The Real Dirt on Farming II

Questions about where your food comes from?

People in agriculture answer them with the straight goods.

Trying to eat local?

Wondering about hormones, pesticides and antibiotics?

Canadian Farming

– Coast to Coast, what does it look like?

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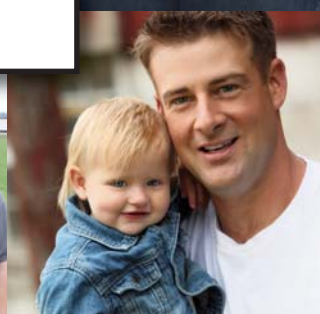


Dear Reader,

We hope you've had the opportunity to visit a local fair, farmers' market, roadside stand, or pick-your-own farm recently. These are among the too few opportunities we have to meet face to face.

Usually there's a crowd of people between us — food processors, distributors, supermarket managers and restaurateurs – so it's not easy for us to get acquainted.

It seems incredible that a century ago, over half of Canada's population was farmers. Today, it's down to two per cent. Just as remarkable is the leap in our productivity: where our grandparents or great-grandparents could produce enough food for 10 people, today's farmer can feed well over 120. Our productivity has jumped by 300 per cent since the 1950s but at the same time, we're using fewer resources, less land and newer, better technologies to produce more food.

Continual innovation, specialization and persistence have brought us light years ahead in the production of top quality, abundant, safe and well-priced products of which we're proud. But this demographic shift has put no small distance between us, the entrepreneurs who grow our food and the people who eat it.

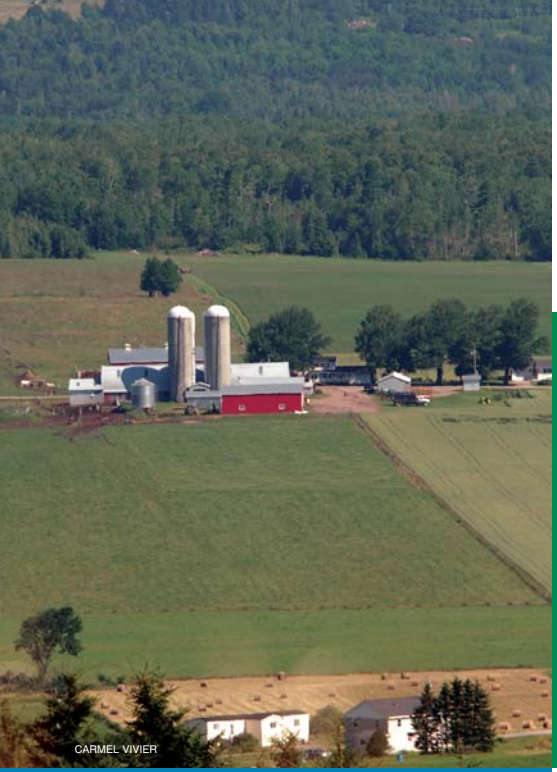
As our most important customers, your needs, concerns and preferences are very important to us. In these pages, we hope to answer some of the common questions we hear in the news, clear up misconceptions, and generally give you some insight into what's up, down on the 21st century farm in Canada today.

We'd like you to know more about us and our way of life. Despite all the technology in the world, it's still hard work and no one knows better than us that Mother Nature can be a tough boss. No matter what we do to care for our animals and our crops, she's ultimately responsible for the weather and for the health of the livestock and products that we raise.

But, at the end of the day, even if we are combining our fields in the middle of the night to get our crops in or missing a family dinner because we're helping a cow give birth, we farm because we choose to. We're committed to this way of life and most of us wouldn't trade it for anything.

If you have questions that we haven't answered or you'd like more information on anything related to food and farming, please contact any of the groups listed at the end of the book. Thank you for taking the time to find out about us and how we grow your food, and thank you for buying our products. We truly appreciate it.

Sincerely,
Canada's farmers from coast to coast


CARMEL VIVIER

Farming – The Big Picture

What does today's farm look like? When the only constant is change, we must be nimble, creative and adaptable—whether it's what we produce, how we produce it, or how it gets to market.

Farmers are mostly independent entrepreneurs, each running a small business. It's tough to describe, because no two farms are the same. As farmers, we ride out the same underlying economic and societal trends as other Canadian enterprises, or ignore them at our peril.

Before we delve into specific questions about food production, let's look at key trends in the Canadian farm setting. We hope this provides some context for understanding some of the changes you're seeing in agriculture.

FARMING ON THE ROCK

Between 2001 and 2006, Newfoundland and Labrador had the largest relative decline in farm numbers of all the provinces, decreasing by 13.2 per cent to 558 farms. In that same period, the average farm size in the province increased from 156 to 160 acres.

GRAIN FARMERS OF ONTARIO

IT TAKES MONEY TO MAKE MONEY

In 2009, for every dollar earned in gross sales, Canadian farmers paid out approximately 92 cents in operating expenses. (Source: www.statcan.gc.ca/daily-quotidien/100525/dq100525a-eng.htm)

As the price of fuel and other essentials outpace income earned, farmers must become ever more productive and efficient to stay in business.

THE ECONOMICS OF FARMING

Farming is unique—a way of life and a business. Like most businesses in recent years, many farms have become larger and more specialized to stay competitive. That said, Canadian agriculture is big business: $41.8 billion in sales from horticulture, poultry, crops and livestock production in 2008.

What's Going Up?

- Productivity, productivity, productivity – we're using fewer resources to produce more food on less land.
- Farm size is expanding – while it varies from province to province, the average Canadian farm grew by eight per cent from 2001 to 2006.
- Productive land – we can now grow crops on land that we couldn't use before, like in the Prairies for example, because we have better tools and technologies.
- Our age – the average age of a Canadian farmer is 52.
- Education levels – 38 per cent of men and 48 per cent of women who farm have post-secondary degrees.

What's Going Down?

- The overall number of farms has been falling steadily for years. Statistics Canada counted 229,373 farms in its 2006 census – compared to 728,623 it recorded in 1931!
- The number of small and medium sized farms is decreasing—39 per cent of Canadian farms have gross sales of $25,000 or less, and 27 per cent of farms have gross sales of $25,000–$100,000 (2001–2006).
- The number of young people in farming is slipping: just over nine per cent are under the age 35, which leaves many wondering about the future of this industry.
- In 1931, one in three Canadians lived on a farm. Today, it's only one in 46!

Have big corporations taken over farm ownership?

No. About 98 per cent of Canadian farms are family-owned and operated, and are often handed down from generation to generation. It's difficult to describe a "typical" farm or ranch in Canada because every one of them is unique.

Family farms come in several forms: some are managed by families with one or more members having a job outside the farm to ensure adequate family income; some are "retirement" farms or acreages; and some are farms that are structured like a corporation but often have primarily family members working on them as well as additional paid employees. These larger farms are still family-owned and operated. One key difference is that the family may not need off-farm income to maintain a good standard of living.

Brent Royce raises turkeys in southern Ontario, where he farms with his wife and two young daughters. His farm is a corporation, but one owned by his family.

"It's almost unachievable for most young farmers to buy a whole farm outright as land and buildings have become very expensive," he says. "With a farm being an incorporated business, it makes it easier for the next generation to take over the farm because it allows young farmers to assume the farm piece by piece instead of having to buy it all at once."

Brent was able to take over his farm from his own parents in this way – but farm size or structure doesn't affect how crops or animals are cared for. There are farms of many different sizes in Canada, says Brent, but all produce safe food and at the end of the day, people farm because they love working with animals and the land.

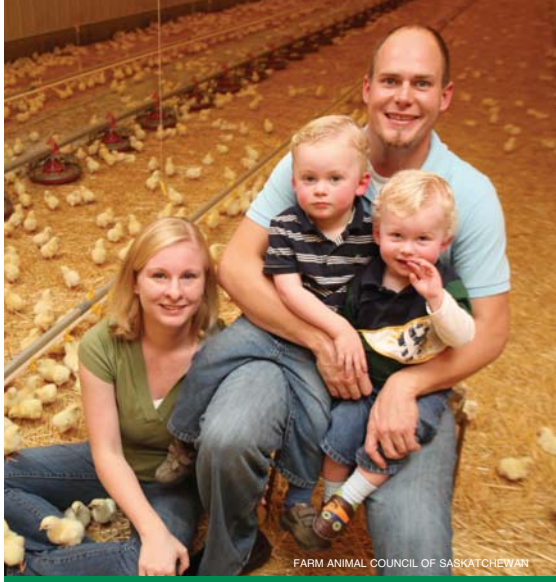
Can we return to smaller, more traditional farms?

The beautiful thing about farming in Canada is you can choose to have five acres or 5,000 acres. With only two per cent feeding the rest of us, it's impossible to go back to many small farms and still feed our country. It's also important to note that the majority of the income of Canada's small farmers comes from off-farm jobs and not actually from the farm itself.

Source: www.statcan.gc.ca/daily-quotidien/080725/dq080725a-eng.htm

People may feel nostalgic for the imagery of farms of yesteryear—but those people who lived and worked on them are rarely nostalgic for that very challenging way of life. The farms' low productivity supported much smaller populations; environmental awareness was much lower and food quality and quantity were highly unpredictable.

The challenge today is to feed a growing world population – we're expected to reach seven billion people in 2011 and nine billion by 2050 – without damaging, depleting or destroying our water, air and soil. For this unprecedented global population, the past can't provide all the answers.



FARM ANIMAL COUNCIL OF SASKATCHEWAN

WHAT ABOUT FACTORY FARMS?

Factory farm is a term created by anti-farming activists and is not one that is used by farmers. Yes, farms are larger than they used to be but thanks to new technologies and modern regulations, our food is safe, our soil and water are carefully managed and our livestock and poultry are well treated and cared for. In Canada, the vast majority of farms are still owned and run by families.

CONTINUAL IMPROVEMENTS

There was no need for this booklet 100 years ago, when over half of Canada's population farmed. Today, less than two per cent are farmers.

But…a farmer in 1900 produced enough food for only 10 people and Canadians spent 50 cents of every dollar earned on food.

Today's farmer can feed well over 120 people and our food costs have plummeted to a meager 10.6 cents of every dollar we earn. Canadians have among the lowest food prices in the world!

HOLLAND MARSH GROWERS' ASSOCIATION

FARMERS TAKE A THIN SLICE OF THE FOOD DOLLAR PIE

Food Freedom Day

Did you know... that in Canada, we mark Food Freedom Day in early February? This is the calendar date when the average Canadian has earned enough income to pay his or her individual grocery bill for the whole year. Canadians enjoy one of the lowest-cost "food baskets" in the world. As a comparison, Food Freedom Day in Iceland is in late February while in Mexico, it doesn't come until early March.

IT'S NOT OLD MCDONALD'S FARM ANYMORE!

To many Canadians, a farm is a red wooden barn with a cow, a couple of pigs and a few chickens in the yard – oh, and a farmer in overalls with a pitchfork in his hand.

That reality is long gone and not reflective of what modern farms - and farmers - are really like. Technology and equipment have made life on the farm a lot easier and a lot safer. Most farms today specialize in a few specific crops or animals – and farmers focus their training and education accordingly.

Research, innovation and lifelong learning has meant continual progress in how we care for soil and water, control pests and diseases, promote animal welfare and ensure we produce safe food.

Only 27 per cent of an entire week's worth of groceries for a family of four (ranging from four percent for grain products to 35% for dairy products) goes back to the farm – and although consumer food prices go up, the amount that goes back to the farmer stays the same or even goes down.

A study conducted in Manitoba showed that even though the cost of a week's worth of groceries for a family of four rose to $194.23 in 2009 from $188.24 the year before, this increase was not passed along to farmers. Consumers paid $6.01 more for groceries during that time period, and farmers received $0.86 less.

The study also showed:

- In 2009, the average cost of two loaves of bread was $4.94, but the farmer received only $0.22.
- Two cups of red pepper cost consumers an average of $4.99 in 2009, while the farmer got $0.22 – compared to $0.40 of the $3.99 cost only the year before.
- 1.2 kilograms of strawberries that cost you $9.78 at the grocery store paid only $1.31 to the farmer who grew them in 2009. In 2008, the farmer received $1.64 out of the $7.98 price.
- The beef farmer received $2.05 in 2009 for the 600 grams of sirloin tip beef that cost you $9.15 in the store. In 2008, the farmer also received $2.05 – but from a consumer price of $4.61.

(Source: Keystone Agricultural Producers, "The Farmers' Share", 2009, http://www.kap.mb.ca/KAP%20Release%20Farmers%27%20Share%2009.pdf)

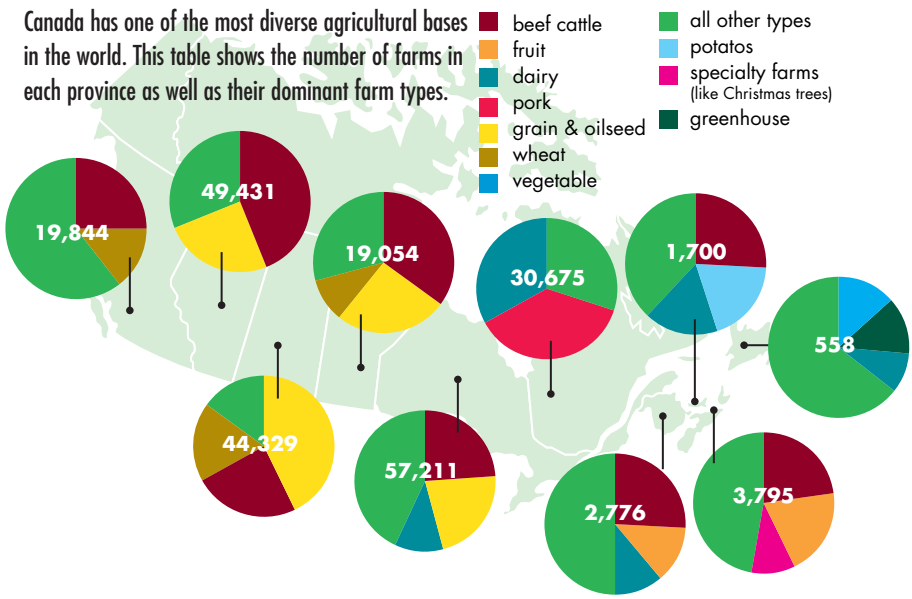
And at restaurants...

Typical menu item	Average price	Farmer's share
Eggs Benedict	$11.92	$0.27 (egg farmer)
All-dressed pizza (medium)	$16.25	$0.69 (dairy farmer)
Grilled chicken breast on rice	$12.00	$0.19 (chicken farmer)
12-inch turkey sub	$5.99	$0.21 (turkey farmer)

(Source: SM-5 – Canada's dairy, poultry and egg farmers, 2009)

REGIONAL ROUNDUP

Canada has one of the most diverse agricultural bases in the world. This table shows the number of farms in each province as well as their dominant farm types.



Note: based on 2006 Census of Agriculture data. For comprehensive statistics, please see Statistics Canada at www.statcan.gc.ca.

POP QUIZ

Which Province...

1 has the largest farms in terms of amount of acres farmed?
a) Alberta
b) Manitoba
c) Saskatchewan

2 has the smallest number of farms?
a) Ontario
b) New Brunswick
c) Newfoundland

3 does not have cattle as its most common farm type?
a) Newfoundland & Labrador
b) British Columbia
c) Quebec

4 produces the most blueberries in Canada?
a) Ontario
b) Nova Scotia
c) British Columbia

5 has the most dairy cows?
a) Quebec
b) Ontario
c) New Brunswick

6 raises the most chickens?
a) Ontario
b) Quebec
c) British Columbia

7 raises the largest number of pigs?
a) Ontario
b) Quebec
c) Manitoba

8 grows the most soybeans?
a) Ontario
b) Alberta
c) Saskatchewan

9 has the highest number of farms producing tree fruits (e.g., peaches & cherries), berries?
a) Ontario
b) British Columbia
c) Nova Scotia

10 has the largest percentage of certified organic farms in Canada?
a) British Columbia
b) Prince Edward Island
c) Saskatchewan

Answers: 1 C. 2 C. 3 A. 4 C. 5 A. 6 A. 7 C. 8 A. 9 B. 10 C.

Source: 2006 census; http://www.cpc-ccp.com/statistics-farms-e.php, http://www.cog.ca/our-work/organic-statistics/

Safe Food Starts on the Farm

WHAT PESTICIDES AND ANIMAL HEALTH PRODUCTS DO – AND DON'T DO!

Man-made products used in agriculture get a rough ride in traditional and social media—so rough, you might wonder why many of us might use them at all. Here are a few of the reasons:

1 **Safety first.** Canada has one of the most stringent product approval, residue monitoring and control systems in the world, with a strong focus on applicator safety and efficacy (how well a product works). When used as directed, any approved pesticides or animal medicines do not harm people, animals or plants, or affect food safety or quality—in fact, they are largely used to improve these attributes.

2 **They work.** For example, pesticides—in tandem with other methods of crop protection—have helped raise the yields and quality of our fruits, vegetables and field crops, as well as the reliability of supply. They've also helped keep food prices affordable. The same is true with the responsible use of animal medications, which have helped improve animal health and overall productivity.

3 **Getting better and safer.** The chemical and medicinal products coming on the market are getting better and better—narrowly targeted, fast-acting, breaking down benignly (in the case of pesticides) and with precise withdrawal* timing (in the case of animal medicines) to minimize the possibility of drug residues in our food and adhere to safety standards and regulations.

* meaning how long it takes the product to leave the animal's body

More behind-the-scenes in chemical safety

Testing, testing – and more testing!

- Before getting anywhere near our food production system, both chemical and animal health products undergo years of testing and trials to prove their safety and effectiveness. They must meet stringent government requirements before being approved.
- An entire agency of Health Canada, the Pest Management Regulatory Agency (PMRA), regulates and monitors pesticides in cooperation with provincial authorities. The PMRA employs hundreds of independent scientists to test all pest control products to ensure they can be used safely before they are approved for use in Canada (www.pmra-arla.gc.ca).
- A similar process is in place for animal health products. Depending on the type of product, it could be regulated by either Health Canada or the Canadian Food Inspection Agency. Pharmaceuticals are regulated by the Veterinary Drugs Directorate, and animal pesticides, such as ear tags to help keep flies away from cattle's faces or some flea treatments for cats and dogs, are under the jurisdiction of the PMRA, both of which are part of Health Canada. Animal biologicals, like vaccines and feed additives must meet the regulatory requirements of the Canadian Centre for Veterinary Biologics or the Feeds Division, both part of the Canadian Food Inspection Agency.
- Getting approval does not mean they're home-free. Government oversight continues – in the form of residue testing and monitoring to make sure our food and water are safe.

Beyond chemistry

- A system called Integrated Pest Management (see page 8) has expanded the range of tools farmers can use to reduce losses to pests and reduce pesticide use too.
- On-farm biosecurity programs – a series of preventative measures to reduce the risk of disease – together with vaccinations and good nutrition, help us keep animals and crops healthy. This cuts down the need for medication or treatments, which is good for the animals and the plants, and saves farmers both time and money.

Common sense

- Farmers live where they work, so they breathe the air and drink the water from their own wells - they also eat the food they grow and take pride in feeding consumers with it too. If they thought using medications and crop protection products responsibly was harmful, they definitely wouldn't be using them!
- Crop protection and animal health products represent an expensive cost of doing business, so farmers only use them when absolutely necessary and in the recommended amounts.
- There's no incentive for farmers to over-use expensive products or to over-medicate their animals. They work hard to keep their costs low so your food costs can remain low as well. Products used as directed by their labels are at their most effective and efficient.
- If our food products were found to have residues, they would be condemned – which means they're destroyed and farmers do not get paid for producing them. This represents a significant loss in farm incomes and farmers can also face significant fines.

Farmer education

- Farmers are always taking courses and attending workshops to make sure they're up to date with latest technologies and farming practices.
- In most provinces, farmers must take a course and pass an exam in order to become certified to purchase and use pesticides. They learn about pest management techniques, preventing pest resistance, how to protect the environment and avoid health risks, proper storage, maintenance of application equipment, and the importance of record-keeping. To keep current, they must be re-certified every five years (see www.pesticidesafety.ca for more info).
- On-farm food safety programs for livestock farmers teach the "quality assurance" basics for safe food, including the importance of proper use of veterinary medicines, with proper withdrawal times before treated animals go to market. Courses for fruit and vegetable growers focus on proper growing, storage and packing techniques to assure safe produce gets to our tables.

Half the pesticides!

In 1983, Ontario farmers and the provincial government set a goal to cut agricultural pesticide use in half within 20 years. By 2003, farmers had reduced their use of agricultural pesticides by 52 per cent - and it continues to decrease by about three per cent every year. Other provinces have seen similar declines.

No zeros here:

- There's no such thing as "zero" when you're hunting for residues. Modern lab equipment and testing methods are so sophisticated now that you're always going to find something. What's important to remember is that what you're finding is in smaller and smaller (and smaller!) quantities. Where we once were looking for parts per million, we're now able to detect parts per billion or even trillion.
- How much is that anyway? One part per billion is the same as one second in 32 years – or $1 out of $1 billion – or one blade of grass in a sports field!

The possibility of chemical residues in my food worries me. Are they permitted, and if so, why?

The more sophisticated our testing methods, the more likely we are to detect the smallest of residue traces, amounts so minute that they won't cause us harm but they still show up in our tests. That said, residues in food are regulated to remain well below the "no effect" level - normally 100 to 1,000 times below that level.

The human body is designed to eliminate low levels of chemicals. Microbial contamination – we commonly call it "food poisoning" — is a much greater and more common threat to human health than minute chemical residues.

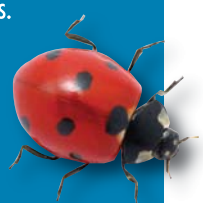
JEANNE WHITEHEAD

HOW DID WE DO IT?

Integrated Pest Management (IPM) is a sophisticated way of controlling disease and pest levels. The system works together with nature: farmers monitor fields and orchards closely to determine when, or if, pest levels reach a threshold where they need to intervene with pest control products. That and a combination of cultivation techniques (such as crop rotation - planting different crops each year), physical barriers, and use of other "beneficial" insects and fungi are making for dramatic reductions in chemical pesticide use.

Advancements in the science of pest management and today's safer, more targeted pest control products are also helping us continually reduce our environmental footprint. And it's making a positive impact on our drinking water too: A recently released study in Ontario indicated a massive decrease of pesticide presence in treated surface water, from 86 per cent of samples in 1986 showing a presence to only three per cent in 2006. Water sources sampled in this study represent about 90 per cent of Ontario's municipal residential water systems.

(Source: www.ene.gov.on.ca/publications/7407e.pdf)



But when animals do get sick…

Just like humans, animals need medicines too. Biosecurity measures and disease prevention programs do not provide total protection from disease. Veterinary medicines are needed to make sick animals healthy – and keep people and other livestock from getting sick.

New diseases are always emerging, so research and innovation for treating animal disease is important. New technologies will be needed to treat new diseases, including innovative treatment and prevention approaches to managing disease – like genetically modified products and technologies yet to be discovered.

LET'S TALK ABOUT ANTIBIOTICS

Keeping animals healthy is a top priority for farmers and veterinarians. A serious health problem can wipe out a farm's or even a whole industry's animals, in addition to causing animals to suffer. Prevention is always preferred over treatment.

Antibiotics — more accurately called "antimicrobials" in farming — are used for the following main reasons:

1. to treat animal diseases that occur, such as pneumonia in individual animals, herds and flocks.
2. to prevent typical and recurring diseases, especially during stressful times of an animal's life like when piglets are weaned from sows and put together with other piglets in a pen.
3. to enhance production by preventing disease, which leads to improved growth and feed efficiency.

Not all farmers use all options. For example, the new organic standards prevent the use of antimicrobials if a farm wants to maintain its organic status. Farmers are careful in their use of these products, most of which require veterinary supervision to be used on farm. Antimicrobials are also expensive and farmers work to minimize their use wherever possible. When their use is called for, they're used in small doses that can be given to individual animals or incorporated directly into the animals' feed or water. A lot of ongoing research is being conducted into alternative treatment options.

The use of antimicrobials for growth promotion is controversial at this time with the main concern being the potential for development of antibiotic resistance by certain bacteria as a result of this use. This is why any product for use on farm animals must meet Health Canada's strict standards for human and animal safety.

A major component of research studies required to support new animal health products coming to market must address the potential for resistance development. Also, the Public Health Agency of Canada's "Canadian Integrated Program for Antimicrobial Resistance Surveillance" (CIPARS) monitors for resistance on the farm, during processing and at the retail level. Visit www.phac-aspc.gc.ca/cipars-picra/index-eng.php to learn more.

Good housing, hygiene, nutrition and vaccines are additional strategies farmers use to maintain and improve herd and flock health.

Healthy animals = Healthy people

Did you know… that animals and people can transmit infectious disease between and amongst each other? Diseases that can spread from animals to people – or vice versa – are called zoonoses.

Fortunately today, many of our veterinary medicines and vaccines help keep both animals and the people that work with them from getting sick. Pet owners, too, face less risk of getting sick from their companion animals due to the use of modern veterinary medicines.

Did you know...
that Canadian research has led to a new vaccine against diarrhea in piglets caused by a strain of *E.coli*? These kinds of innovations help farmers reduce their need for animal medications.

What about antibiotic resistance in people?

Many human diseases are increasingly found to be resistant to antibiotics. Some people point the finger at agriculture, but it's important to remember that as individuals, we have a major role to play here as well. We should only take antibiotics for conditions or problems where antibiotics will actually help – and we must be sure to follow instructions on dose and usage very precisely. Farmers apply those same principles to using these products for their livestock. It's a complicated topic and the jury is still out on it. Farmers continue to watch this issue closely.

A dress code for the barn?

Did you say shower before you go into a barn? Some farmers might ask you to take a shower or wear overalls and plastic boots over your shoes before entering. Other farms don't allow any visitors at all — people or animals. Any guesses why? This is called "biosecurity" and it is one part of an animal health program that helps to keep our herds or flocks healthy. Not allowing visitors into the barn helps to keep germs or sickness out. Farmers can give their livestock medicine when they're sick, but they always prefer prevention over treatment.

Why are hormones sometimes used in beef cattle?

Hormones occur naturally in animals, plants and people. Some beef cattle farmers will use hormone implants to improve how efficiently an animal converts the food it eats to muscle. Improving "feed efficiency" means fewer resources – less feed and water – are used and less manure is produced. This is good for the environment.

However, keep in mind that the level of hormones in beef from cattle given hormonal growth supplements is virtually no different than the level found in beef from cattle not given the supplements. There is more variation in hormone levels of animals of different sexes than between treated and untreated animals. Hormone treatments have been safely used in the Canadian beef industry for more than 30 years.

More importantly, farmers and ranchers take their jobs of producing safe food very seriously. They continue to invest in research into this area and keep a close watch on any new studies to be sure they're using the safest options available. Check out www.beefinfo.org/hormones for more info.

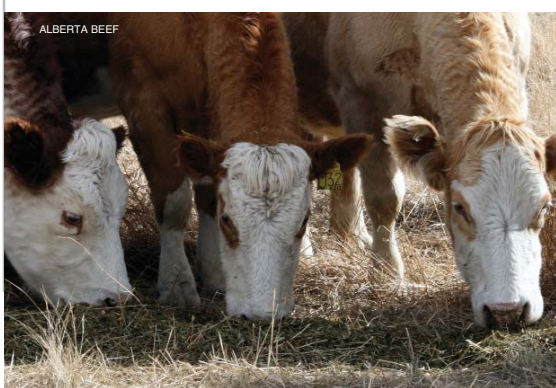
ESTROGEN EVERYWHERE

The level of estrogen in a serving of beef is very low compared to the amount of hormones that we produce naturally in our bodies. A pre-pubescent girl produces 54,000 nanograms (a nanogram = one billionth of a gram) of estrogen daily and a pre-pubescent boy produces 41,600. Adult men and women produce considerably more.

- A single oral contraceptive pill contains 20,000–50,000 nanograms of estrogen.
- A tablespoon (15 ml) of soybean oil contains 28,773 nanograms of estrogen-equivalent activity in the form of "phytoestrogens."
- A 250 ml glass of milk naturally contains 36 nanograms of estrogen.

By comparison, a 100 gram serving of beef from cattle not given growth promotants normally contains about 1.5 nanograms of estrogen. Beef from cattle treated with growth promotants contain only about 2.2 nanograms of estrogen.

In the U.S., a product called rBST (recombinant bovine somatotropin) is approved for use in dairy cows to increase how much milk they produce. It's a hormone which actually occurs naturally in the pituitary glands of all cattle that can be given to cows to boost their milk production. This product is **not** used in Canada.



THE SUPERPOWERS OF… EGG WHITES?

Scientists have found that the proteins in egg whites have antimicrobial properties. They can limit or eliminate bacteria in a few ways: by making nutrients unavailable that the bacteria need, and by destroying parts of bacteria.

Much more than its cracked up to be
Fertile chicken eggs are where many vaccines for people and animals are "hatched" in Canadian labs. To give you an idea, here's but a small sampling of the vaccine types with egg properties:

- Eastern Equine
- Rabies
- Influenza
- Mumps
- Canine Distemper
- Yellow Fever

WHAT YOU NEED TO KNOW ABOUT THE THINGS THAT CONCERN US

Here are six examples of animal and human health issues that we take very seriously. The agri-food industry has invested millions of dollars into research, prevention and emergency preparedness for issues like these – and we continue to do so to ensure we have the healthiest animals and safest food supply possible.

1. H1N1 influenza:

Why was it called "swine flu"?

This virus was originally referred to as "swine flu" because laboratory testing showed that many of its genes were very similar to influenza viruses that normally occur in pigs (swine) in North America. After some study, though, the virus turned out to be quite different, having genes from pig, bird and human flu viruses. In the past, it has been practice to name a virus by associating with a geographic location or an animal species – in this case, pigs.

It is not possible to get H1N1 from eating pork. The virus lives and is entirely contained in the lung of a pig and never goes into the blood or muscle of the animal, so it does not affect the meat. Just like the seasonal flu, the virus can be spread from person to person if someone infected with H1N1 coughs or sneezes.

2. Avian influenza:

Could I catch bird flu from eating eggs or chicken or turkey?

No. As always, follow safe food handling practices and cook poultry meats thoroughly. It is worthwhile knowing that there are no known cases anywhere of someone getting bird flu from eating eggs, turkey or chicken.

About bird flu: First, the bird flu that grabbed headlines in the past was one specific and especially virulent strain of avian influenza known as H5N1. For this strain to infect a person, he/she would have to be in close contact with a great number of infected birds. In some parts of Asia, where humans first contracted this strain of bird flu, it's common for humans to live in close contact with their chickens. It's also part of the culture to purchase chickens at "live markets." Even under these circumstances, it is extremely rare to contract bird flu.

In Canada, during the largest outbreak of a strain of avian influenza (H7N3) in 2004, only a few cases of conjunctivitis (pink eye) were found in farm workers who were exposed to live, sick birds. Despite the severity of the illness in domestic birds, the situation did not pose a human health risk.

While the risk of a large-scale disease outbreak is very low, it's important that poultry farmers continue to work with public health experts to do everything possible to prevent such an occurrence. That's why Canada's egg industry is a partner in the production of eggs used to create vaccines as part of Canada's preparedness plan.

3. E.coli:

The good, the bad and the ugly

The digestive systems of all animals, including humans, are home to billions of essential bacteria. *Escherichia coli* (or *E.coli*) are one group of naturally-occurring bacteria in our intestine. Most types of *E.coli* do not cause illness in healthy humans and some actually assist in the production of vitamins. But some, like *E.coli* 0157:H7, can cause severe illness or even death. This strain is found naturally in wildlife, cattle and other farm animals and enters the environment through their manure.

A new vaccine – developed and produced here in Canada – is now available that aids in the reduction of the amount of *E.coli* 0157:H7 that cattle may shed into the environment. This and other innovations will be important in helping manage food safety hazards.

We need to be vigilant against *E.coli* by ensuring meats are cooked to their proper temperatures and by washing our hands regularly with soap and water after using the washroom or petting animals, and before handling food.

4. Listeria:

What do I need to know about Listeria?

Listeria is a bacterium found in food and elsewhere in nature. It can cause a rare but serious disease called listeriosis, especially among pregnant women, the elderly or individuals with a weakened immune system. Most people who are exposed to the bacteria will either never get sick or show only mild symptoms – often called food poisoning – but in severe cases, it can lead to death. A tragic outbreak in 2008 made Listeria a household word across Canada.

Unlike most bacteria, listeria can survive and sometimes grow on foods being stored in the refrigerator, and more importantly, Listeria-contaminated foods will still look, smell and taste normal. Listeria contamination is not related to how animals are raised and cared for on the farm. Following strict food safety procedures during processing and adhering to proper cooking and handling techniques at home will help prevent listeriosis. Health Canada provides information to consumers to help them have the tools to stay safe.
Check out: www.hc-sc.gc.ca/hl-vs/iyh-vsv/food-aliment/listeria-eng.php for more info.

5. Bovine Spongiform Encephalopathy:

Can I catch mad cow disease from eating beef?

Canada's food safety system protects the safety of Canadian beef and ensures Canadians are not exposed to bovine spongiform encephalopathy (BSE). BSE – more commonly known as mad cow disease – is a rare but fatal disease of the central nervous system of cattle. One of the causes of BSE is believed to have been an increase in the use of meat and bone meal in cattle feed, a practice which was banned in Canada in the late 1990s.

There are many strong measures in place to stop the spread of BSE, including a ban on the use of specified risk materials (SRM). SRM are tissues that, in BSE-infected cattle, contain the agent that may transmit BSE. In Canada, SRM are removed from all cattle, which, according to the Canadian government, is the single most important step in protecting human health. SRM must also not be used in animal feeds, pet foods or fertilizers.

For more information on BSE, see www.bseinfo.ca or www.inspection.gc.ca

6. Foot-and-mouth disease:

How contagious is it?

Foot-and-mouth disease (FMD) is an extremely serious and highly infectious disease that affects cloven-footed animals like cattle, hogs, sheep, goats and deer. FMD is not a food safety issue, though, as meat and meat products from infected animals will not harm humans and our meat inspection system has rules in place to ensure these do not enter the food chain. Canada has been FMD-free since 1952.

CANADIAN CATTLE IDENTIFICATION AGENCY

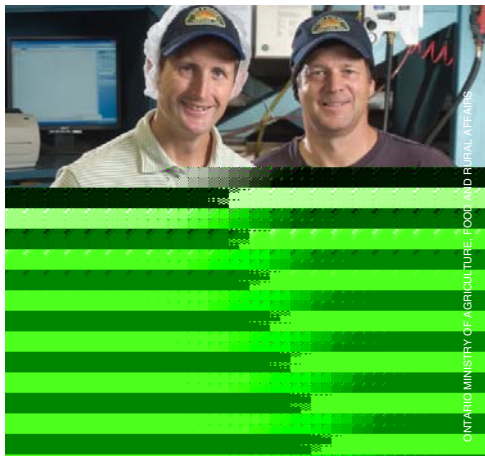
DISAPPEAR WITHOUT A TRACE? NOT A CHANCE IN CANADA

As part of food safety efforts, both dairy and beef cattle farmers are identifying each and every one of their animals with individualized radio frequency identification (RFID) ear tags under the Canadian Cattle Identification Program. Sheep farmers must also follow a mandatory tagging program for their livestock. Livestock identification allows the origins of any serious disease to be traced very rapidly so that its spread can be limited as much and as soon as possible. For more info, visit www.canadaid.ca.

Testing, Testing, Testing....

Did you know… that milk is identified and sampled from every farm before it's put in the milk truck? This is to ensure each tank of milk meets strict government quality standards. In addition to farm samples, every milk truckload is tested at the processing plant. If there's a problem with the milk, the entire load is rejected.

What's Canada doing to keep us and our food supply safe and healthy?



ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS

Traceability is an important word in food production. Essentially, it means being able to trace exactly what went into raising an animal or growing a crop all the way through harvest and/or processing and delivery to consumers.

Hillside Gardens, in Bradford Ontario, is a farm packing operation that has implemented a traceability program for the carrots and onions they grow, as well as the products they broker, sell and package for other farmers and buyers. Their "gate-to-plate" traceability program earned them a Minister's Award for Agri-Food Excellence in 2009.

Using specialized software, they keep track of every input along the way – seed lot-codes, fertilizer and crop protection, whether the product came from their own farm or someone else's, which field it came from, the truck and the driver, and the date it went into storage or into the packing-house. This means they know exactly on which day a specific lot of carrots was packed, what customer it went to and even what size bag was used to pack them.

This kind of information is invaluable in case of a food safety problem as it allows for quick tracking and determination of the potential causes. As well, this kind of information helps farmers make good management decisions – they always know the quality and volume of crop they have available to sell.

To watch a video of Hillside Gardens, check out www.omafra.gov.on.ca/english/food/foodsafety/traceability/industryexamples.htm#1

MAKING FOOD SAFETY A ROUTINE FARM CHORE

Safe food is critical. A food scare – well-founded or not – can be devastating to Canadian consumers and farmers alike. We know how important producing safe, high quality food is. One bad product can ruin an industry, or at least do serious damage. Consumers can switch products, but we cannot switch livelihoods.

That's why food and agriculture industry groups, farmers and government have developed practical protocols that help farmers prevent a problem from happening at - or, if it does happen, take control of it so it doesn't leave – the farm. The bonus: most of the protocols also help improve general farm management, which can often boost farmers' bottom lines.

On-farm food safety programs help identify critical points where food safety could be at risk, like when a new animal is brought on farm or when fresh produce is packed into bins. These same principles are also applied throughout the food chain, such as at animal feed mills and in food processing…and even at your grocery store!

COW IGLOOS?

Have you ever driven past a farm and noticed calves living in what looks like an igloo? These are called calf hutches and are designed to keep calves healthy and comfortable. Hutches allow calves to be fed individually and reduce contact with other animals and 'bugs' that could be in the barn. Farmers give calves extra milk and/or feed and bedding to keep them warm in cold weather too.

CARS OR COWS?

Dairy farmers provide almost three times as many jobs on farms (57,500) than there are employees at General Motors of Canada and Chrysler (20,000 combined). In fact, it takes almost 2.1 million Canadians or one out of every eight jobs – farmers, suppliers, processors, transporters, grocers and restaurant workers – to bring food to tables in Canada and around the world!

Teats and tweets

Did you know… that some dairy cows are active tweeters? That's right – 12 Holstein cows in southern Ontario post their daily activities on Twitter. They're part of a social media project led by the Critical Media Lab at the University of Waterloo that looks at the way humans interact with animals and helps link farmers and technology in the minds of consumers by putting a spotlight on the highly technological nature of farming. The cows live in a robotic milking barn and every time they approach the robot for milking, it reads the cows' electronic identification tag. That tag is connected to a computer that generates tweets for the cows – like "9.2 kg of frothy deliciousness for the humans" or "Tried to get into the pen. No such luck". Learn more or follow the cows on Twitter: www.teattweet.net.

COWS OF MANY COLOURS…

It's a surprise to many people, but cows come in different shapes and sizes or breeds. A poodle is very different than a husky dog, just like a Holstein is different than an Angus!

Dairy breeds tend to have thinner coats of hair and are leaner with less muscling than beef breeds, as they put all their energy into making milk. There are six common dairy breeds: Holstein, Jersey, Ayrshire, Brown Swiss, Guernsey and Milking Shorthorn. Holsteins are the most commonly used breed in Canada and are often the most recognizable with their black and white colouring.

Beef breeds are more muscular and only produce enough milk for one calf each year (or occasionally twins). Major breeds of beef cattle in Canada include Angus, Charolais, Hereford, Simmental, Limousin, Maine-Anjou, Salers, Gelbvieh, and Shorthorn. Some beef farmers raise purebreds, but most have herds consisting of crossbred animals (combinations of more than one breed) to combine the best qualities of each breed.

Cow tipping myth – Busted!

A researcher at the University of British Columbia concluded it would take five people to push a cow over, and that's if the cow was willing to be tipped. Most cows do not sleep standing up and are startled easily by noise and strangers. Now you know!

EVER HEARD OF BULLYING?

Traditionally, milk-fed veal calves have been raised in stalls to provide them with individual care and allow them to drink their milk without the fear of "bullying" from other calves. However, with today's technology, more veal farmers are raising milk-fed calves in group pens, like the one shown on the next page, where the calves drink from an automated milk dispenser (almost like a giant milkshake machine). This allows calves to drink whenever they want and with less competition

The real deal about veal

Veal calves are generally dairy bull calves. They live in one of three housing types: hutches, group pens or individual stalls. Veal housing is well-lit, insulated, and ventilated, protecting them from predators, parasites, and weather. Farmers raise veal calves two ways: by feeding a grain-based or milk-based diet. **Milk-fed veal calves** are raised on a diet that contains all of the essential nutrients for animal health and are sent to market when they weigh about 450 pounds (178 kg). **Grain-fed calves** are fed a milk-based diet for the first six to eight weeks, after which they're gradually introduced to a diet of corn and protein. Grain-fed veal calves grow to be about 700 pounds (275 kg).

One of the biggest misconceptions about veal is that it is meat that comes from a very young and small calf, but 450 – 700 pounds is not small!

To learn more about how veal calves are raised, visit www.ontarioveal.on.ca/pdfs/1467%20InformationBrochure.pdf – and to tour two real veal farms virtually, go to www.virtualfarmtours.ca.

Sheep — can be raised indoors and out. Some are kept out on pasture all year, with the help of supplied hay and grain during winter. Some shepherds prefer to keep their flocks in the barn year-round, to keep a close eye on lambs and keep predators at bay. Most farms use a mix of both systems.

Working farm dogs play an important role on many Canadian sheep farms – protecting animals from predators and helping farmers with herding.

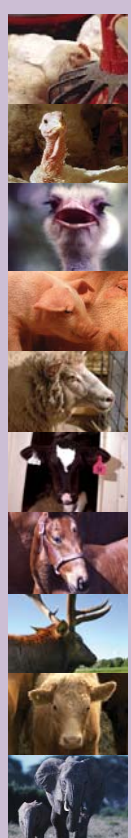
Goats — goats can be raised for meat or to produce milk. Dairy goats are housed and cared for like dairy cows, indoors for the twice-daily milking routine. Other breeds of goats raised for meat may be out on pasture, but need protection from temperature extremes and predators too. One goat will produce about 2.5 litres of milk per day and it takes 10 goats to produce the same amount of milk as one dairy cow.

There are people who have to avoid cows' milk and dairy products in their diets because of allergies or intolerances, so some are turning to goat milk. There are approximately 6,700 goat farms in Canada, of which the largest number is located in Ontario.

(Source www.statcan.gc.ca/pub/23-502-x/23-502-x2007001-eng.pdf

JUST HOW BIG ARE THEY?

We get asked a lot of questions like: How big is a horse? How much do veal calves or pigs weigh when they go to market? Here's a chart of an approximate weight of average males (females weigh a bit less).



- **Chickens – 2.2 kg**
- **Turkeys – 12 kg - 14 kg**
- **Emu – 45 to 50 kg**
- **Pig – 100 kg**
- **Sheep – 70 -125 kg**
- **Veal calf – 320 kg**
- **Quarter Horse – 544 kg**
- **Elk – 420 to 600 kg**
- **Beef cattle – 680 kg**
- **African Elephant –7, 425 kg**

SWEAT LIKE A PIG? NOT LIKELY!

Forget what you've heard. Pigs like to keep clean and they can't sweat to cool off. Barns provide a clean environment and some even have sprinklers to keep pigs cool in the summer.

A STOMACH FOR DRIED GRASS?

Horses are not ruminants, like a cow or deer. However, they do have a special stomach that allows them to thrive on a diet of grasses, hay, oats, corn or barley. If the need arises, they can also exist on dry grass and scrub brush and trees.

Pigs — many live in barns specially designed for pigs, with fans or 'curtain-sided barns' that can open if needed to help control humidity and temperatures. To keep the animals disease-free, most barns have strict sanitation standards and animal health rules. For example, some farms require anyone entering the barn to shower first or wear plastic boots provided by the farm.

Sows are female pigs that usually birth 8–12 piglets in a litter and give birth (farrow) twice a year. Sows are put in special areas called "farrowing pens," just before giving birth and while they nurse their piglets. Some people have criticized farrowing pens (see photo on left) because they restrict the sows' movement. The reason for the pen design is to provide the best environment for both the large sow and the small piglets. The bars on the pen give the sow something to lean against when she lies down, and the piglets have a safe area to stay out of harm's way. The area where the piglets sleep can be kept warm with a heat lamp or heating pad.

Case study: Is this room a pig sty?

How difficult can it be to look after pigs? Movies and storybook images of pigs in the mud make it look pretty simple. In the real world there are rarely easy answers to farm animal care questions. Of course pigs don't talk, they didn't get the memo to be nice to each other and they actually prefer a clean, dry pen over a mud hole.

It's all about tradeoffs - with no easy answers or perfect solutions. For example, in pig housing, we often trade off free pen space for individual pens. Why? Sows are omnivores and can be aggressive animals when they compete for food. Many pig farms choose to house sows in individual stalls.

Pros:

- Pigs can eat and drink individually, with no fighting or stress from competition
- Farmers can care for individual animals, monitoring health and feed intake each day

Cons:

- Sows' movement is restricted. They can only move back and forth and lay down.
- Pigs can't socialize with other animals

There is a reason why we built barns years ago and continue to modify pens to try and work for the animals and the people who work with those animals. Millions of dollars have been invested in pig housing research around the world. For example, Canada's hog farmers, government and agriculture industry have invested over $850,000 in sow housing research at the Prairie Swine Centre in Saskatchewan in the past 10 years. This investment shows the interest, concern and commitment to finding answers on how to improve how we raise animals.

What have we learned with all this research? It's too simplistic to look at just one issue in isolation. There are many factors to be considered, including animal health and welfare, human health and safety, environmental impacts, food safety and economics.

Beyond traditional farm animals

Canada's growing ethnic communities and a desire by consumers for more diverse products is boosting the number of less traditional livestock. The number of bison and llamas, popular in Western Canada, almost tripled from 2001 to 2006. For llamas, the appeal is in their wool, which many consider comparable to cashmere in softness. Half of these animals are in Alberta.

Deer and elk were more likely to be found in Alberta, which had 42,748 head, and Saskatchewan, which had 34,189. Alberta's herd more than tripled between census years. Elk are now more popular than deer. The antler velvet from both animals is also an ingredient in holistic medicines, which are produced in North America for export to Pacific Rim countries.

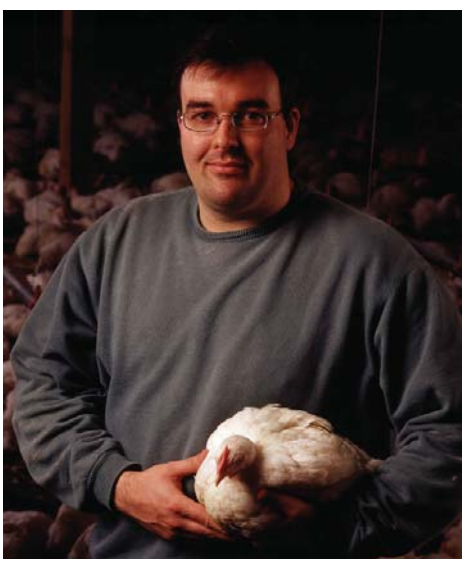
(Source: Statistics Canada).

LOOKING TO THE PAST

Heritage breeds are a growing niche. Some farmers are actively raising and marketing livestock and poultry breeds that were common 50 or 100 years ago, but are no longer used in modern food production. Food products from these animals – like Tamworth and Berkshire pigs – are known for their unique flavours and are prized by chefs and discerning consumers alike. They are mostly sold as specialty products and farmers receive higher prices for them because raising them is a slower, more labour-intensive process than with regular livestock.

ANIMAL WELFARE OR ANIMAL RIGHTS?

Most people believe in **animal welfare** principles: humans have a right to use animals, but also have a responsibility to treat them humanely. Farmers and ranchers live by these principles. By contrast, **animal rights** supporters don't believe humans have a right to use animals — whether it's for food, clothing, entertainment or medical research. It can be confusing for the average person to sort out the many positions and groups involved with animal care or animal use issues. Activists of any kind are not usually interested in finding solutions, but prefer to focus on problems and dramatic examples to generate funds and support.



Farmers are not interested in fighting with activists. They're interested in caring for their animals and figuring out how to do a better job of it. They support animal welfare research that generates real information based on sound science, they continue to improve their practices and hope that public education efforts help shine a light on what they really do—and do not do! If you want to know more about how farmers care for farm animals, please just ask them.

HOLLAND MARSH GROWERS' ASSOCIATION

Let's Talk Crops

FRUITS AND VEGETABLES

Over 120 different fruit and vegetable crops are grown in Canada from coast to coast – but the bulk of Canadian production is found in Ontario, British Columbia, and Quebec. This includes everything from apples, pears, peaches, cherries, blueberries and grapes to ginseng, garlic, onions, carrots, peppers, asparagus, potatoes, cauliflower, cucumbers, cabbage, broccoli and so much more. (Source: www.ats-sea.agr.gc.ca/can/5302-eng.htm#a)

NEW CANADIANS = NEW CROPS

People of Asian heritage make up more than 60 per cent of all of Canada's immigrants today. Chinese and South Asians (India, Pakistan, Bangladesh and Sri Lanka) are now Canada's two largest ethnic communities and it is predicted that they will number close to four million by 2017. New Canadians are actively looking for produce that they are familiar with from their native countries, so some farmers have begun growing crops that aren't traditional for Canadian markets – crops like bok choy, nappa (Chinese cabbage), mustard cabbage, water or Chinese spinach and Chinese broccoli.

Did you know… that carrots come in many colours? Yes, they're not just orange but also grown in varieties that are purple, yellow and white!

Just over half of Canada's vegetable crop is grown for processing – the top five crops are sweet corn, green peas, carrots, beans and tomatoes. Apples, blueberries and grapes make up over 80 per cent of Canada's fruit acreage.

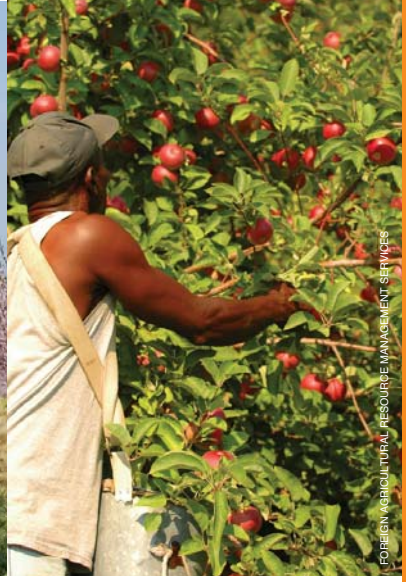
(Source: http://dsp-psd.pwgsc.gc.ca/collections/collection_2010/statcan/22-003-X/22-003-x2010001-eng.pdf)

Greenhouses bloom year-round

More and more of the fresh vegetables and flowers we enjoy in all four seasons are grown in greenhouses. Between 2001 and 2006, greenhouse area in Canada increased by 21 per cent. By 2006, there were approximately 5,600 greenhouse operations in Canada, with more than half located in Ontario. British Columbia and Quebec are ranked second and third. Ontario, with 1,800 acres of greenhouse vegetable production, is the largest greenhouse production sector in all of North America. Vegetable greenhouses grow primarily peppers, cucumbers and tomatoes. The floral sector includes growers of cut flowers, potted plants, bedding plants and/or propagation material. (Source: www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1205766026093&lang=eng)

Water, water everywhere — NOT!

Some high-value and sensitive crops—usually fruits and vegetables— require irrigation. Today's irrigation systems come in a variety of forms, and are made to maximize every drop of water. Water availability and quality are an important issue for all of us. Some land used to grow crops is drained using underground tile to remove surplus water from fields. This improves crop quality and yield and reduces water runoff and erosion. In some provinces, farmers must apply for a government permit to take water to ensure that they are using water resources properly and in an environmentally responsible way.



FOREIGN AGRICULTURAL RESOURCE MANAGEMENT SERVICES

RELIABLE LABOUR

Fruits, vegetables and other horticultural production is very labour-intensive as many crops must be planted and/or harvested by hand. Some crops also have very specific – and often short – planting or harvesting seasons so sometimes a lot of work has to be done very quickly.

The Seasonal Agricultural Worker Program (SAWP) began in 1966 when a group of 264 Jamaican workers arrived in Ontario to harvest apples. Today, the program is available to only five countries, as stipulated in the General Agreement on Tariffs and Trade (GATT). They include Mexico, Jamaica, Trinidad & Tobago, Barbados and the Eastern Caribbean Islands.

SAWP is not to be confused with other similar temporary foreign worker programs available to Canadian employers. Often misunderstood, this long-standing program has developed many friendships, improved the lives of thousands and serves as a viable source of labour for Canadian horticulture.

The SAWP has always remained a Canadians First program. That means that if there is a suitable Canadian for that job, he/she is offered employment. The SAWP also comes with many unique features that set it apart from other temporary foreign worker programs including:

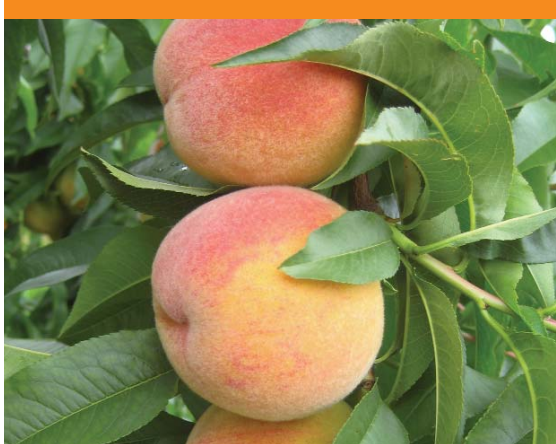
- A formal Memorandum of Understanding exists between the Government of Canada and the governments of each of the five individual source countries.
- Suitable accommodation, at no cost to the worker, must be provided by farm employers.
- Health coverage is available immediately upon arrival.
- Canada Pension Plan and some Employment Insurance benefits, like parental leave, are available on approval to eligible workers.
- Provincial employment standards programs and workers' compensation standards apply, just like for Canadian workers.
- A formal, four-way employment agreement between the employee, employer, foreign government, and government of Canada is in place.
- Same provincial minimum hourly wage rate is paid as it is to Canadian workers doing the same job – and many can earn a much higher rate. In fact, wages they earn working on Canadian farms far exceed what they would be able to earn during the same time in their home countries.

Workers from Mexico have stated that they can earn as much in a three month stay in Canada as in one year in Mexico – that's **IF** they can find a job there. Many families in the Caribbean and Mexico have risen out of poverty because of the money they've been able to earn in Canada and bring back to their home country. A job in Canada can mean being able to build a better house, enjoy better healthcare and sending children to high school, college or university.

About 20,000 workers come to Canada every year as part of the SAWP – the only program of its kind in the world – and more than 85 per cent of workers are requested back annually. Many workers have been with the same farmer for more than 20 or 30 years and now the adult children of many workers are requested to come to Canada to work. Close relationships develop between many workers and the farm families they work for, and many workers also become involved in their adopted communities through volunteering and being part of local service clubs and church groups.

Did you know…that for every seasonal farm worker in Ontario horticulture, 2.1 full-time Canadian jobs are created in the agri-food industry? If Canada had no workers under SAWP, over one half of the Canadian horticulture market would be lost to imports – and many popular but labour-intensive crops could no longer be grown here. (Source: Stevens Associates 2003 - Quest for a Reliable Workforce in the Horticulture Industry).

For more information, visit www.farmsontario.ca.



To everything there's a season

Did you know… we couldn't always get strawberries, grapes and sweet corn at the grocery store all year round? Every crop is ready for harvest – and eating – at a different time of year. Asparagus, for example, is one of the earliest vegetable crops, usually available by May. Summer means cherries, peaches, garlic and potatoes and fall brings apples, pumpkins, squash, carrots, onions and much more.

A berry long season!

Did you know… that you can get fresh strawberries and raspberries outside the traditional picking season? Traditionally, strawberry season has lasted only a few weeks in the spring, usually in June. Berry farms are now growing day-neutral (ever-bearing) strawberries and fall bearing raspberries which means we can now get locally grown fruit from May until about the end of October.

Krause Farms of British Columbia, for example, have perfected the art and science of growing these new berries. They plant on raised, plastic covered beds and deliver water and nutrients to the crop through a drip irrigation system. Some farmers are also producing these varieties in greenhouses which can result in harvest in May, a month earlier than the traditional strawberry season.

Honey bees play a critical role in the production of fruits, vegetables and other crops – they pollinate blossoms on the plants to turn them into fruits (like apples for example) or vegetables (like pumpkins). In fact, it's estimated that every third bite of food we eat relates back to honeybees and pollination! Canada produces about 75 million pounds of honey every year.

The centre of every beehive is the queen bee, surrounded by a cluster of worker bees tending to her every whim. Many queens in Canada come from Hawaii – travelling to their new home at one to two months of age in a little match-box sized cage with five attendant bees to feed her from a little candy plug at the end of the box that provides nutrition while they're in transit.

CORN, WHEAT, SOYBEANS, CANOLA AND PULSES

Canada's principal grain and oilseed crops are corn, wheat, soybeans and canola. Corn and wheat are widely grown across the country. Soybeans are found mostly in Ontario, Quebec and Manitoba while canola is grown principally in Western Canada.

Canola was developed in large part by Agriculture and Agri-Food Canada scientists and is now the oil of choice for millions around the world because of its nutritional attributes? Canola oil is free of trans fat and has the least saturated fat and the most omega-3 fatty acids (ALA) of all common cooking oils. This year, Canadian farmers will grow 1.5 million acres of specialty canola in Western Canada that will be made into stable, trans fat free oil for McDonald's Restaurants.

Did you know… that 100 acres of soybeans can produce enough soy beverages for half a million people.

Canada is the world's largest exporter of pulses – not the human kind, but beans, peas, chickpeas and lentils. Pulse crops contain nutrients found in both the vegetable and meat food groups, including significant protein, fiber, folate, iron and other minerals.

The doomsday seed bank

Norway has built a seed vault deep in its Arctic region to preserve a wide variety of plant seeds. They are duplicate samples, or "spare" copies, of seeds held in gene banks worldwide and are being stored in this safe place in case of large scale regional or global crises that might threaten food production.

THE IRISH POTATO FAMINE: A CAUTIONARY TALE

In 1845, a strange disease struck the potatoes growing in the fields of Ireland. Almost half of the crop was destroyed. What later became known as potato blight was caused by a fungus. At that time all farming was "organic," and there was nothing to be done to save the essential food crop. Today, potato blight can be prevented by modern fungicides which greatly decrease the crop's vulnerability to massive losses. This is a clear case where modern agricultural practices increase the reliability and security of our food supply.

Satellites running farm equipment

Many farmers today rely on precision agriculture through satellite-controlled guidance of Global Positioning Systems (GPS) on their tractors and equipment to manage their field work, including planting, nutrient and crop protection application and harvesting. It helps reduce fuel consumption, and helps farmers ensure more efficient use of nutrients, seeds and crop protection products.

If only farmers could control the weather!

Actually, some of them can…sort of. Damaging weather can mean the difference between a good year and a bad one on the farm, especially for fruit growers. Hail is a big threat, but some farmers believe a hail cannon can keep fruit safe from damage. Here's how it works: A hailstone is made up of a positive and a negative ion, a dust particle and the right atmospheric conditions. The cannon shoots sound waves into the air, which pick up positive ions and break up the hailstones. The cannon can be activated by a pager whenever the threat of hail approaches. Timing is everything – if you wait too long, it's too late to ward off the hail. And while its benefits are great for consumers and farmers, the downside is the noise it creates. When it's working, it sounds every six seconds.

So Much More Than Food!

WHERE'S AGRICULTURE? EVERYWHERE!

Most people think of farming for food. But the by-products of food animals are used far and wide. Check out our list of weird stuff from the farm – as you can see, it's in all aspects of our daily lives.

In the home...

- Bone china (Royal Doulton)
- Cellophane (gift wrap)
- Matches (Red Bird)
- Soy crayons (Prang)
- Violin
- Printer ink cartridge (Brother)
- Glass cleaner (Green Works)
- Soy candles (Decora)

At work...

- Dynamite
- Biodegradable plastics
  - Corn-based travel mug
  - Corn-based ruler
  - Corn-based picnic cutlery
  - Corn-based clear drink cups
  - Glad compostable bags

While driving...

- Performance tires (Ultra HPR)
- Spark plugs (Motomaster)
- Anti-freeze (Prestone)
- Brake fluid (Prestone)
- Armor-All wipes
- Asphalt sealant
- Lubricants and engine oils

In our diets...

- Gummy bears
- Canadian Club whiskey
- Licorice (Twizzlers)
- Trident White chewing gum

At the pharmacy...

- Intravenous solution
- MediHoney wound dressings
- Thentix Skin Conditioner.
- Eye drops (Visine Plus)
- Gelatin pill casings (Advil liquid gels)

In the bathroom cabinet...

- Toothpaste (Crest Expressions)
- Cosmetics
  - Cover Girl Mascara
  - Cover Girl Foundation
  - Cover Girl Makeup remover
  - Oil of Olay eye regenerating cream
  - Lipstick (Elizabeth Arden)
- Lip balm
  - Yes To Carrots™ lip butter
  - Burt's Bees with pure beeswax
- Mouthwash (Scope)
- Purell Hand sanitizer
- Shaving cream (Gillette)
- Vanilla fragrances (Vanilla body spray, Body Shop)
- Shampoo (Pantene Pro V)

While we're having fun...

- Paintballs (Heavy Metal)
- Fireworks (Cutaway model)
- Sport equipment (Pig skin football)

For more info, see **www.wheresagriculture.ca**

Did you know... that of 10,000 items in a typical grocery store, at least 2,500 of them use corn in some form during production or processing?

A HOUSE MADE OF SOY

Believe it or not – it's possible to live in a house built from soy. Ok, so it's not a house built from actual soybeans, but many soy-based products were used to construct and decorate a 1200 sq ft house displayed at the Royal Agricultural Winter Fair in Toronto in 2009. Everything from paints and varnishes, adhesives, household insulation, kitchen cabinets, carpet backing, bathroom fixtures, sofas, mattresses, bedding, clothing, food, candles, soaps, and cosmetics, featured soy. Soy oil can be used as an environmentally-friendly, sustainable replacement to petroleum oil in many household products. After the show was over, the house became a Habitat for Humanity home.

CANADA AT SOCCER'S WORLD CUP

No, Canada didn't qualify to send a team to the 2010 World Cup of Soccer in South Africa, but we still played a key role in the tournament. The world's best were playing on fields sown with ryegrass seeds that a Canadian company grew in Manitoba. They developed the special grass blend – 85 per cent perennial ryegrass and 15 per cent Kentucky bluegrass – for the South African stadiums and practice pitches, supplying 165,000 pounds of seed. The World Cup is the largest sporting event in the world, attracting a cumulative global audience of 26 billion people.

PLANTS FOR ENERGY

Our society depends heavily on natural gases, petroleum and other non-renewable resources for energy. Some farmers are now starting to experiment with growing crops specifically to make energy – like heat for our homes and for greenhouses where flowers and vegetables are grown. The main species being looked at are switchgrass and miscanthus, two types of grass. These crops are called energy crops, bio-energy crops and biomass.

Did you know…that Indy cars in an Edmonton, Alberta race in 2009 used 100 per cent ethanol fuel? That's 380 km per hour with a green, renewable fuel!

Biodiesel helps fuel the future

Biodiesel is a similar clean-burning alternative fuel produced from renewable resources, like animal fats and plant oils. Current biodiesel markets are in mass transit, marine transportation and other sensitive areas such as mines.

Animal fat may someday come to your local gas stations. Biodiesel made from animal fat or tallow has a positive energy balance (meaning it contains more energy than it takes to make), emits almost no sulphur, and unlike petroleum, is a renewable fuel. Look to your farmers for this and other innovative, green energy sources in the future.

Good ideas have roots

Ethanol is a renewable fuel made from plants. Ethanol made an early debut as a renewable fuel back when Henry Ford designed the Model T but gasoline outpaced it because it was easier to use in engines and the supply was cheap and plentiful. Today, ethanol is fast gaining on its old rival, as consumers want cleaner fuels for the environment and human health.

Ethanol is being added to gasoline. In Ontario alone, implementing a five per cent blend of ethanol in gas is creating a market for 50 million bushels of corn annually and reducing greenhouse gas emissions by the equivalent of 200,000 cars.

Green energy math

- Charlottetown to Vancouver 5,718 km
- 4,000 kg of corn per acre (Ontario, 2008)
- 2.5 kg corn = 1 litre ethanol
- 9.5 litres per 100 km
  = 540 litres
  = 1350 kg of corn

This grows on 1/3 of an acre which is only 1/4 of a Canadian football field.

Bonus marks: Ethanol is a form of renewable energy and emits less carbon dioxide than gasoline.

Fun fact: Researchers at the University of Manitoba are using used Tim Horton's cups to make biofuel, like ethanol. Perhaps one day soon Tim's can be "fuelling" both people and cars!

Ford and the magic bean

Even before biodiesel, soybeans had an important role in the automotive industry. In 1935, Henry Ford used 75,000 acres of soybeans in manufacturing and as a binder in his foundries.

From this evolved the notion of using the protein from soybeans as a basis for one of the new miracle plastics just being developed. Protein from soybean meal plus phenol and formaldehyde produced a plastic compound that found its way into gear shifts, knobs, horn buttons, electrical switch assemblies and distributor cases for the Ford cars in the late 1930s.

Today, 21st century car makers are again turning to plants like corn, switchgrass and soybeans for making car parts. They're cheaper and often stronger than plastics made from petroleum - and more environmentally friendly to boot! Foam made from soybeans can be found in the seats of nine different Ford vehicles and the Ford Flex uses plastic trays made from switchgrass.

Environmentally-friendly engine oils and lubricants are now being made – and used by a growing number of Canadian municipalities and businesses – out of soybean and canola oils.

Quick fact: One bushel of soybeans produces about 1.5 gallons of biodiesel. For more info, see www.greenfuels.org.

ENVIRONMENTAL FARM PLANS

In all provinces across Canada, a voluntary program called the Environmental Farm Plan is helping farmers audit their operations for environmental concerns and set goals and timetables for improvements. In Prince Edward Island, for example, 85 per cent of farmers have completed an Environmental Farm Plan. And in Ontario, about 70 per cent of farmers have participated and have invested over $600 million in on-farm environmental improvements over the last 20 years.

It's a program that's being actively copied and adapted in other provinces and around the world, truly making a positive difference for the environment and for the families who live on the farm.

Farmers: The Active Environmentalists

WAS FARMING ONCE MORE ENVIRONMENTALLY FRIENDLY?

A common misconception is that early agriculture functioned in harmony with nature, and that environmental degradation is a phenomenon of "modern" farming. Historical records reveal a different story.

For example, the farming systems adopted by settlers prior to 1850 was wheat monoculture coupled with biennial summer fallow—meaning the production of one crop every second year, with the soil being intensively cultivated but not cropped during alternate years. This system was wasteful of land and ruined soil health and organic matter levels.

Many of the early methods of crop protection involved either excessive tillage or inorganic chemicals, such as sulphur, mercury, and arsenic compounds. Many of these older chemicals are no longer used because of their toxicity or inability to be broken down in the environment.

Between the 1960s and 1980s, monoculture corn was common, leading to pest problems and soil degradation in many areas.

Today, we're learning from our past shortcomings. Crop rotation is the norm, we're much better at looking after our soil's health and crop protection products are safer and highly regulated.

As farmers with families whose livelihood and way of life are very close to the land, we understand more than most the importance of healthy soil, water and air. We live on our farms with our families and depend on the environment to create a healthy place to live, as well as the right conditions to grow crops and raise livestock.

Through farm groups, we invest in environmental research and help develop programs to disseminate the latest findings to our members. In fact, Canada is a world leader in on-farm environmental programs.

ANIMAL AGRICULTURE AND OUR ENVIRONMENT

Is it wasteful to use grain to feed animals? The notion that farm animals in Canada use food needed by people in developing countries is simply false. Livestock don't compete with people for food grains. For example, currently only about 10 per cent of corn grown ends up in consumer foods.

In countries without excess grain supplies, animal feed tends to consist mostly of grasses and forages or other suitable feeds. Farm animals generally receive feed corn or barley, while humans eat mainly wheat and rice. Animals can consume grass, pest or weather-damaged grains, crop residues like corn stalks, leaves and straw, and by-products from food processing such as unusable grains (or parts of grains) left over from the production of things like breakfast cereal. And of course, Mother Nature can be tough, so even some grains intended for humans are sometimes damaged by insects or weather and can only be eaten by animals.

Canada typically produces approximately 50 million tons of grain (wheat, barley, corn, oats, rye) annually, and exports about half of it. High-quality grains used in pasta, bread and other baked goods are not used in livestock feed or in ethanol production.

(Source: www.greenfuels.org/uploads/documents/ethanol%20fact%20sheet%20-%20website.pdf)

Hunger today is generally the result of political, economic, and distribution problems, not the lack of productive capacity. Globally, more food per person is available than ever before.

What's the dirt on dirt?

Soil is made of three things: sand, silt and clay. On their own, each has its benefits and challenges, but when mixed together, they create a perfect growing environment for plants. The texture of the soil, how it looks and feels, depends upon the amount of each one in that particular soil.

Sand – what you'd find on the beach
Silt – what you'd find beside a river
Clay – what you'd find at the bottom of a valley
Loam – the perfect mixture of sand, silt and clay – ideal for growing crops!

The colour of soil tells us a lot about it, like where it comes from, how old it is and what's in it.

Did you know...animal feed manufacturing plays a key role in recycling? For example, the ethanol industry uses corn as its main ingredient. During the ethanol production process, starch is removed from corn, leaving behind a left over product called dried distillers' grain that has increased concentrations of other nutrients, such as fiber, protein, fat and minerals. It has been found to be an excellent feed ingredient, and feed manufacturers are now using it in pig and cattle diets. Many soybeans are grown primarily for their oils – but once the beans are crushed, the empty shells left behind (an excellent source of protein) are ground into soybean meal and fed to livestock.

Does manure contaminate water?

If manure isn't managed properly, it could contaminate water, but farmers are tackling the topic head-on.

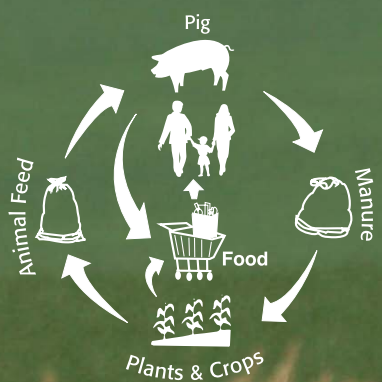
Nutrient management planning—which covers manure, commercial fertilizers, and all other nutrient sources for farm land —is a means of maximizing the benefits of nutrients while ensuring environmental protection. Here's how we're doing it:

- **Soil and manure testing** – by knowing exactly what nutrients we already have and what's needed and when, we apply only what the soil or specific crop can absorb and use.
- **Calibrating (or adjusting) manure and fertilizer spreaders** – so that we know exactly how much we're applying and that we're applying it correctly.
- **Managing stored manure** – ensuring we have the best system(s) for storing and handling manure on our farms.
- **Locating new farm facilities** – so that they are sufficiently far from natural resources and neighbours (determined by number and type of livestock and other factors).
- **Contingency planning** – so that we're ready to respond swiftly and effectively in case of emergency.

LIVESTOCK: THE ORIGINAL RECYCLERS

About 30 per cent of Canada's agricultural land is too hilly, rocky, cold or wet to grow crops. But it can support grazing livestock. Livestock don't compete with people for food grains. In all, about 80 per cent of the feed consumed by cattle, sheep, goats and horses could not be eaten or digested by humans.

Animals convert low-energy and otherwise indigestible plant matter into nutrient and protein rich food, while returning organic matter (manure) to the soil. It's the original recycling program.



So what about the smell?

There's nothing like the smell of manure to come between farmers and our non-farming neighbours. It's a fact of life in farming - one that's not going to go away altogether anytime soon. Odour can waft out of barns and storages, but is most pungent a few times a year when manure is being spread on fields as a natural fertilizer.

We've already learned a lot about odour-reduction through research and innovation, but one of the best tools is called common courtesy. Many farmers let their neighbours know in advance of manure spreading to ensure we're not going to affect their plans. In return, we ask that they understand a bit about our farm and appreciate that some level of odour is inevitable.

Good For Water, Good for Wildlife, Good for Society

An obvious way of keeping manure out of water is restricting livestock access to waterways. In P.E.I., this is the law. To protect stream banks and water quality, farmers' groups actively promote the creation and maintenance of "buffer" zones around water bodies on private property.

What's a buffer zone?

A buffer zone is an undeveloped grassy area directly adjacent to a body of water like a stream. These buffers (aka "riparian" areas) have a multitude of benefits:

- reduced soil erosion from livestock hooves
- cooler water temperatures (afforded by increased shade) that attract desirable fish species
- increased biodiversity through rich and varied streamside habitats
- and much more!

Cattle, sheep and goat producers are also rotating grazing areas and providing alternative water sources, such as using solar powered pumps to provide water for livestock away from a stream.

Farmers are stewards of the land who know the value of protecting soil and water quality. And they continue to invest time and money to do so.

POOP POWER ON THE GRID

Several dairy farms are generating electricity from the manure their cows produce through a process known as anaerobic digestion. This involves the decomposition of organic matter such as livestock manure, plant material and food processing waste, in an oxygen-free environment to produce a methane-rich-gas (biogas). Biogas is a renewable gas that can produce heat, electricity or be upgraded to a natural gas substitute. The by-products of anaerobic digestion can be put on the land as fertilizer or used for animal bedding.

WHAT ABOUT GREENHOUSE GAS?

I've heard farming contributes to greenhouse gas. What are farmers doing about that? Yes, agriculture is part of the problem. But we are also an important part of the solution.

Scientists estimate agriculture produces 10 per cent of Canada's greenhouse gas emissions. Methane, coming largely from livestock, accounts for one-third of agriculture's emissions and nitrous oxide, which accounts for most of the rest, comes from farm soils, especially those that have used manures and fertilizers.

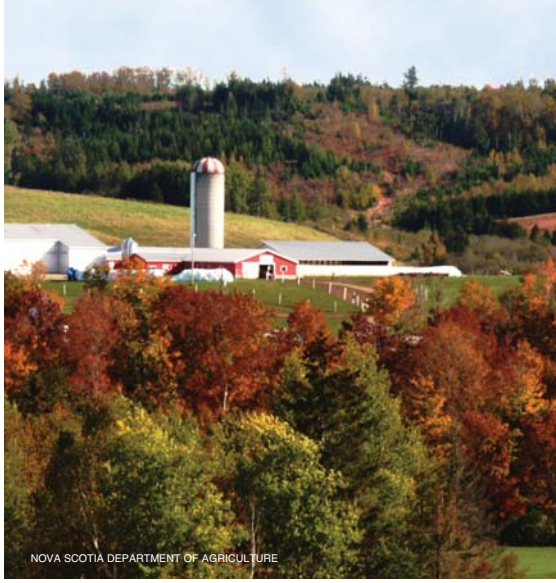
A third and most societally significant greenhouse gas, carbon dioxide, is something that agriculture doesn't produce much of, but which agriculture can help limit. Carbon dioxide can be stored by soils and crops. For example, 100 bushels of corn takes six to seven tons of carbon dioxide from the atmosphere and returns nearly five tons of oxygen. Canada's corn crop alone generates enough oxygen for all Canadians year in and year out.

"Some of our land has been in the family for three generations. It's our job to leave the farm in better shape than it was when we took over, for all of our children. Canadian farmers are more environmentally aware now than in the past – as our farm has grown, so has our investment in the environment."

Brent Robinson, *hog farmer*

A recent study by researchers at Stanford University shows that advances in high tech farming over the last several decades have slowed the pace of global warming by preventing the equivalent of 590 billion metric tons of carbon dioxide from entering the atmosphere. Being able to produce more food on our existing land means we're not converting forests and other land into cropping - a process that typically involves the destruction of trees and other plants, which generates carbon dioxide and other greenhouse gases. Without our technological advances, experts estimate we would need several billion additional acres of cropland, something Planet Earth just doesn't have.

According to a leading researcher into farming and greenhouse gas emissions at University of California – Davis, consuming less meat and dairy is not the way to halt climate change. Real change stems from using fewer non-renewable resources, like oil and coal, for electricity, heating and vehicle fuels. And farmers are leading the way in developing our new global "green economy"!


NOVA SCOTIA DEPARTMENT OF AGRICULTURE

It's not earth-shattering!

On the frontline of weather conditions, farmers are the first to experience and adapt to changing conditions. Persistent dry conditions in the Prairies, for example, have inspired significant shifts in preferred tillage methods.

Tillage is an age-old practice and refers to plowing or working up the soil, something that's done mostly to control weeds. Many farmers in Canada have adopted "conservation tillage" or "no-till" practices. This means crops are grown with minimal or no cultivation of the soil. Any plant materials remaining from the previous year's crop, like corn stubble, is left on the soil, building up its organic matter. In addition, populations of beneficial insects are maintained, soil and nutrients are less likely to be lost from the field and less time, labour and fuel are spent preparing the field for planting, thus reducing our greenhouse gas emissions.

Between 1991 and 2001, use of these environmental practices jumped from 27 per cent to 63 per cent. The reduction in greenhouse gas emissions generated by these practices is equal to taking 125,000 cars off the road!

Grains, grass and cattle

Many people naturally assume that beef cattle raised on grass will have less impact on the environment than feedlot cattle that are transitioned to a grain-based diet after eating grasses for the majority of their lives. But a new study by researchers in Australia actually found the opposite: grass-fed cattle produce more greenhouse gases per pound than beef from feedlot-finished animals. Scientists from the University of New South Wales Water Research Centre say this is because cattle can more easily digest a grain-based diet, which means they produce less methane – about 38 per cent less in this particular study. As well, feedlot animals gain weight faster and are sent to market sooner, which means they're emitting less gas overall. (Source: www.news.discovery.com/earth/grass-fed-beef-grain.html)

ALBERTA BEEF

Did you know...

one acre of corn removes about eight tons of carbon dioxide from the air in a growing season?

(Source: United States Department of Agriculture).

WILDLIFE HABITAT – NOT JUST IN PARKS

More than 30 per cent of Canada's 68 million hectares classified as agricultural land isn't suitable for planting crops (i.e. too rocky, hilly, wet or dry). Often these areas are put to use as pasture for grazing livestock but many do double-duty as excellent wildlife habitat. Many farmers choose practices such as native grass seeding, rotational grazing, and buffer zones around water bodies that sustain wildlife populations and promote biodiversity.

Did you know... that greenhouse gas is not actually gas coming from a greenhouse? It's a series of gases like methane and carbon dioxide, which act as a shield that traps heat in the earth's atmosphere – much like the way a greenhouse retains heat. This is thought to contribute to global warming.

PROTECTING OUR BIODIVERSITY

Canadian beef farmers own and manage about 30 per cent of Canada's agricultural land as grass pasture. Overgrazing can cause erosion and a decrease in the amount of native plant species, so beef farmers have made biodiversity and habitat conservation a major priority.

CANADIAN CATTLEMEN'S ASSOCIATION

Every year, the Canadian Cattlemen's Association presents The Environmental Stewardship Award (TESA) to a beef farmer who has gone above and beyond standard industry conservation practices. The 2009 winner was the Madley family's Canyon Ranch in British Columbia, a fifth generation family ranch. Extensive fencing maintains and protects riparian areas. Installation of water troughs and fencing on a nearby creek protects breeding habitats for curlew and other upland bird species. Cattle holding pens are set back from the creek to establish a buffer zone that protects it from nutrient and bacterial runoff and groundwater springs and the creek's side channels were fenced to protect habitat for salmon fingerlings.

Food and light from our garbage

In British Columbia, a greenhouse is using Vancouver's garbage to grow vegetables and generate enough electricity to light 6,700 homes. At the same time, it is reducing carbon dioxide emissions by 40,000 tons per year. Methane gas from the landfill is piped over to the greenhouse where it is used to generate electricity and heat. The heat is used to grow vegetables.

True or false:

PESTICIDE USE CAN HELP PROTECT WILDLIFE

True. Sounds crazy? Think again. The biggest threat to wildlife is loss of habitat.

Pesticides help farmers produce more food without increasing the area of cultivated land. The products are precise, safe, and stringently controlled. Scientific surveys show that pesticide residues in foods are 100 to 1,000 times lower in Canada than levels considered safe by the World Health Organization (www.pestfacts.org).

PLASTIC GETS A NUDGE

Animal and plant-based products, unlike many synthetic materials, biodegrade quickly. Adding food byproducts to things like plastic can speed up the break-down process.

GOODBYE MONOTONOUS MONOCULTURE

Variety is the spice of life. Farmers grow a variety of crops every year, and avoid planting the same crop on the same field year after year. Crop rotation discourages pest populations from building up, and is great for soil health. On Prince Edward Island, it is now mandatory to have a three-year crop rotation on all farms. The common rotation is potatoes, grains (like wheat or barley) and forages.

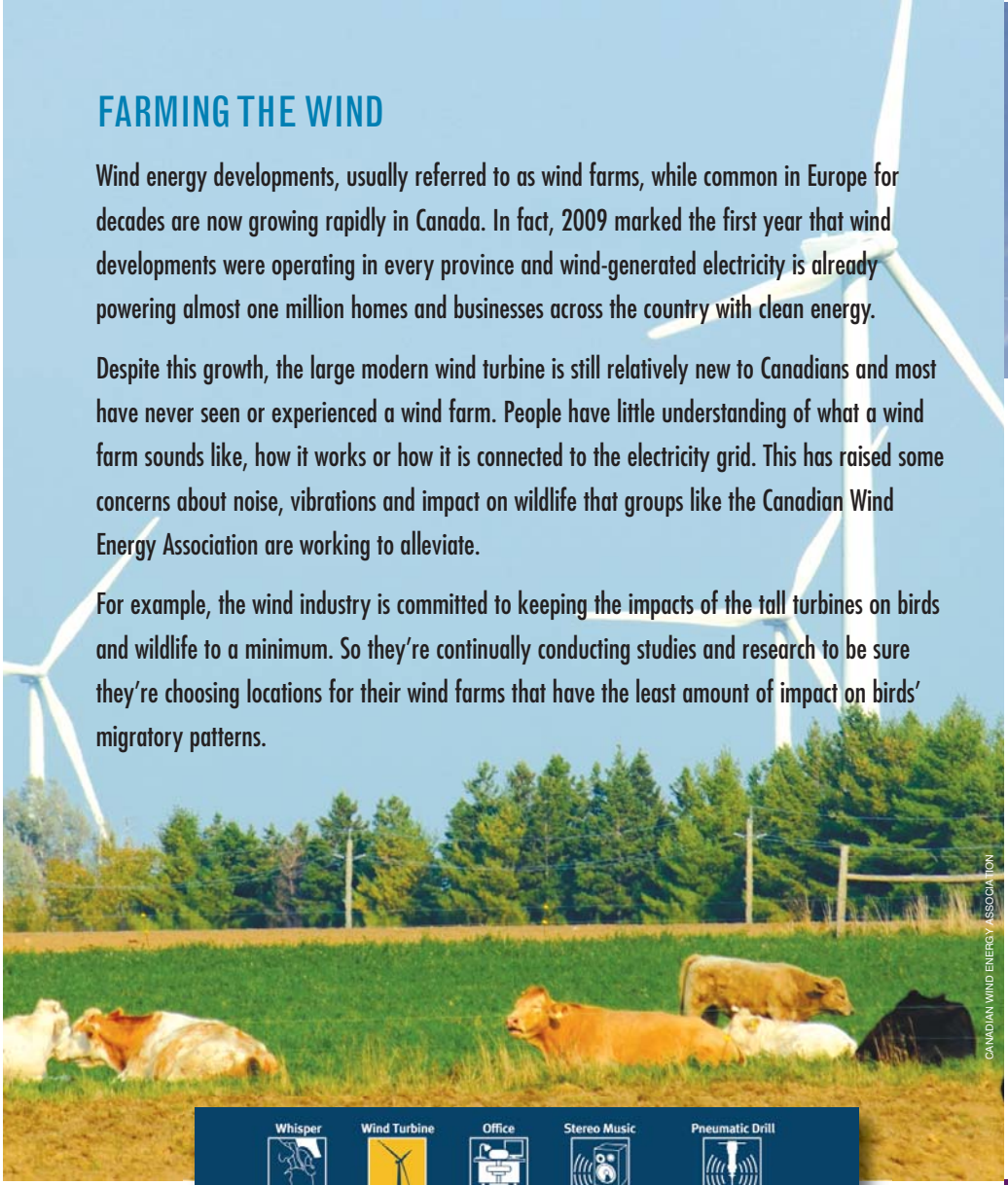
CARLA BUCHANAN

FARMING THE WIND

Wind energy developments, usually referred to as wind farms, while common in Europe for decades are now growing rapidly in Canada. In fact, 2009 marked the first year that wind developments were operating in every province and wind-generated electricity is already powering almost one million homes and businesses across the country with clean energy.

Despite this growth, the large modern wind turbine is still relatively new to Canadians and most have never seen or experienced a wind farm. People have little understanding of what a wind farm sounds like, how it works or how it is connected to the electricity grid. This has raised some concerns about noise, vibrations and impact on wildlife that groups like the Canadian Wind Energy Association are working to alleviate.

For example, the wind industry is committed to keeping the impacts of the tall turbines on birds and wildlife to a minimum. So they're continually conducting studies and research to be sure they're choosing locations for their wind farms that have the least amount of impact on birds' migratory patterns.



Quick wind facts:

- One third of all wind farms in Canada are in Ontario.
- A modern wind turbine is 80 metres high.
- Close to two per cent of Canada's electricity is now produced by wind.
- Canada is aiming for 20 per cent of its electricity produced by wind by the year 2025 – which means 52,000 full time jobs mostly in rural areas!
- In general, the entire wind farm (including tower, substation and access roads) use only about five per cent of their allotted land.
- 86 per cent of Ontarians would like to see their municipal government encourage and facilitate wind energy development.

For more information on wind energy, visit www.canwea.ca.

HARVESTING THE SUN

We're all becoming more energy conscious and looking for ways to lower our costs and reduce our environmental footprint. Farmers are turning to the sun and the wind as sources of energy, installing solar panels and wind turbines on their farms. Some use the electricity in their homes and farm buildings; others sell the electricity they generate into the grid to power homes, offices and factories in Canada's cities.

In Ontario, solar panels have been installed on five barn roofs at the second largest cattle operation in the province. The 675 kilowatt system will produce enough energy to power 67 average Canadian homes or to light more than 45,000 average-sized compact fluorescent light bulbs.

Did you know… that a wind turbine actually makes less noise than the average "buzz" in an office or the sounds in a typical household? And the average volume of stereo music is about twice as loud as a large wind turbine!

In addition to providing us with clean, green energy, wind farms also bring new skilled, well-paying jobs into rural areas. And the extra income from a wind turbine can sometimes make the difference between a family being able to keep or having to sell their farm.

Opinion poll research by Ipsos Reid has shown that Canadians overwhelmingly support wind energy for its environmental benefits, its support of farmers, jobs and rural infrastructure.

The Role of Science in Producing our Food

WHAT IS BIOTECHNOLOGY?

Biotechnology involves bringing desirable traits from organisms and biological substances to another. Bread, beer and wine, which are produced with the help of yeast, are early versions of this science. More recently vaccines, antibiotics, and other medicines have been produced using biological agents.

When biotechnology is applied to food, the goal is to influence biological processes in ways that increase the supply, consistency, durability and quality of the plant and animal products we use.

A BRAVE NEW WORLD – OR A BETTER ONE?

Most of the spectacular gains in agricultural productivity in the past century had their origins in a laboratory. Plant and animal genetics, soil management, pest and disease management strategies, feeds and animal housing, even weather forecasting—every aspect of farming has benefited.

Society has been the winner too, as more nutritious, more abundant, more reliable and less expensive food is produced using less farmland.

Many of these technologies, such as commercial fertilizers, are reaching their limits. More and different advances will be needed to keep moving forward.

For some people, scientific progress is a mixed blessing. Words like biotechnology and genetic engineering can strike fear. Let's take a closer look.

One thing is certain: if we are to feed growing human populations while preventing damage to ecosystems and natural processes upon which all life depends, agriculture must continue to make advances.

Some types of corn have been modified to protect it from devastating insects, (like this European corn borer) without the need for insecticides. For more info, see www.agcare.org

USDA

WHAT IS GENETIC ENGINEERING?

Genetic engineering (GE) is a form of biotechnology. It refers to the precise alteration of an organism's genetic makeup by adding or removing specific genes. The result is a "genetically modified organism" or GMO.

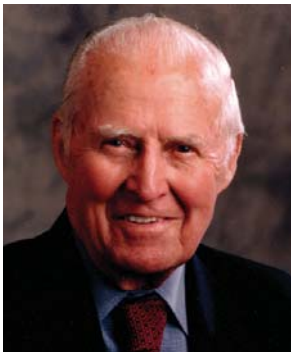
For some farmers, GMO crops provide another option to pesticides for managing infestations. They can reduce pesticide use — good for the environment and the bottom line. Herbicide-tolerant canola has taken the market by storm: over 70 per cent of all canola planted in Canada is from GMO varieties. Herbicide- tolerant plants are not killed by certain types of herbicides, and therefore the farmer can apply the herbicide to the crop to control weeds, without killing the crop.

Plant biotechnology will mean that crops will be grown for their value as "functional" foods or neutraceuticals—appearing in vaccines and nutritional compounds to prevent or treat disease. Croplands could be the new pharmacies.

For consumers, benefits like "herbicide resistance" may be hard to appreciate, but upping the wellness quotient is another matter. Here's a sampling of possibilities:

- Tomatoes that contain more lycopene, an antioxidant that reduces the risk of prostate cancer
- Nuts without sometimes deadly (to some) allergenic proteins
- Tobacco plants (yes!) to produce therapies to fight Crohn's disease
- Crops that grow in saline soils or that grow better in drought conditions—think cold-tolerant grape stock to extend the range of grape-growing areas.

The man who saved a billion lives



After World War II, failing harvests, famine and extreme poverty were haunting the Indian sub-continent – countries we know today as India, Pakistan, Bangladesh and others – as well as other parts of the world.

Dr. Norman Borlaug grew up on a farm in Iowa never knowing hunger. In 1933, he took a trip to Minneapolis and witnessed riots over food and milk. He realized that peace within a human population could not occur until the population was no longer hungry. He became a visionary plant breeder, developing new wheat varieties that were rust-resistant, strong and high yielding and that could be adapted to the local environment.

Together with the introduction of new fertilizer and irrigation techniques, Borlaug helped increase crop yields in Pakistan and India fourfold and helped those countries be able to grow enough food to feed their populations in an amazingly short time. This earned him the title of Father of the Green Revolution. His work was adapted for other crops, such as rice, and eventually went around the world, saving an estimated one billion lives. He founded the World Food Prize and received the Nobel Peace Prize in 1970 in recognition of his work in India and Pakistan. (Source: www.worldfoodprize.org/index.cfm?nodeID=25305&audienceID=1#green)

In closing...

In agriculture, we can all look back with some fondness at the days when we carried feed and water to our animals by hand and used horses to plow our fields. Our crops were planted with a hope and a prayer on the weather and the seed quality, with best guesstimates from the neighbours on how much fertilizer or manure we needed to apply.

Fast-forward to today. New technology continues to accelerate change from farm to field to table. We are going further and faster than most ever thought possible. We can use global positioning systems (GPS) to beam precise information on the state of our land in each one of our fields. This level of detail helps us to apply fertilizers and other inputs only if needed, and only where they're needed—good for the environment, and good for the bottom line. From outer space to our fields, the farm office and ultimately all of our dinner tables—what's next?

Some of the most important things haven't changed a bit. The ultimate success of Canadian agriculture rests on the commitment of farm families to their land, to their animals, and to this special way of life. And don't forget, Mother Nature is still a tough boss.

Ultimately we all want the same thing: a food supply that is reliable, affordable, safe, nutritious and responsibly produced. We live in a country that is blessed with more food choices than most. It's a matter of choice—choice by you as a consumer in what you want to buy, and for the individual farmer as to what to grow and how.

Thank you from all of us for buying products from Canadian farmers. We realize this support is a two-way street. As farmers, we feed people who live in cities but we, in turn, also need the support of those cities to survive. By buying local, you invest in us. We, in turn, invest in improving our environment, raising standards for animal care and providing safe, high quality food.

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PROJECT CHAMPIONS

AFAC Alberta Farm Animal Care — www.afac.ab.ca

ASA American Soybean Association International Marketing — www.asaim.org

USB United Soybean Board, Making Your Checkoff Pay Off. — www.beefinfo.org

Beef Information Centre — www.beefinfo.org

cahi icsa Canadian Animal Health Institute / Institut canadien de la santé animale — www.cahi-icsa.ca

canwea Canadian Wind Energy Association / Association canadienne de l'énergie éolienne — www.canwea.ca

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fcc Farm Credit Canada / Canada — www.fcc-fac.ca

F.A.R.M.S Foreign Agricultural Resource Management Services — www.farmsontario.ca

Grain Farmers of Ontario — www.gfo.ca

OFA Ontario Federation of Agriculture — www.ofa.on.ca

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F.A.C.S Farm Animal Council of Saskatchewan Inc. — www.facs.sk.ca

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OFAC Ontario Farm Animal Council

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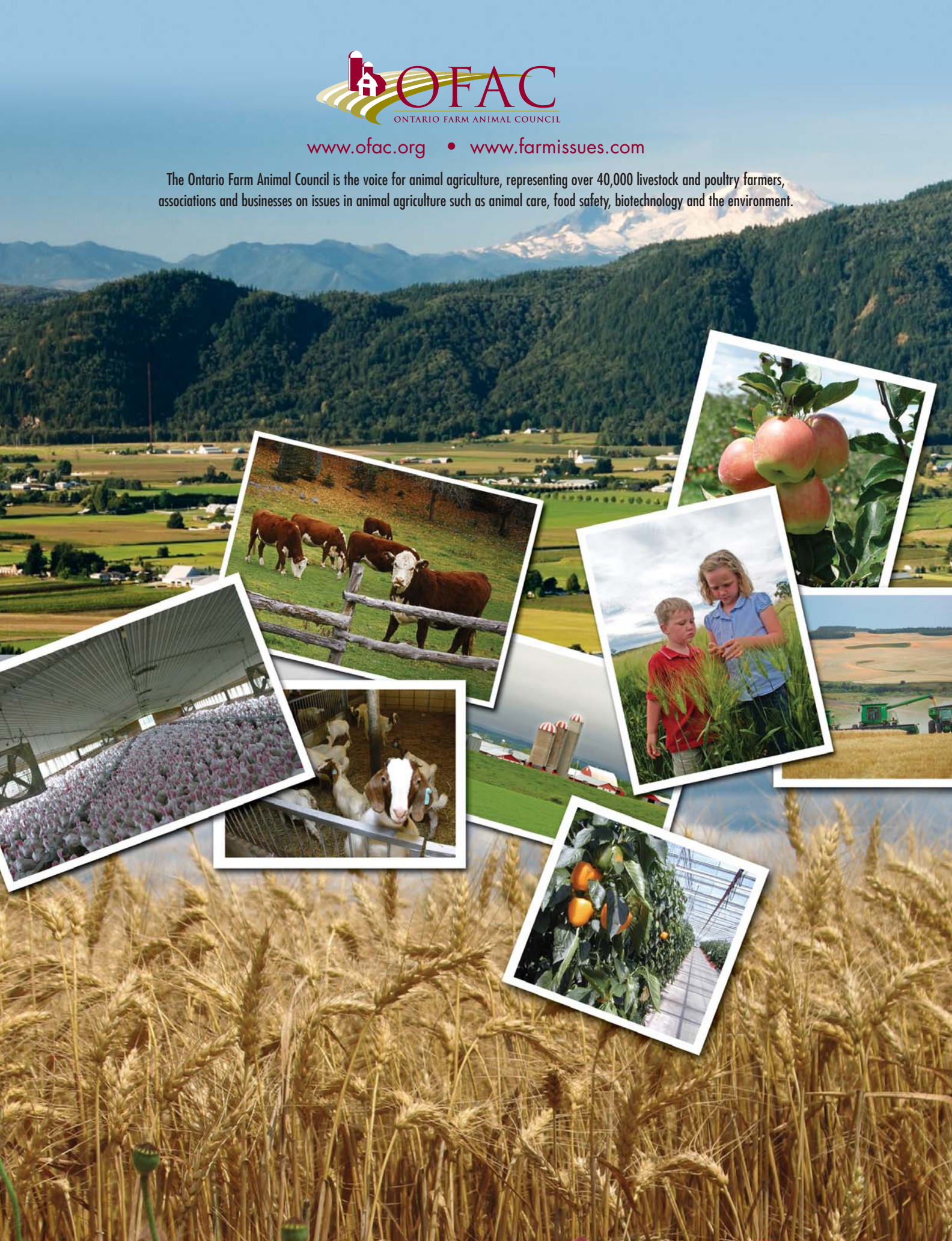
The Ontario Farm Animal Council is the voice for animal agriculture, representing over 40,000 livestock and poultry farmers, associations and businesses on issues in animal agriculture such as animal care, food safety, biotechnology and the environment.