

Cattle Production and the Environment

Just Facts

The *Just Facts* booklet was originally published in July 1995. The facts and figures in the *Just Facts* document presented here are current as at November 2000.

By Canada's Beef Cattle Producers

Canadian cattle producers are long-time partners with the environment and in the production of wholesome beef. Many years of experience have made us one of the most knowledgeable industries dedicated to conserving and enhancing the environmental and economic sustainability of agriculture.

Just Facts is published by the Canadian beef industry to provide accurate information about beef cattle and their role in environmental sustainability, as well as other consumer information.

We recognize that many of the topics within this booklet are complex in nature. For that reason, we have thoroughly researched the facts and support them with documented reference materials and contact names for experts in the field. Readers are welcome to call upon us for the names of leading authorities and/or supporting documentation for Just Facts.

It is with pride that we portray the management practices of the Canadian cattle industry. We know our efforts count and will help to create a healthy and sustainable economy for Canadians.

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Cattle Production and the Environment

Canadian cattle producers are long-time partners with the environment and in the production of wholesome beef. Many years of experience have made us one of the most knowledgeable industries dedicated to conserving and enhancing the environmental and economic sustainability of agriculture

Beef Cattle

Beef cattle are ruminant animals capable of digesting fibrous material that cannot be used by people and converting it into wholesome, high-protein food suitable for human consumption.

Canadian's 13 million cattle spend most of their lives grazing on land unsuitable for crop production, or on land that is part of an integrated and sustainable cropping system. However, in the winter, cows are kept on rangeland, in woodlots, or in loose housing. During this season, they are provided with hay and other forages which have been cut, dried, and stored the previous summer.

In autumn, calves are separated from the cows. They are used to replenish cow herds, or are sold to feedlots. Light weight calves are backgrounded on high forage diets to increase their weight. The animals going to feedlots will range from 272 kilograms (600 pounds) to 408 kilograms (900 pounds). At these facilities, they are fed nutritionally balanced rations of hay, silage and feed grains (barley or corn). Cattle may also be fed food manufacturing by-products such as cull potatoes, tomato pomace and sugar beet pulp.

Once the animal weighs between 455 kilograms (1,000 pound) and 546 kilograms (1,200 pounds), it is sold to a processing plant. Careful feeding and handling of cattle are essential to ensure a high quality product for the consumer.

Canada produces approximately 1.4 billion kilograms (3 billion pounds) of beef annually. Canadians purchase about 23 kilograms (51 pounds) per year. Canada exports approximately 400 million kilograms (880 million pounds) of beef yearly, primarily to the United States, Mexico, Japan, and other Pacific Rim markets.

The Canadian beef industry is an important producer of a food that provides a valuable contribution to the nation.

Just Facts

Fact – 32% (103,673) of Canadian farms report a beef cattle population with an average of 45 beef cows per farm (1996)

Fact – 20% (\$6.2 billion) of Canadian farm cash receipts are contributed by the cattle industry (1999)

Fact – About 3% (410,000) of Canada's workforce are employed in agriculture

Fact – 501,530 people list their major occupation as farm-related; 202,360 people have a part-time farm related job

Fact – 68 million hectares (168 million acres) of farmland in Canada (1996)

Fact – 23% of all Canadian farmland is native grass (uncultivated) and used for pasture grazing or hay (1996)

Fact – 6% of all Canadian farmland has been cultivated and seeded to tame grasses (1996)

Fact – 276,548 farms are located in Canada (1996)

Fact – The meat processing industry is Canada's fourth largest manufacturing industry, ranking behind motor vehicles, petroleum products, and sawmills

Fact – 31,312 manufacturing jobs are attributed specifically to the meat processing industry, paying \$1,107 million in salaries and wages per year (1997)

Fact – The cattle industry contributes approximately \$25 billion to the Canadian economy (1999)

Fact – Sales of \$10.9 billion in 1997 – a new record high.

Water Management

FACT: *High quality water is conserved and maintained by cattle producers.*

High quality water is important to everyone. New technology is offering cattle producers innovative ways to water their cattle. Producers are experimenting with methods of encouraging less direct access by cattle to water courses.

When given the option, cattle tend to water at sites with a solid base that provides good footing. Access ramps can be built out into the water using compacted pit run gravel. Producers can use a plastic mesh on the edge of watering sites to give cattle better footing and to decrease water siltation. Research and practical experience indicates that cattle will often choose to drink out of a water trough, rather than drink from a stream or dugout.

Some water consumption facts are:

130 litres (29 gallons) to produce 1 kilogram (2.2 pounds) of beef.

15 litres (3.3 gallons) to make 0.1 kilogram (1/4 pound) of hamburger.

32 litres (7 gallons) to flush a toilet.

135 litres (30 gallons) for the average shower.

35 litres (7.7 gallons) to process one can of vegetables.

5,678 (1,249 gallons) to produce a barrel of beer.

The average Canadian uses 350 litres (77 gallons) of water a day in normal living activities. A mature beef animal will drink between 35 and 66 litres (8 to 15 gallons) of water per day, depending on the temperature. Most of the water cattle drink returns to the soil as part of the natural recycling process.

Clean water is a goal of cattle producers. Producers are voluntarily changing management practices to improve water quality for themselves and for their communities. These practices include moving wintering areas away from streams, using ridges and ditches to divert corral run off into lagoons, and sloping corrals away from water sources.

Irrigation is not widely used in Canada to produce feed for cattle. In fact, only 1% of Canada's total farmland is irrigated.

Land Management – Effective and Sensible Use

FACT: *Cattle production occurs primarily on land unsuitable for cultivation.*

Worldwide, grazing more than doubles the land area that can be used to produce food for people. In Canada, about 68 million hectares of land is classified as “agricultural land”. Approximately 30% of Canada’s farmland is NOT considered to be economically or environmentally suitable for cultivation, but does support sustained ruminant livestock grazing. Because of climate, topography, access, or land owner choice, almost 24% of Canada’s agricultural land is uncultivated native grasslands. Another 6% is maintained as tame grass pasture land.

Cattle are an important element in a balanced and sustainable agriculture system. They utilize the forages and legumes which are part of a crop rotation system to improve soil fertility and decrease soil erosion. Forage crops used for cattle feed are an important part of most sustainable cropping systems. They help to decrease soil erosion, improve soil fertility, and assist in pest management.

80% to 85% of the feed consumed by cattle is made up of grasses and forages that are inedible by people. The type of grain fed to cattle (normally barley or corn) is generally not the same quality as that used for human consumption. Cattle often provide a market for weather damaged cereal grains originally grown for human consumption. There is no shortage of grain in the world, only an inability to distribute it to those in need.

It takes approximately 2.2 kilograms (5 pounds) of feed grain to produce 0.5 kilograms (1 pound) of edible beef. (This is comparable to the feed grain conversion efficiency of other major meat animals).

Livestock industries in developed countries also have an important buffering effect on cereal grain prices and food supplies. As grain prices rise, the amount of grain used in cattle feedlots decreases. The cattle industry can utilize surplus grains in times of over-production, or reduce that use in times of scarcity through shorter finishing periods and an increased use of by-products.

In certain regions of Canada, climatic conditions restrict the production of food grains suitable for human consumption and favour the production of feed grains for livestock. In fact, food grains on average yield less per hectare than feed grains.

Manure Management

FACT: Almost all animal manure is incorporated back into the soil for crop production or sold as natural fertilizer to gardeners.

Animal manure is a valuable source of soil organic matter and nutrients. When properly applied, it improves soil structure and increases water retention.

When soils are cultivated for crops, organic matter is used by the growing plants. Replenishment of those nutrients is essential to sustained and economically viable crop production.

Producers are using manure management techniques to significantly reduce chances of ground or surface water contamination. Ongoing research is assisting producers to determine appropriate manure application rates using soil testing and manure analysis.

Agriculture and Agri-Food Canada scientists have determined that the heavy application of manure to soil is an effective way to restore the productivity of saline and other degraded soils. Manure deposited on pasture and rangelands is dispersed naturally and acts as a fertilizer for the grasses.

In some areas, producers are planting trees and grasses along streams to help filter barn yard run off.

Biodiversity

FACT: Cattle grazing on properly managed range and pasture land is compatible with wildlife and wildlife habitat, and in many cases contributes to increased wildlife numbers.

Cattle producers are long-time partners with the environment and work to conserve wildlife and its habitat. To ensure the coexistence of species, total environment management is the focus of producers.

Many producers are second, third and fourth generation families who have built up extensive knowledge about good management of the many different and complex range and pasture ecosystems they utilize.

Before cattle, bison grazed the Prairies and parts of the aspen parkland. Removal of grazing animals would lead to significant habitat changes and the loss or decrease of many prairie plant and animal species.

Improved grazing management, more widely available watering sites and improved winter feed supplies have increased wildlife numbers in many areas. Good range management ensures the maintenance of natural ecosystems.

Cattle production, species biodiversity, recreation and wildlife habitat are all possible, side by side through education, awareness and cooperative management. Cattle producers are working with conservation and recreational groups to enhance habitat in many areas. Voluntary habitat enhancement and stewardship programs are in place with a variety of organizations. Initiatives include practices such as direct pasture seeding, native grass cropping, man-made wetlands, and rotational and deferred grazing strategies.

Global Warming

FACT: Canadian cattle contribute approximately 0.025% of the greenhouse effect from methane emissions in the world.

Carbon dioxide, nitrous oxide, methane and chlorofluorocarbons are called greenhouse gases. These gases form an envelope around the earth to contain our atmosphere and decrease the amount of ultraviolet rays that reach the surface.

Plants use carbon dioxide to produce cellulose and starch during the photosynthesis process. The methane by cattle comes from the digestion of plant material in the rumen (the first of the four stomachs).

The carbon production from cattle, in the form of methane belched into the air, is not the same as the carbon produced when fossil fuels are burned. Cattle are recycling carbon that was once in the atmosphere. This carbon is either sequestered by the soil or by the grasses the grazing cattle eat. Cattle are a link in the nutrient recycling process.

Cattle are part of the carbon cycle. Carbon in the atmosphere is taken in by plants and converted to cellulose and starch during the photosynthesis process. This plant material is then digested by cattle who release some of the carbon contained by the plant back into the atmosphere in the form of methane.

A study at Cornell University, New York, calculated that the entire beef cattle population in the world contributes 1.0% of the greenhouse gases in the atmosphere.

The average daily production of greenhouse gas by a cow is equal to that of a car driven 3.2 kilometres. In fact, driving to the store to buy groceries produces 800 times more greenhouse gas than does the production of a hamburger. One landfill site in the Vancouver area creates more methane emissions each year than all cattle in British Columbia.

Deforestation

FACT: Reducing beef consumption in Canada will have no impact on rates of tropical deforestation.

A recent study at the University of Guelph, Ontario, found that the social and economic conditions in South and Central America are responsible for deforestation. The study further states that in order to slow forest depletion in South and Central America, emphasis should be placed on domestic causes of forest depletion, rather than on North American beef consumption.

Beef imports into North America have been declining, but forest depletion in South and Central America is continuing. The study identifies regional development, subsistence production, shifting cultivation, fuelwood and charcoal production, the debt burden, forest fires, pasture development, and national agricultural policies as potential contributors to forest depletion.

Causes of Deforestation:

Peasant agriculture – 77,200 square miles/year

Timber ranching – 28,000 square miles/year

Cattle ranching – 7,720 square miles/year

During 2000, Canada imported approximately 27% of its beef needs – primarily from the United States, Australia and New Zealand. Canada imports less than 2.3% of its beef from South America. Trade is very fluid. The amount of beef Canada imports varies considerably from year to year.

Currently, Canada does not import beef from Central American countries.

Curtailing beef consumption in Canada will only hurt domestic beef producers and thousands of other Canadians employed in the industry.

Healthy Cattle

FACT: *Canada has one of the healthiest national cattle herds and one of the most wholesome beef products in the world.*

Producers use livestock medication and vaccination products to make sure their cattle are healthy. Antibiotics are used in cattle production to treat disease. These products go through the same rigorous testing as products licensed for human use.

Implanting a growth-enhancing hormone in the ears of cattle helps produce leaner beef. When an implant is used, hormones are gradually released into the bloodstream to increase lean beef production by 10% to 15%. This lowers the cost of beef to the consumers.

The human body continuously produces hormones in quantities substantially greater than that which would be consumed by eating beef. For example, scientific studies show no significant difference between the amount of estrogen in cattle treated with a growth-promoting implant and the amount found in an untreated animal.

Estrogen Content in Some Common Foods

Steer (beef) implanted	100 g (3 ½ oz)	1.4 – 2.5*
Steer (beef) non-implanted	100 g (3 ½ oz)	1.2 – 2.0*
Cabbage	100 g (3 ½ oz)	2,400*
Peas	100 g (3 ½ oz)	400*
Wheat germ	15 ml (1 tbsp.)	152*
Soy bean oil	15 ml (1 tbsp.)	28,370*
Milk	250 ml (1 cup)	34*

*Measurements are in nanograms. A nanogram is one billionth of a gram, which can be compared to one blade of grass in an entire football field.

Canadian producers have an excellent long-standing reputation for compliance with Canadian regulations for antibiotics, pesticides and hormones based on the random and suspect residue testing program.

The industry took a lead role in developing a *Code of Practice for the care and handling of farm animals: Beef Cattle*. This document is the result of expertise held by the provincial cattle organizations, government and the Canadian Federation of Humane Societies.

The *Federal Health of Animals Act* regulates the care and handling of livestock throughout the industry. This includes the humane treatment of cattle and governs transportation, and the care, handling and disposition of animals at processing plants.

Cattle producers know that badly treated or stressed cattle will not reproduce or grow normally. Any animal owners causing animals unnecessary suffering face monetary fines, possible charges under the Criminal Code and the removal of their animals.

Meat Inspection

FACT: Canadian meat inspection has the reputation of being one of the best in the world.

The Canadian beef industry, which includes producers, packers, veterinarians, retailers, the food service industry and government, is committed to maintaining high standards in safety practices.

Quality assurance in the beef industry is the goal of a program known as HACCP (Hazard Analysis Critical Control Point). It is aimed at preventing biological, chemical, or physical contamination of products that would pose a safety risk for consumers. It utilizes a total quality management approach for the prevention of problems.

HACCP is internationally respected as the best system for producing safe food. This common sense program can be applied to all aspects of beef production and handling. Canadian packing plants are well advanced in developing and adopting HACCP systems. HACCP programs add new scientific approaches to inspection, improving upon the traditional “visual” inspection methods.

Trained inspectors and/or veterinarians visually examine animals for evidence of recent disease or health treatment. The carcasses, organs and finished produces are carefully inspected to ensure that Canada’s high standards are met.

As a result of careful product handling, Canada has earned a reputation for assuring that food is safe and wholesome for consumers.

Beef By-Products

FACT: Beef by-products serve as source materials for other industries, including pharmaceuticals, chemicals and textiles.

We normally associate beef as being part of a satisfying meal. However, because 95% of the beef animal is utilized, items manufactured from beef by-products are all around us. Leather products, car tires, and a variety of medicines all contain a beef by-product.

The medical world relies on beef by-products for many life saving or life improving medications and treatments. Our bodies can easily accept a medication or treatment made with beef by-products.

Automobile tires contain stearic acid, which makes the rubber hold its shape under continuous surface friction. Even the asphalt on our roadways contains a binding agent derived from the fat of beef cattle.

The creation of beef by-products is an important way for the beef industry, to reuse and recycle.

Nutrition

FACT: Beef is an important source of essential nutrients.

Today's lean beef supplies 12 essential nutrients. Beef is an excellent source of protein, niacin, vitamins B6 and B12, phosphorus and zinc. It is also rich in iron, riboflavin, magnesium and potassium.

The iron in beef is in a form called "heme" iron, which the body more readily uses than the iron found in plant foods (e.g. spinach, cereals, legumes) or eggs.

The latest *Health Canada* nutrient information shows that through genetic selection and feeding regimes, today's beef is, on average, 50% leaner and 21% lower in cholesterol than it was 20 years ago. A serving of broiled inside round steak has as little fat and cholesterol as an equal serving of roast chicken without the skin, or as little fat as ½ cup (125 millilitres) of regular cottage cheese.

Canada's Food Guide to Healthy Eating suggests 2-3 servings (50-100 grams each) of lean meat per day. A serving size is approximately the size of a deck of cards. *The Nutrition Recommendations for Canadians, 1990*, states that we should consume no more than 30% of calories from fat, and no more than 10% of calories from saturated fat. For a person who consumes 2,000 calories daily, this translates into no more than 67 grams of total fat and 22 grams of which could be saturated fat. It is also recommended that, regardless of total caloric intake, cholesterol intake should not exceed 300 milligrams per day.

Lean beef fits well within these guidelines. For example, a 100 gram serving of broiled sirloin steak, trimmed of visible fat, provides 186 calories, 6.7 grams of fat, 2.7 grams of saturated fat and 72 milligrams of cholesterol.

Data from Agriculture and Agri-Food Canada's Nutrient Assessment Program, shows that red meat, such as beef, contributes only 6.4% of the fat in Canadians' diets. In fact, the major source of fat in our diets is from fats and oils which are often added during the fat in our diets, almost five times greater than that from beef.

High intakes of dietary fat have been associated with increased risks of heart disease and colon cancer. The data shows that beef can be part of a daily balanced diet that is both low in fat and nutrient dense.

Science & Technology

FACT: Science and technology play an important role within the beef cattle industry.

The Canadian cattle industry is pursuing technologies that will help it remain competitive, improve the quality and consistency of the product for consumers, and increase food safety standards.

Video imaging and real-time ultrasound are used to grade cattle and the resulting products. These technologies measure product yield, which is important to being competitive. In addition, a variety of quality factors can be measured.

Through the use of assessment electronic probes, the collagen and tenderness of beef are tested. This technology places the Canadian cattle industry as a world leader for providing tender beef products.

Electronic identification of cattle, when linked with video imaging and ultrasound techniques, benefits the industry through better animal selection.

Biotechnology is being used to create improved medicines to fight animal diseases and to rid animals of parasites. Modern biotechnology can help develop hardier, more productive livestock faster than was possible with traditional methods. Some of the findings of biotechnology include: Monoclonal Antibodies to diagnose diseases, DNA probes to detect and predict inherited genetic disorders, and DNA fingerprinting to identify the parentage of specific animals.

All products derived from biotechnology are evaluated under safety acts and regulations.

Agriculture and Agri-Food Canada conducts extensive research in targeted areas to develop new processes, improved products and safety measures.