Canadian Food System INSIGHTS
GMO

We all want to make safe and informed decisions about the food we eat, but what information is credible? This report uses academic, government and industry research to provide a breakdown of complex information, as well as resources, if you wish to dive into additional research. It's Good, Canada's goal is to enable Canadians to make their own choices and feel confident about the food on their plates.

IMPORTANT FACTS:

1. Genetic modification (GM) or genetic engineering (GE) is a more precise and targeted method used by scientists to create products with desirable traits. Experts modify a cell in an organism using gene technology and provide the right environment for the modified cell to grow into an adapted organism.
2. Artificial selection is when humans alter the natural selection process. For centuries, humans have been selecting and supporting growth of organisms with desired traits whether it be dog breeds, farm animals or field crops.
3. Modern technology like GM and GE techniques enables the food system to be more precise with pesticide and fertilizer application, improve nutritional profiles of food, increase hardiness and resilience to insects and weeds and improve shelf life – as a few examples.
4. As of 2019, there have been zero scientific studies that show GMOs can compromise health.
5. GMOs allow farmers to grow crops more efficiently with less tractor time, less pesticides, and less labour which help to keep grocery bills lower for Canadians.
6. GM and GE technology aids the food system in decreasing food loss and waste, decreasing greenhouse gas emissions and contributing to a more sustainable and environmentally conscious food system.

THERE ARE CURRENTLY ONLY 11 GMO FOODS AVAILABLE FOR CANADIANS

Corn (field & sweet)   Soybeans   Cotton   Canola   Arctic Apples   Innate Potato   Aquabounty Salmon

Alfalfa   Sugar Beets   Papaya (Hawaiian)   Squash

Let's Talk GMOs

Genetically Modified Organisms are the result of genetic engineering (GE) or genetic modification (GM). Genetically modified organisms (GMOs) are living organisms that have had their genetic composition altered.6 Genetic modification (GM) or genetic engineering (GE) is a more precise and targeted method used to achieve a desired trait in an organism. The process consists of the insertion of a gene or genes into the nucleus of an individual cell in a laboratory. Once the cell is modified, scientists will provide the ideal growth environment and the single cell will continuously divide until a complete organism (i.e. plant) has developed. Every cell of this organism will now contain the desired gene.4 Genetic modification is most commonly attributed to farming, although the process is used with bacteria and fungi when developing medication to cure and prevent diseases (i.e. vaccinations). One such medication developed using genetic modification is insulin, used to manage diabetes. Genetic modification or genetic engineering in respect to agricultural crops focuses on producing crops with improved nutritional value, resistance to pests (insect and disease), and tolerance to herbicides. In aquaculture as an example, GE technology is utilized to create a more sustainable system by breeding fish that require less feed, less veterinary care and have a decreased impact on the environment.4

Genetic Selection is the preference of a certain trait in a species, resulting in an increased prevalence of this trait compared to others. There are two types of selection; natural selection and artificial selection. Natural selection occurs when surrounding environmental pressures select for a specific trait, otherwise known as evolution. For example, a moth that blends into the environment may have preferential survival compared to a moth more readily seen by predators. Additionally, traits preferred for mating may be selected for by species. An example of this is the magnificent tail feathers seen on male peacocks; female peacocks are more likely to choose a mating partner with vibrant tail feathers, compared to those without.4 Artificial selection is when humans alter the natural selection process. For centuries humans have been artificially selecting organisms for desired traits, whether it be dog breeds, farm animals or field crops. In respect to agriculture, humans select desirable or advantageous characteristics such as efficiency, taste and health.4 Corn, or maize, is an important crop that underwent artificial genetic selection. The maize plant we know today is vastly different from the plant (known as teosinte) that was around 10 000 years ago.5 Farmers in Mexico selected plants that produced larger cobs, had a better taste, and produced kernels that were easier to grind into flour.5 Farmers would save kernels from the best plants to re-plant the following season.5 This process of genetic selection is responsible for one of the most important crops grown globally today.5

It's GOOD
CANADA

WHY DO WE NEED GMOs?

GMOs are needed in the agri-food industry to keep up with the demands and expectations of Canadians and an increasing population. Farmers utilize GMO and genetic engineering technology to provide healthy, affordable, fresh and great tasting food for you family.

Labelling

In Canada it is not mandatory to identify products that are GMOs1. Watch out for the 'Non-GMO' label that is on thousands of products in the grocery store that do not have a GMO alternative.

Regulations

In Canada, to have a GMO approved for commercial use, companies must submit scientific data for review and receive approval by Health Canada before they can be sold to consumers3. Canada has developed a "clear and stringent process for evaluating the safety of food derived through genetic modification".1
Health Canada is responsible for developing policy and setting standards related to the health and safety aspects of labelling under the Food and Drugs Regulation Act. The Canadian Food Inspection Agency (CFIA) is responsible for applying the policies and working to enforce the regulations.1

Health & Safety

Over the past 12 years, Health Canada has reviewed the safety of GM and GE no published scientific evidence demonstrating they are less safe than other foods. A rigorous safety assessment framework addresses potential risks associated with all foods and ensures that new and modified foods are safely introduced into Canada.1 The World Health Organization stated that no effects on human health have been shown as a result of consumption of GM foods in 2014 with continuous safety assessments being conducted daily.2 There have been over 4000 safety assessments conducted by 67 countries worldwide with none identifying any health concerns.

References:

1. Frequently Asked Questions – Biotechnology and Genetically Modified Foods (2018) Health Canada. Accessed October 1st, 2019 2.
2, Frequently Asked Questions on GMO Foods. The World Health Organization. Accessed on December 5th, 20193.
3. Genetically Modified (GM) Foods and Other Novel Foods (2016) Government of Canada. Accessed on October 1st, 2019. 4.
4. Jessica Quinn, MSc. Candidate, Weed Science, Dept. of Plant Agriculture, University of Guelph5. Learn.Genetics (2019) Evolution of Corn. Evolution: DNA and the Unity of Life. Accessed October 3, 2019: 6.
5. Purdue University (2019) What are GMOs. The Science of GMOs. Accessed October 3, 2019