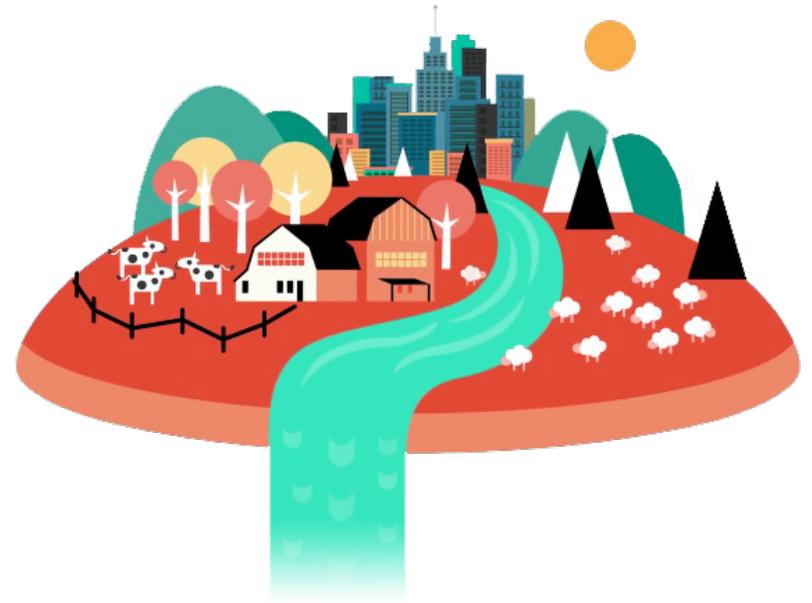


FEEDING CANADA

Exploring Our Food System

– A VIDEO SERIES –



FOOD SAFETY



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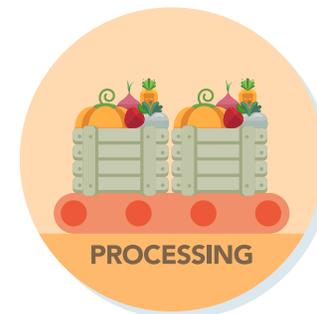
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INTRODUCTION

Rationale for the Development of the Food System Education Project

Several programs of study in Nova Scotia's grades 7–12 curricula include learning outcomes that link to food systems, including Science, Health, and Social Studies. These outcomes include exploration of food production, food safety, food security, sustainable farming practices, preservation of farmland, local foods, factors influencing personal food purchases, and overall environmental responsibility. Current curricula and interest in food systems from both students and teachers present an opportunity to provide accurate, evidence-based representation of farming practices in Canada. The Curriculum Connections on pages 15 and 16 highlights specific learning outcomes associated with each video.

Goal of Feeding Canada Video Series

The goal of this series is to provide a well-researched, engaging, and balanced exploration of the Canadian food system.

Purpose of Teacher Discussion Guide

This discussion guide provides you with thought-provoking questions and answers to help facilitate a robust discussion around each topic in the video series. Specific learning objectives are addressed for each video. Questions will help students think critically about the issues that will be discussed during the video, help enhance the discussion after viewing, and help to meet all learning objectives for each video.

This guide provides additional in-depth information on each topic along with credible references for further exploration. Extension ideas have also been included to enrich the student learning experience.

FEEDING CANADA

Exploring Our Food System

— A VIDEO SERIES —



Using the Feeding Canada Videos

The Feeding Canada series comprises six short videos that range from 2 to 10 minutes in length. Each video explores issues relevant to the food cycle that may broadly or specifically affect farmers, the food industry, the public, and/or the environment. For a comprehensive examination of the issues relevant to Canada's food system, we recommend that all videos be viewed throughout the semester.

Required Materials

- Internet access
- Access to video link
- Computer, screen, and projector
- Chart paper and markers



FEEDING CANADA VIDEO SERIES

Video 1: Sustainable Farming

- Introduces the concept of a food cycle
- Defines and discusses sustainable farming practices and provides examples of how Canadian farmers use sustainable farming practices

Video 2: Farm Animal Care

- Introduces the concept of animal welfare and the regulations and best practices used to ensure animal well-being

Video 3: Food Safety

- Discusses the extensive regulations and safety measures in place at various stages of the Canadian food system to maintain food safety and human health

Video 4: Antibiotics and Growth Hormones

- Identifies regulations and safeguards in place in Canada to protect human and animal health
- Examines the use and regulation of antibiotics and hormones in food production

Video 5: Biotechnology

- Introduces the concept of biotechnology and its impact on food production

Video 6: Wasted Food and Food Recovery

- Explores the impact of wasted food and examines Canadian-based initiatives at various stages of the food cycle that are helping to reduce and manage food waste



USING CREDIBLE INFORMATION IN DISCUSSIONS AND ACTIVITIES

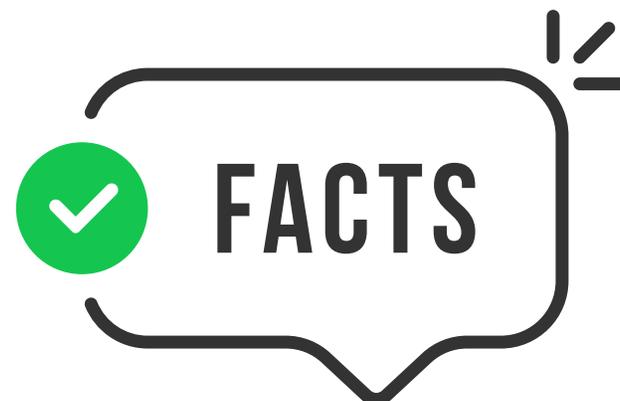
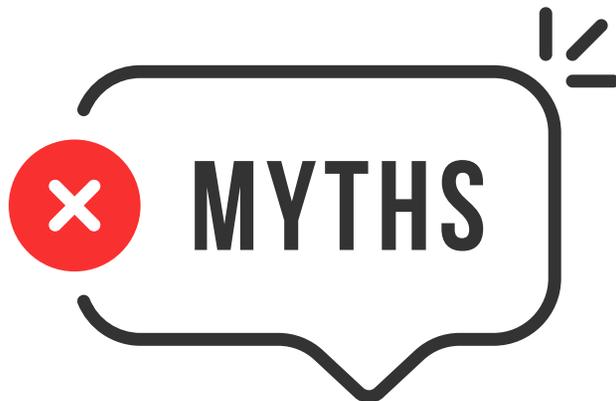
While agriculture has been prominent in Canada for more than a century, over time, our connection and relationship with food has changed. The decrease of firsthand knowledge and experience related to farming and food production increases the importance of using credible sources of information to learn about agriculture and food systems.

Food documentaries and farming exposés may be popular; however, they are often controversial and fraught with misinformation. Additionally, they commonly

- discuss international farming practices, which may not apply to the Canadian context;
- provide anecdotal rather than evidence-based arguments; and
- show content that is gratuitous in nature using rare examples that misrepresent what is common practice.

If students cite these types of sources, we suggest directing them to evidence-based resources that are current and Canadian-focused and that emphasize the perspectives of those working in the agricultural sector, including farmers, veterinarians, and researchers. Examples of these types of resources are found in the Additional Resources and Extended Learning sections of this guide.

We recognize that you or your students may have questions beyond the scope of what we have provided. Fortunately, there are many people and groups in the Maritimes that would be happy to help find answers to your questions. Reach out to people working in the agricultural sector in your community (e.g., farmers, veterinarians, agronomists), approach organizations with in-depth knowledge such as [Agriculture for Life](#) or use reputable websites such as [Agriculture and Agri-Food Canada](#). You can also connect with our team of Registered Dietitians at infnutrition@dfc-plc.ca with the subject line “Feeding Canada Video”.





FOOD CYCLE INTRODUCTION

Each video in the series begins with an introduction to the food cycle. This message is reiterated throughout the series because it is important for students to have a strong understanding of the food cycle and how each component shapes the food system. Each video highlights specific issues relevant to key stages of the food cycle.



The Food Cycle

The agricultural food cycle is the journey food travels to reach the consumer. This cycle moves from the farm to food processing, distribution, access and consumption by consumers, to food waste, and back again to production. Each step of the food cycle is vital to the cycle's success and cannot work without the other steps. The food cycle includes local, household, and individual food systems and functions as part of the larger national and global food system, which has a significant impact on our health, the economy, and the environment.

Production: Farming practices that cultivate raw ingredients.

Processing: Preparation of food products from raw ingredients (e.g., the picking and packaging of fruit).

Distribution: Transportation – how food products reach the market system and the end user – the consumer.

Access: Market and retail accessibility connected to consumers through purchasing.

Consumption: Intake of food by consumers, whether at home or away from home.

Waste management: Treatment of waste from its creation to its disposal and/or recycling.



FOOD SAFETY



Estimated Time: 30 minutes for video viewing and pre- and post-video discussion

Learning Objectives

Students will

- Identify who sets food safety regulations in Canada
- Explain how the Hazard Analysis Critical Control Point (HACCP) approach helps keep people safe
- Describe at least three steps consumers can take to ensure food safety

Background

Food safety is a collective responsibility of government, industry, and consumers. All food producers and operators are responsible, under Canadian law, for the safety of the food they produce and distribute.¹ Canadians are fortunate to have extensive regulations and safety measures in place all along the food production system. All parts of the food cycle have an impact on food safety; when the system is cohesive, food stays safer and communities remain healthier.

Food Safety Practices and Governance

Under the *Food and Drugs Act*, anyone who sells food in Canada is responsible for making sure it is safe to eat.¹ The Canadian Food Inspection Agency (CFIA) enforces food safety regulations for both domestic foods (those grown or produced in Canada) and imported foods (those brought in from other countries).² The CFIA is responsible for the administration and enforcement of the acts and regulations for everything from crop seeds to honey, eggs, dairy products, and meat.²

On the Farm

On-farm safety programs identify critical points where food safety could be at risk. Farmers, farming organizations, and governments have developed management practices and protocols to ensure everyone is using safe handling techniques. Farming groups have developed their own on-farm safety programs specific to their sector.³ These protocols are guided by the **Hazard Analysis Critical Control Point (HACCP)** principles used throughout the food chain – from the farm to the processor to the retailer – to ensure safe food practices.³



HACCP is a systematic preventive approach to food safety. HACCP goes beyond simply inspecting finished food products by helping to find, correct, and prevent hazards throughout the production process.⁴ Hazards can include physical, chemical, and biological hazards that would place consumers at risk of food-borne illness.⁴

The seven main principles of HACCP protocols are

- hazard analysis;
- identifying critical control points;
- establishing critical limits for each critical control point;
- establishing monitoring procedures;
- establishing corrective actions;
- establishing verification procedures;
- record keeping.⁴

Many of these programs go beyond basic food safety to guide on-farm processes related to food quality, traceability, biosecurity, animal care, and environmental stewardship. The following are examples of these on-farm assurance programs:

- **proAction**[®] – Dairy Farmers of Canada (www.dairyfarmers.ca/proaction)
- **Start Clean–Stay Clean**[®] – Egg Farmers of Canada (www.eggfarmers.ca/2016/11/start-clean-stay-clean-how-we-make-sure-eggs-are-safe-and-healthy/)
- **Verified Beef Production Plus** – Canadian Cattlemen’s Association (www.verifiedbeef.ca/)
- **Animal Care and On Farm Safety Programs** – Chicken Farmers of Canada (www.chickenfarmers.ca/sections/food-safety-and-animal-care/page/2/)

Food Processors and Retailers

Like farmers, food processors and retailers have a responsibility to verify that they keep the foods they handle safe. The CFIA provides guidelines to ensure safe practices are employed and enforces these policies and standards.² Best practices in food processing, during distribution, and at the retail and food service level can help keep food safe and also reduce food waste. For example, food inventory should be stored and used based on the first in, first out principle.⁵ This allows food to be used before its best before or expiration date, minimizing spoilage and reducing the possibility of expired food reaching the consumer.⁵

Consumers

Consumers can help protect themselves and their families by following safe food handling practices at home and staying informed about food recalls and allergy alerts. At home, consumers can follow four easy steps to stay food safe: clean, separate, cook, and chill.⁶ These steps translate into simple food handling practices: wash hands before and after handling food; keep raw meats away from other foods (e.g., use two different cutting boards – one for meat and one for vegetables); keep hot foods hot and cold foods cold (out of the temperature danger zone, 4–60°C); use meat thermometers to ensure proper internal temperatures; refrigerate leftovers and know how long they will keep; and learn more about how to properly use best before dates.⁶

This video explores the different responsibilities of stakeholders within the food cycle and how a systematic prevention approach can ensure the health of communities both now and in the future.



DISCUSSION QUESTIONS

Pre-video

Q1: Why do you think food safety is an important part of the food cycle?

A1: There is no single answer here because food safety is important for many reasons. The aim is to get students thinking about the dangers of food contamination (e.g., leading to stomach aches or more serious illness). Also, students should try to think about the different parts of the food cycle that play a role in food safety. Food safety does not begin in the home or at the supermarket, but starts at the farm and moves through the food cycle. There is the potential for safety to break down at any point of the cycle, leading to negative consumer consequences. Luckily, in Canada a number of safety protocols and regulations are in place to protect food from contamination. A number of these regulations will be discussed in the video.

Q2: Have you ever been affected by food contamination? How did this influence your views of the food cycle?

A2: Again, there is no single answer. The aim is to have students think about how food contamination can affect consumers if regulations and proper food handling steps are not followed. Also, it is important for students to think about the negative impact they or someone they know may have experienced from food contamination. This helps to highlight why it is important that Canada has food safety regulations and that stakeholders at each point of the food cycle take responsibility for ensuring these regulations are met.

Post-video

Q3: Who is responsible for maintaining food safety in the food cycle? Who enforces food safety?

A3: Food safety is a collective responsibility of government, industry, and consumers. All food producers and operators are responsible, under Canadian law, for the safety of the food they produce and distribute.¹ This includes farmers, processors, distributors, retailers, government, and consumers.

Because of the interconnectedness of the food cycle, an error in one part of the system can have lasting implications for other areas. Therefore, collective responsibility is important for maintaining food safety. Everyone has a role to play to ensure that food stays safe, enabling communities to stay healthier today and in the future. The CFIA is responsible for enforcing the Safe Food for Canadians Regulations and ensuring that stakeholders at all points in the food cycle are upholding their responsibility.²

Q4: HACCP, or Hazard Analysis Critical Control Point, is a systematic preventive approach to food safety. How does HACCP help keep people safe?

A4: HACCP goes beyond simply inspecting finished food products by helping to find, correct, and prevent hazards throughout the production process.⁴ These include physical, chemical, and biological hazards that could ultimately place consumers at risk of food-borne illness.⁴



The seven main principles of HACCP protocols are:

- hazard analysis;
- identifying critical control points;
- establishing critical limits for each critical control point;
- establishing monitoring procedures;
- establishing corrective actions;
- establishing verification procedures;
- record keeping.⁴

These principles are applied throughout the food cycle – from the farm to the processor to the retailer and to the consumer – to maintain food safety.^{3,5} In the dairy industry, for example, the HACCP approach ensures that the drivers who pick milk up from farms inspect and sample it, that milk is tested at the processing plant, that farm samples are tested in labs, that milk is pasteurized at the processing plant, and that it remains at a safe temperature throughout the journey through the food cycle (i.e., the cold chain remains intact).⁷

Q5: What were some things identified in the video that consumers can do to ensure food safety?

A5: The video identified a number of things that consumers can do to stay food safe. The four broad categories for maintaining food safety are clean, separate, cook, and chill.⁶ In the video, these concepts are represented by simple steps that help keep foods safe: wash hands before and after handling food, keep raw meats away from other foods, keep hot foods hot and cold foods cold (out of the temperature danger zone of 4–60°C), use meat thermometers to ensure proper internal temperatures, refrigerate leftovers and know how long they will keep, and learn more about how to properly use best before dates.⁶ These examples are not an exhaustive list of everything that consumers can do to keep food safe.

Additionally, some consumers, such as adults over age 60, children under age 5, those with weakened immune systems, and pregnant women, may be especially vulnerable to food contamination and may have to take additional precautions.⁸ For example, children under one year of age should not be given honey because it can contain small amounts of spores of a bacterium called *Clostridium botulinum*.⁸ A baby's immature digestive system cannot handle these spores and babies can become very ill with infant botulism. Also, these vulnerable populations should avoid items like raw or lightly cooked eggs, unpasteurized beverages, and some cheeses.⁸



ACTIVITIES

My Food Cycle

Have students summarize their learning by creating a visual representation of the food cycle as they currently understand it, including what is involved at each stage. Encourage students to add to their visual representation as they progress through the video series. Options may include creating a sketch or drawing, or making a mind map or chart.

Free Writing and Reflection

After viewing the video series (or as many of the videos as deemed appropriate for a specific course), have students complete the following reflection activity:

Give students 5–10 minutes to free write about their key learnings from the video series as well as any lingering questions. The aim is for them to recognize their learning and any changes in their knowledge or perceptions. Then encourage students to share highlights from either their visual representation or free writing with the class.

Food Safety Challenge

Students will develop a food safety plan for a large-scale food event. Divide students into small groups of about four. Ask them to imagine they are in charge of organizing a school-wide breakfast and are responsible for ensuring that the food they are providing is safe to eat. Have them decide on the menu, then create a food safety checklist that includes considerations for before, during, and after the event.

If students need support and idea starters, refer to Health Canada's *Food Safety and You* (www.canada.ca/en/health-canada/services/general-food-safety-tips/food-safety-you.html).

Option 1: Pair up the groups and have them swap menus and food safety checklists. Ask each group to review their peers' plans and make recommendations where relevant.

Option 2: Have students complete the activity individually and present their menu and food safety checklist in a slide deck or one-page handout.

Additional Resources

- [Food Safety snapAg](#)
- [Best Before and Expiration Dates on Food, Health Canada](#)
- [Canadian Food Inspection Agency](#)



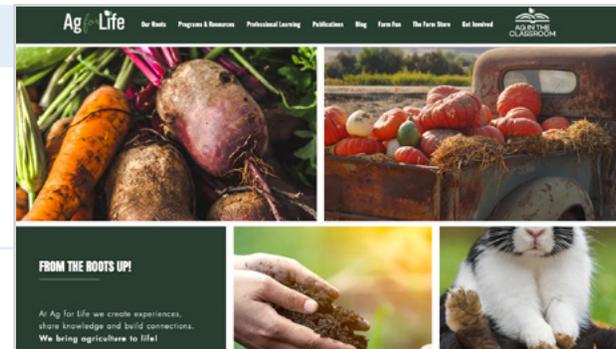
EXTENDED LEARNING

If you would like to continue exploring food systems in Canada, check out the following.

Ag for Life

Website address: www.agricultureforlife.ca

A variety of programs designed to empower audiences to think both critically and creatively and to give students a real awareness of agriculture and food production.



The Real Dirt on Farming

Website address: www.realdirtontfarming.ca

A digital magazine about food and farming in Canada that covers topics such as food safety, the environment, and the humane treatment of farm animals.





REFERENCES

1. Health Canada. 2008. Canada's *Food and Drugs Act* and regulations. www.canada.ca/en/health-canada/services/food-nutrition/legislation-guidelines/acts-regulations/canada-food-drugs.html. Accessed March 12, 2021.
2. Canadian Food Inspection Agency. 2020. The Safe Food for Canadians Regulations are here. www.inspection.gc.ca/food-safety-for-industry/toolkit-for-food-businesses/the-safe-food-for-canadians-regulations-are-here/eng/1547488355844/1547488356203. Accessed March 12, 2021.
3. Government of Alberta. 2021. On-farm food safety programs. www.alberta.ca/on-farm-food-safety-programs.aspx. Accessed March 12, 2021.
4. Government of Alberta. 2021. Hazard Analysis Critical Control Point program planning. www.alberta.ca/hazard-analysis-critical-control-point-program-planning.aspx. Accessed March 12, 2021.
5. Canadian Food Inspection Agency. 2021. The Food Safety Enhancement Program approach to a preventative control plan. www.inspection.canada.ca/preventive-controls/preventive-control-plans/the-food-safety-enhancement-program/eng/1525869691902/1525869759693. Accessed March 12, 2021.
6. Health Canada. 2021. Food safety and you. www.canada.ca/en/health-canada/services/general-food-safety-tips/food-safety-you.html. Accessed March 12, 2021.
7. Dairy Farmers of Canada. 2019. Food safety: Canadian milk from farm to table. www.dairyfarmersofcanada.ca/en/who-we-are/our-commitments/food-safety-canadian-milk-farm-table. Accessed March 12, 2021.
8. Health Canada. 2019. Food safety for vulnerable populations. www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-vulnerable-populations.html. Accessed March 12, 2021.



CURRICULUM CONNECTIONS

Grade 7

Practical Applied Arts

Technology Ed 4.1 Demonstrate an understanding of all safety features of production technology machines and equipment used to solve design problems.

Grade 8

Practical Applied Arts

Food and Nutrition 1.2 Recognize and apply safe food handling practices.

Technology Ed 4.1 Demonstrate an understanding of all safety features of production technology machines and equipment used to solve design problems.

Technology Ed 5.4 Demonstrate safe and healthy practices with regard to materials, processes, and equipment.

Grade 9

Practical Applied Arts

Technology Ed 4.1 Demonstrate an understanding of all safety features of production technology machines and equipment used to solve design problems.

Grade 10

Practical Applied Arts

Food for Healthy Living 10 1.1 Identify causes, symptoms, and prevention of food-borne illness.

Food for Healthy Living 10 1.3 Demonstrate safe food handling in the selection, storage, preparation, and serving of foods.

Food for Healthy Living 10 4.5 Examine and practice the steps involved in healthy and nutritious food preparation.

Food for Healthy Living 10 5.1 Explore, locally and globally, trends and issues related to food and well-being.

Food for Healthy Living 10 6.1 Be aware of career and employment opportunities related to food industry, food preparation, and nutrition.

Food for Healthy Living 10 6.2 Identify and evaluate personal qualities, skills, abilities, and interests related to career choices in food industry, food preparation, and nutrition.

FoodPrepService 10 1.3 Demonstrate safe food handling in the selection, storage, preparation, and serving of foods.

FoodPrepService 10 1.1 Identify causes, symptoms, and prevention of food-borne illness.

FoodTech 10 1.1 Identify causes, symptoms, and prevention of food-borne illness.

FoodTech 10 1.3 Demonstrate safe food handling in the selection, storage, preparation, and serving of foods.

IntFoods 10 1.1 Identify causes, symptoms, and prevention of food-borne illness.

IntFoods10 1.3 Demonstrate safe food handling in the selection, storage, preparation, and serving of foods.



Grade 11

Practical Applied Arts

Ag/Agrifood11 AG-10 Explain the relationships among the variables (space, food, population, and health) for livestock and/or plant farming.

Ag/Agrifood11 AG-14 Compare the risks and benefits to society and the environment of production while maintaining health, preventing pests and diseases, and supply and demand.

Ag/Agrifood11 AG-15 Explain how funding, regulations, and quotas affect farming.

Ag/Agrifood11 AG-19 Synthesize information and present their findings on the effects on farming and production with respect to policies, regulations, and career regulations.

Ag/Agrifood11 AG-21 Compare food safety regulations and processes locally and compare globally.

Grade 12

Practical Applied Arts

FoodSci12 2.2 Explain food spoilage in terms of the growth of microorganisms (appearance of off-flavours, off odours, slime, visible growth).

FoodSci12 2.3 Describe the role that processing and food additives play in eliminating, inhibiting, or delaying the growth of spoilage microorganisms.

FoodSci12 2.4 Explain simple measures that can be taken to keep foods safe.

FoodSci12 2.5 Explain how viruses, bacteria, moulds, and parasites can cause disease.

FoodSci12 2.6 Explain practical methods of food preservation.

FoodSci12 4.3 Design, develop, make, and present a food product identifying and anticipating major variables that may impact on the final quality of the product.

FoodSt&Hospitality12 1 Demonstrate knowledge of safety and sanitation procedures within the professional food service operation.

FoodSt&Hospitality12 1.1 Complete basic certification in first aid, food handling, and WHMIS.

FoodSt&Hospitality12 5.6 Identify and practice healthy methods of food preparation.



GLOSSARY

Access: Market and retail accessibility connected to consumers through purchasing.

Consumption: Intake of food by consumers, whether at home or away from home.

Distribution: Transportation – how the food products reach the market system and the end user – the consumer.

Hazard Analysis Critical Control Point (HACCP): A systematic preventive approach to food safety that has been in use since the 1960s. HACCP goes beyond simply inspecting finished food products and helps to find, correct, and prevent hazards throughout the production process. Hazards include physical, chemical, and biological hazards that would place consumers at risk of food-borne illness.

The seven main principles of HACCP protocols are hazard analysis, identifying critical control points, establishing critical limits for each critical control point, establishing monitoring procedures, establishing corrective actions, establishing verification procedures, and record keeping.

Processing: Preparation of food products from raw ingredients (e.g., the picking and packaging of fruit).

Production: Farming practices that cultivate raw ingredients.

Waste management: Treatment of waste from its creation to its disposal and/or recycling.

Tell us how you used this resource with your class and let us know if you have any suggestions for improving it by emailing infnutrition@dfc-plc.ca.

We appreciate your feedback!

TeachNutrition.ca[™]

By Dairy Farmers of Canada's Registered Dietitians