warm clothes and wear waterproof footwear for wet weather.
- Use washroom facilities before you leave the school.
- Bring water and a snack or lunch if needed.

Planning and Arranging a Tour

During the Visit

- Class supervision is necessary during the entire visit. **Ensure that parents agree to stay focused on the tour at all times. The farm tour is educational and not a time to socialize.**
- Follow the farmer's rules for your safety around animals, machinery, equipment and structures. Remember the farm is a working farm and like any manufacturing workplace, dangers are possible.
- Avoid loud noises and sudden movements. These will frighten the livestock and potentially create dangers for you and reduce production for the farmer.
- Always be on the lookout for potential hazards. What may seem obvious to the farmer as a danger, may not be to you and your group.
- Students or teacher/supervisor may want to collect memories.



1. Take pictures for school displays. Remember some pictures, drawings or stories written by the children may be appreciated by the farmer too.
2. Record audio/video: must have permission to film farm premises.
3. Samples of feed, hay (with permission from farmer). Bring plastic grocery bags.

Planning and Arranging a Tour

What to do After the Visit

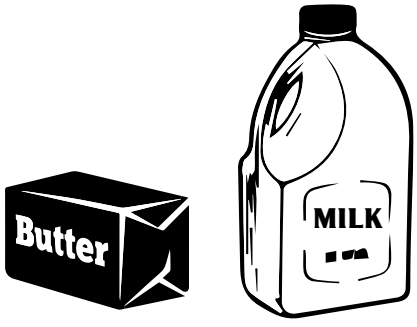
- Use the notes, pictures, samples collected and make illustrated big books.
- Library display of farming and related books.
- Career day: listing and outlining all the various careers in a dairy operation - invite professionals to the class.
- Theme week or skit to share with a wider audience within the school.
- In-depth research of some of the issues revealed during the farm visit.
- Art display of farm sights and activities.
- Poster contest of what farming is all about or where food comes from.
- Arrange for an "adoption"- follow the growth of a dairy calf from birth to her first calf.
- Use Agriculture in the Classroom lesson plans where available.
- Take a product, e.g. a hamburger, and determine all the job related activities.
- Create a board game with issues and dangers concerning the farmer's operation.
- Create a model of the farm.
- Consider entering agriculture models and issues in Science Fairs.
- Chronicle a week in the life of a farmer.
- Consider incorporating *Butter Churns and Stern Wheelers* - grades 4/5 available at www.bcaitc.ca.
- Compile a catalogue of (milk) products or create a sales flyer advertising things a farmer might need.
- Collect recipes for a (milk) cookbook. Try one of the recipes with the class.
- Compose a song about the farm or product produced on the farm visiting, e.g. update and rewrite, "Old MacDonald's Farm".

Planning and Arranging a Tour

Make Butter

You will need a glass jar with a lid and cream. Pour about 1 cm of cream into a jar, close lid and shake the jar vigorously until the cream turns into butter. It will take about 5–10 minutes of very vigorous shaking. Add salt to taste.

- Research what lactose intolerance is.
- Collect ads about milk and other beverages (e.g. colas) - compare the nutrition and the language changes.
- Find out how many famous stories, riddles, sayings have farm terms in them, e.g. Jack and the Beanstalk; "Don't cry over spilt milk".
- Math relationships. Determine how many litres of milk one cow would produce. (See trivia section.) Get the children to keep a list at home of how much milk they use on cereal, in milk drinks, parents coffee, butter on toast, etc. Could they keep a cow at home?
- "Tasting" Centre: do a taste test
    1. Compare homogenized, 2%, buttermilk, skim, powdered milk, chocolate milk, organic milk.
    2. Have children taste each sample and record their comments.
    3. Graph results.
    4. Have a selection of many different product cartons/packaging - talk about all the people involved to get the raw product to this stage.



Information Sharing Form

Teacher to Farmer - for the teacher to fill out.

Before the Tour

- Pre-Visit the farm and go over tour plan if possible
- Provide list of participants
- Arrangement of specific activities or achievement of specific goals

Things the Farmer Needs to Know

Teachers name _____

School name _____

Contact number _____

Age level of the group _____

Number of children and supervisors (does not include one teacher per class) _____

Children Supervisors

Recommended ratios of children to adults:

Primary (K-Grade 3): 6 children to 1 adult
Intermediate (Grade 4-7): 10 children to 1 adult
Secondary (Grade 8-12): supervisors if any children with special needs or behaviour challenges

Topics the teacher would like introduced _____

If there are any special needs children (eg. wheel chair accessibility) or children with allergies (eg. hay allergies)

_____

What are the hours, days or months that the visit is preferred _____

Farmer to Teacher - for the farmer to fill out.

Things the teacher needs to know

Name of farm _____

Contact name _____

Contact number _____

Type of farm _____

What specific limitations are there (eg. they must be gone by 2 pm end of shift) _____

Appropriate clothing (eg. closed tow shoes, no flip flops, no heals, etc.) _____

Restriction on group sizes. If they will need to be divided into supervised smaller groups _____

Any monetary charges for visit or for snacks _____

Contract required: Yes ❑ No ❑

Location of the farm

- Provide a map with a clearly marked route. Indicate distance from the school.
- The type of parking facilities and distance to the assembly area. Is there capacity fro cars (carpooling) or buses.
- Where to assemble upon arrival

Evaluation Form

Please fill out this evaluation for the farm tour you participated in today. Thank you.

Send completed form to: _____

This program increased my students understanding and appreciation of agriculture and farming.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

This program helped my students understand where their food comes from and/or gain an understanding of how food is produced.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

This program is a valuable curricular-linked learning experience for my students.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

I will use the resources provided to me from the tour.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

I would recommend this tour to another school/teacher.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

I would consider taking part in another farm tour in the future.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

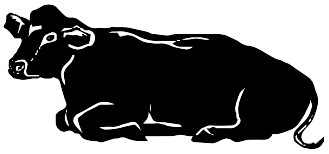
Please provide feedback on the tour, presenter, resources, or other elements you have identified that you would like to see AITC address for the future:

School Name: _____ Farm Name: _____

Teacher Name: _____ Farm Contact: _____

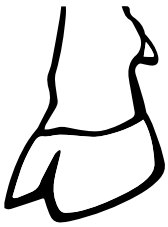
Number/Grade of students: _____ Type of tour _____
(dairy, ranch, greenhouse):

Related Dairy Facts



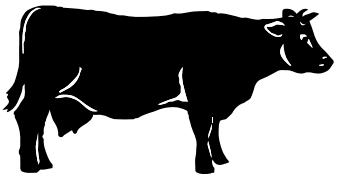
- All cows are female.
- Males are called bulls.
- The most common breed is the Holstein, (black and white cows) and it represents about 85% of Canadian dairy herds. Ayrshire, Jersey, Brown Swiss, Canadienne, Guernsey, and Milking Shorthorn make up the remaining 15%.
- A Holstein's spots are like a fingerprint or a snowflake. No two cows have exactly the same pattern of spots.
- A cow sees in black and white, not colour.
- Cows have difficulty judging distances.
- Cows have extremely sensitive hearing and can detect sounds that people can't hear.
- Cows require clean and dry environments in which to sleep, eat and bear their young.
- Cows require fresh, well balanced diets that include forage, grains, minerals, vitamins and water. Cows prefer to eat all day, with peak feeding times after activities like milking.
- Cows are mammals and like all mammals produce milk for their young.
- The cow must be a mother before she will produce milk.
- When a dairy cow reaches about 15 months of age she is bred, usually by artificial insemination. Pregnancy in a cow lasts about 9 months.
- Once she calves (gives birth) she continues to give milk for approximately 10 months and then has a 2 month holiday just before she calves again.
- A newborn Holstein calf weighs about 45kg and can walk within one hour after birth.
- A newborn calf weighs about 45kg and can walk within one hour after birth.
- The manure a cow produces contains nutrients. The farmer collects all the manure produced, store it and reuses it on the land as a fertilizer or soil conditioner when the plants need it most. The farmer may even bag it and sell it to the local garden store for your garden.
- If a cow gets sick she will be treated and may be given antibiotics.

Related Dairy Facts



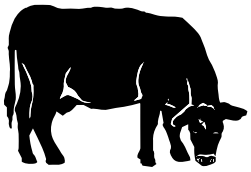
- Antibiotics are medicines that help the cow fight infections. The farmer works with a doctor (veterinarian) and under their advice will provide medicine to the cow. The farmer or vet will take great care in the amount and way they give medicine.
- Every medicine given to the cow has a mandated amount of time for which the milk must be discarded. This milk will not be shipped off the farm until the mandatory discard time is over.
- To be sure antibiotics do not enter milk, a sample is taken from every load of milk before it leaves the farm. That sample is tested and if antibiotics are found, the load is destroyed and the farmer heavily fined. If this is a continual problem the farmer may even lose their license to ship milk.
- Cows are built to graze and eat lots of grass. Their cloven hooves provide the traction to walk on pastures, and their large rumens (stomachs) allow them to consume large quantities of grass to digest later when no predators (concerns) are about.
- Milk cows have their ears pierced with I.D. tags. Each cow has a different number that allows the dairy farmer to track her activities by computer. The amount of milk a cow produces may be recorded in the computer as well as any medicines she receives.
- Dairy producer supplies to the community:
    1. milk,
    2. manure (fertilizer), and
    3. markets (machinery sales, seed/ fertilizer sales, veterinarians, processors, etc.).
- Approximately 75% of dairy farmers are located in the Fraser Valley because:
    1. easy access to all supplies (equipment, feed, chemicals, processors, expertise, etc.);
    2. good growing soil from the rich soils of the old Sumas Lake bed and Fraser River tributary;
    3. moderate climate and long growing season; and
    4. close proximity to amenities.

Related Dairy Facts



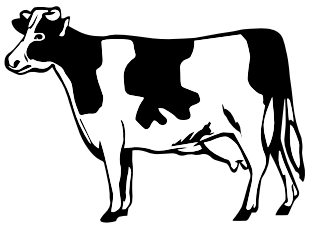
- Farmers grow grass, clover, grains (in the Peace River region), alfalfa (Interior region).
- A number of people are involved in getting the milk from the farm to the table:
    1. dairy farm owner, manager and staff (milkers, herdsmen, field personnel);
    2. producer, breed and industry associations;
    3. artificial insemination technicians;
    4. dairy herd improvement (record keeping) advisors;
    5. veterinarians;
    6. milking equipment, farm equipment, building and facility suppliers;
    7. feed producers and nutritionists;
    8. dairy processor field representatives;
    9. government inspectors and advisors;
    10. government and university researchers;
    11. milk tank truck drivers;
    12. milk product deliveries; and
    13. store owners and employees.
- A cow that is being milked can eat up to 40kg of grass, forage, and hay a day and drink up to 150L of water a day, especially on hot days. That's over a bathtub full.
- A cow's diet is supplemented with feeds such as barley, wheat, soybean and canola meal.
- A cow's diet is formulated and fed according to the energy, protein and other nutritional needs of the animal by an animal nutritionist.
- On the top front part of the jaw, cows have a tough pad of skin instead of teeth. They have 8 incisors on the bottom front and 6 strong molars on the top and bottom of each side to grind their food. Cows have a total of 32 teeth. Cows use their tongue against the pad to rip the grass.

Related Dairy Facts

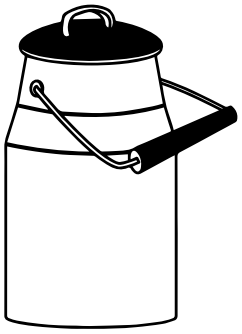


- Cows are ruminants and regurgitate their food and chew cud. A cow spends a lot of time eating - up to 8 hours per day.
- A cow has 4 parts to the stomach-rumen (the largest), reticulum, omasum and abomasum. It is the abomasum that is the most like ours.
- Dairy farms use large volumes of water. A milking parlour uses water to wash down the facility and the equipment after every milking. This water is often saved and reused to flush manure from the barn. The farmer will also use water for irrigation, for the cows to drink and in hot weather they may even use it to spray cows to keep them cool.
- The amount of water required by a dairy animal is affected by her body size, the amount she eats, how fast she grows and how much milk she produces, as well as by salt consumption and outside air temperature. The more she produces the more water she needs. e.g. A cow producing 40 kg milk/day will drink 100-150 litres/day, while a cow producing only 20 kg milk/ day will drink 65-100 litres/day.
- Cows have adapted well to their environment, but do not change that much from season to season. Some extra hair growth will occur, but the cow primarily depends on the farmer to help keep her warm in the winter-they provide warm, well ventilated barns and well bedded stalls. In the summer, the farmer provides her with shade, fans, and may even sprinkle the cows with water to keep them happy and cool.
- Farming is a way of life. Dairy farmers work 365 days of the year, from morning to night. They do not have to commute to work - just walk to the barn.
- The average cow produces 36 litres of milk a day and is milked for 10 months a year, which equals approximately 10,800 litres of milk per year per cow. That's an average of 118 glasses of milk per day, every day of the year. This amount would fill up 53 bathtubs.
- Milking machines are used to milk a cow. The cows go into a milking barn, their udders are cleaned and a rubber lined suction cup is attached to the teat. The suction cup simulates the suckling action of a calf nursing. The suction cup or claw is attached to hoses and pipes which collect the milk in a holding tank. The milk is then quickly cooled.
- Cows are milked twice and sometimes three times a day, usually at the same times each day. All equipment used for milking is thoroughly cleaned and sanitized before and after each use.

Related Dairy Facts



- It takes approximately 5 minutes to milk a cow by machine - by hand would take at least 10 minutes.
- Machine milking has been around since the early 1920s. Milking machines were not commonly used until sometime after WWII. As herds became larger, providing product beyond the family needs, the farmer needed to become more efficient, and provide a better quality product. Machine milking allowed for more cows, fewer labour costs and as the technology advanced, better milk quality as contamination via milkers' hands and open buckets were greatly reduced.
- Dairy farms are inspected and certified before they can produce milk. This includes: all milking equipment, milking procedures, milking parlour and barn-everywhere the cows go must be kept clean and well maintained.
- Biotechnology has created better livestock and crop varieties that are more disease-resistant or better quality. Biotechnology has improved foods, feeds, fertilizers, disease vaccines and pest control products so they have more desirable traits that they had before. Biotechnology uses biological processes to produce substances that help agri-food production, the environment, industry and medicine. This has been going on for thousands of years. For example technology has:
    1. developed plants through genetics which are more nutritious;
    2. developed animal vaccines using microorganisms;
    3. developed plants that take nitrogen from the air more effectively and therefore help reduce the amount of nitrogen fertilizers needed;
    4. introduced computers to keep track of how much each cow eats, how much milk each cow produces and even to match a particular cow with a particular bull for breeding. Farmers also use them for finding information (internet) and financial accounting.

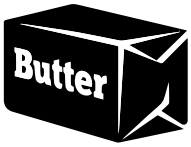


- To ensure the safety of milk, it is pasteurized. This is the process of heating milk quickly to 72°C and cooling it very rapidly to 4°C. This kills any harmful bacteria that may find its way into milk. Pasteurizing milk helps keep milk fresh longer by destroying spoilage bacteria.
- To insure milk quality and safety it undergoes many tests by a certified laboratory, before it is accepted. Other tests are carried out from time to time to ensure purity of the product.

Related Dairy Facts

- Before homogenization, the cream always rose to the top. Today, most milk is homogenized. Homogenization ensures that the cream is thoroughly mixed throughout the product so that it does not separate out. This process doesn't alter any of the nutrients found in milk.
- Throughout the entire process from the time the cow is milked until the milk is packaged, milk is never touched by human hands.
- The dairy (processing plant) is also inspected regularly for cleanliness, handling procedures and equipment standards. All milk contact equipment is cleansed and sanitized on a daily basis; failure to do so would result in bacterial spoilage before the "best before" date found on every milk container. Every dairy and their employees who work in the processing area must be trained in food safety and licensed.
- Milk is usually packaged within 24 hours of arriving at a dairy plant.
- Even packaged dairy products are regularly tested by a certified laboratory for composition to ensure the product contains what it claims. This is also the final check point to ensure the product meets the standards established for quality and safety.
- Dairy products at retail outlets are subject to random sampling as a further check of their safety, quality and composition.
- The New World had its first exposure to domestic cattle in 1518, but it wasn't until Samuel de Champlain brought them to Quebec in 1608 that they became an enduring part of North American agriculture.
- By 1660, breeding cows brought from Brittany and Normandy became the basis of the only breed of dairy cow developed in Canada-called appropriately enough - the Canadienne.
- 1884 Milk bottle invented by Dr. Hervey D. Thatcher, Potsdam, New York.
- In the 1890s there were no cars, few telephones and little electricity. Most of the work now done by gasoline and diesel powered equipment was done by the 17,000 horses in use on BC. Farms in 1894.
- By 1900, modern milk distribution on a large scale began in Toronto, Montreal and Ottawa.
- The Canadian dairy sector has developed a cattle population of the highest genetic level in the world. This is based on strong milk recording and genetic evaluation programs, which have been in place in Canada since 1905.
- 1964 plastic milk container introduced commercially.

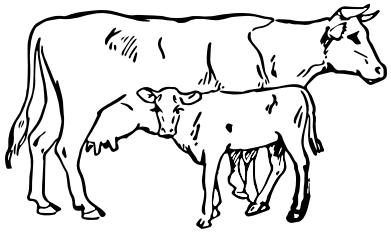
Related Dairy Facts



- 1973 BC entered the milk market-sharing quota agreement (model developed in 1970).
- Every dairy farm in BC, and across Canada, is registered under the Dairy Farmers of Canada's proAction program.
- Milk producers must strive for efficiency. They must become experts in many areas if the farm is to compete in today's markets. They must be registered on the national proAction program through which they demonstrate responsible stewardship of their animals and the environment, and sustainably produce high quality, safe, and nutritious food for consumers. They must:
    1. work within the framework of milk pricing and quota systems;
    2. make optimum use of available feeds and strike a balance between costs and herd productivity;
    3. make good housing, feeding and production decisions in the cows best interest and health;
    4. keep records to monitor business decisions, herd improvements, health and production and improvement of cow productivity through breed selection; and
    5. promote land stewardship through effective cropping, soil management and minimize impacts on wildlife, water and air quality.
- Canadian cattle are free of all major cattle diseases, mostly due to its strict standards for disease control. This is the responsibility of the Canadian Farm Inspection Agency. Bovine spongiform encephalopathy (BSE) or Mad Cow Disease does not exist in Canada.
- Canadian dairy cattle, recognized for their disease-free status and their ability to produce high quantities of milk, are exported to over 50 countries. Major export markets are the United States, the United Kingdom, Mexico, Italy, Switzerland, Spain, Australia, Germany, Japan and Brazil.
- Milk is natural-nothing is added except vitamins A and D which is required by law. Milk remains one of the purest and safest foods available.
- Milk is 89% water and 11% solids. The nutrients, such as calcium, riboflavin, vitamin A and protein are in the solids.

Related Dairy Facts

- Milk, cheese and yoghurt contain 6 of the 8 nutrients of concern in the Canadian diet: calcium, magnesium, zinc, potassium, vitamin A, and vitamin D. In addition, milk is an important source of protein, riboflavin, vitamin B6, vitamin B12 and many other nutrients.
- For more information visit www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/animal-production/dairy



Glossary

Amino Acids	Nitrogen containing compounds that are the building blocks from which proteins are made.
Antibiotics	A class of drug usually produced by living organisms (moulds, bacteria or green plants), which can inhibit or kill undesirable bacteria. Example: penicillin.
Bacteria	Microscopic unicellular organisms found almost everywhere.
Barn	Place where animals, feed and/or machinery may be housed.
Breed	Variety of animals within a species. To produce offspring.
Bull	Adult male. Potentially a very strong, dangerous animal needed to be treated with respect and distance.
Butter	Fatty substance made from cream by stirring.
Calf	Young cattle that are between 0 and 6 months of age.
Carbohydrates	Major energy providing substrates including starches, sugars, cellulose and hemicellulose. All carbohydrates contain carbon, hydrogen and oxygen, and are usually divided into two fractions: structural (fiber) and non-structural (sugars and starches).
Churn	An old fashioned piece of equipment used to make butter from cream.
Colostrum	The milk secreted by female mammals for the first few days after giving birth. It is particularly rich in nutrients and antibodies essential for newborn survival.
Cow	Mature female cattle that are over 24 months of age and have given birth.
Cream	Fat part of milk, which in unhomogenized milk would gather on top of the milk.
Digestion	The changes that occur to a feed within the animal's digestive tract to prepare it for absorption and use.

Glossary

Dry matter	Feed residue left after all moisture has been removed by drying (100% dry matter).
Energy	A nutrient essential for maintenance, growth, production and reproduction. Energy is required in larger amounts than any other nutrient except water, and is often the limiting factor in livestock production.
Enzyme	A complex protein compound produced in living cells which speeds up chemical reactions without itself being changed or destroyed. It is added to animal feeds to supplement low enzyme production by some young animals or to improve utilization of feeds.
Escherichia coli (E. coli)	E. Coli is of the coliform group, which are organisms associated with the intestinal tract flora. Presence of coliforms is usually an indication of unsanitary handling or processing procedures.
Farm holding tank	A refrigerated stainless steel tank used to store milk and keep it cool between 0 and 4°C.
Fat (nutrient)	A term used in a general sense to refer to both fats and oils. Fat supplies 2.25 times as much energy as carbohydrates. Both fats and oils share the same general structure and chemical properties, but have different physical properties, i.e., oil is a liquid at room temperature, while fat is a solid.
Feed additives	Products added to basic feed mixes to improve the rate and/or efficiency of gain, prevent certain diseases, or preserve feeds.
Food-borne illness	The sickness resulting from eating food contaminated with either bacterial toxins or by certain bacteria in the food, often resulting in vomiting and/or diarrhea.
Forage	Plants or plant parts fed to, or grazed by, domestic animals. Forage may be fresh, dry or fermented (pasture, green chop, hay, haylage or silage). Term is often used interchangeably with roughage.
Free stall	Bedding area in a barn, that holds one cow. Cow can come and go as she pleases.

Glossary

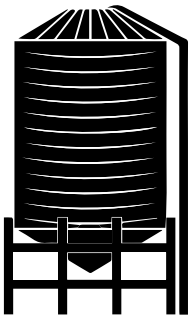
Grain	Any of the common cereal seeds e.g. oats, barley, wheat.
Hay	Dried, cut forage packaged in the form of bales that can be small square bales weighing around 35 kg to large 1 tonne round or square bales.
Heifer	A young cow between the ages of 6 months and 24 months that has not had a calf.
Homogenize	To process milk so that the fat globules are finely divided and emulsified that the cream does not separate on standing.
Metabolism	All of the chemical changes nutrients undergo following absorption from the digestive tract.
Microorganism	Any microscopic animal or plant-like organism including bacteria, yeasts, viruses and single-celled algae.
Milk replacer	A substitute for fresh whole milk, fortified with vitamins, minerals and sometimes antibiotics; used as a nutrient source for young animals.
Minerals	Inorganic feed elements essential for life.
Mineral supplement	A rich source of one or more mineral elements.
Nutrients	Feed components required for the maintenance, production and health of animals (water, carbohydrates, lipids, proteins, minerals and vitamins).
Nutrient requirements	The minimal amounts of nutrients (energy, protein, minerals and vitamins) necessary to meet an animal's minimal needs for maintenance, growth, reproduction, lactation or work.
Palatability	The appeal and acceptability of feedstuffs. Affected by the taste, odour, texture and temperature of the feed.
Parlour	Area in the barn used to milk cows.
Pasteurize	The controlled heating of a food to a very high temperature for a very short time period in order to destroy all harmful bacteria.

Glossary

Pathogen	Any microorganism that can cause disease. Salmonella is always considered a pathogenic microorganism. E. Coli is considered an opportunistic pathogen. It is not always pathogenic, but given the opportunity, it can cause foodborne illness.
pH	A measure of acidity or alkalinity. Values range from 0 (most acidic) to 14 (most alkaline or basic). A pH value of 7.0 is neutral (neither acidic nor alkaline).
Pasture	A fenced grass field.
Protein	Naturally occurring compounds containing nitrogen, carbon, hydrogen and oxygen, and sometimes sulphur or phosphorus. Proteins are made up of complex combinations of amino acids and are essential for animal growth, production and reproduction.
Ration	A diet that may include grains, minerals, vitamins, salt, forages. The 24 hour feed allowance for an individual animal.
Roughage	A term used to describe a feed high in fibre (greater than 18% crude fibre). Roughage tends to be bulky, coarse, and low in energy. Example: straw.
Ruminant	A cud-chewing animal having four stomach compartments. The rumen (first stomach), is a major site of microbial fermentation of feeds permitting breakdown of fibre. Examples of ruminants: cattle, sheep, goats.
Salmonella	A group of organisms named after a U.S. veterinarian, D.E. Salmon. There are over 2,000 species within the genus Salmonella that will infect man. These rod shaped bacteria cause various diseases in man and animals, including typhoid fever and food poisoning.
Separator	A type of equipment used to separate milk from the cream.
Silage	Feed preserved by an anaerobic (no oxygen) fermentation process. Examples: corn silage, haylage, high moisture corn.

Glossary

Silo	Structure used to store forage. Stores it in a manner that prevents spoilage over long periods of time.
Skim	To skim is to remove the cream or fat from the liquid (milk).
Steer	A castrated bull.
Sterilization	The process of eliminating all viable life forms; nothing is left living in a sterilized product.
Teats	Nipples on the udder. The baby calf nurses by instinct.
Total mixed ration (TMR)	All ration ingredients, including roughages, mixed mechanically to provide one homogenous mixture. TMRs are used in large dairy or beef feedlot operations.
Udder	The part of the cow that produces milk (mammary gland).
Vitamins	Organic compounds that function as parts of enzyme systems essential for many metabolic functions



Support Materials

Support Materials available from:

British Columbia Agriculture in the Classroom
1767 Angus Campbell Road
Abbotsford, BC
V3G 2M3

www.bcaitc.ca

BC Dairy Association
3236 Beta Avenue
Burnaby, BC V5G 4K4

www.bcdairy.ca