LEARNING EXPERIENCE THREE

Guiding Question: How do food trends influence agricultural technologies?

This **Learning Source** provides starting points and information to investigate: • Consumer interests and food trends • Innovative food technologies • Biotechnologies • Media messaging	**Build Competencies: Food identities** Students fact-check media messages about foods and food production and evaluate scientific claims. This handout includes activities that support competencies, literacy and numeracy, and weblinks to online resources that can support student learning.	**Assess** Look for evidence of understanding of the following concepts: • Biotechnologies • Agricultural technology • Evidence-based information For a formative assessment, ask students to create a **Wheel Chart** that identifies the diversity of technologies that are used in agriculture and food production. Encourage students to identify different types of technologies in each spoke of the wheel, including bio and computer technologies.

Additional Research or Background Sources

Consult teacher or student background sources such as the examples that follow to further explore, enrich or expand activities for this guiding question. Student research sources are also provided in **Build Competencies** handouts.

Spark discussion with examples of media articles that deal with consumer perceptions of the food system, such as Canadians confused by food marketing (May, 2019) from Greenhouse Canada and found at **www.greenhousecanada.com/news/canadians-confused-by-food-marketing-32953**.

Agriculture and Agri-Food Canada's report on Socially Conscious Consumer Trends (2012) provides some insights into consumer preferences and trends and can be accessed at **www.agr.gc.ca/resources/prod/Internet-Internet/MISB-DGSIM/ATS-SEA/PDF/6308-eng.pdf**.

The Pendulum Swings 2016 Food Trends for Industry Processors, at **http://westerngrocer.com/the-pendulum-swings-2016-food-trends-for-industry-processors/**, provides some insights into food-specific trends and is suitable as teacher background.

Find a series of public opinion research and consultations from Agriculture and Agri-Food Canada, including reports dealing with innovative agricultural technology and consumer perceptions of food at **www.agr.gc.ca/eng/about-us/public-opinion-research-and-consultations/?id=1362063362371**.

Additional information and discussion questions are provided in the carousel slide for this guiding question in the smart AGRICULTURE section of the LEARN webpage.

Click on the carousel slide to open and explore the following content.

- An overview of **media messaging** and examples of myths and misconceptions about agriculture:
  - Myth 1: Corporate/factory farms are taking over agriculture.
  - Myth 2: Hormones, genetically modified crops and antibiotics are bad.
  - Myth 3: Farmers overuse dangerous chemicals/pesticides.
  - Myth 4: Farming is not environmentally friendly.
  - Myth 5: Food prices are too high.

Find **Science 9** learning outcomes supported by this learning experience on the following page.

Use this activity to reinforce the concepts of genetics and biodiversity in the context of agriculture and the food system. Make the connection between these concepts and their relevance to food production, the availability of food and the trends and market pressures that influence them.

Encourage students to use this information to focus on the reliability and credibility of media messages that shape food decisions in everyday contexts - such as through marketing and advertising messages.

After completing activities in this learning experience, have students reflect on the importance of critical thinking when assessing information and making decisions about food.

Look on the **VIEW** webpage for video interviews with Alberta farmers about local food production and agricultural technologies. As students watch the video, ask them to identify perspectives shared by farmers.

The Government of Canada provides additional information on novel foods, including genetically modified foods, at **www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/factsheets-frequently-asked-questions/novel-foods.html**.

Agriculture and Agri-Food Canada provides an overview of consumer preferences, technologies and innovative food ingredients in Emerging Food Innovation: Trends and Opportunities at **www.agr.gc.ca/eng/industry-markets-and-trade/canadian-agri-food-sector-intelligence/processed-food-and-beverages/trends-and-market-opportunities-for-the-food-processing-sector/emerging-food-innovation-trends-and-opportunities/?id=1449236177345**.

> EXTEND LEARNING

Have students search for **misleading media headlines or messages** that reflect the ideas and perspectives discussed and learned from this guiding question. Ask students to correct the headline or message and provide evidence-based information or research that backs it up. Students can be asked to identify and fact-check one or more headline or message for any media format and around a food trend related topic that interests them, such as the following examples:

- Genetic sciences in agriculture and food
- How species variation in livestock agriculture affects the availability of food
- The use of pesticides, hormones or antibiotics in agriculture
- Sustainable farming practices
- GMO food products

Students may also revisit the **Spark Questions about smart** AGRICULTURE source, **How is biotechnology part of smart agriculture?** to consider additional information and perspectives.

Invite students to share their fact-checking with a partner. Then, share and discuss examples as a class. How does students' research provide insights into attitudes and perceptions that shape food trends?

Learning Experience Three: Learning Outcomes and Competency Map

project AGRICULTURE Activity	GRADE 9 SCIENCE	SCIENCE 10	SCIENCE 14
	CONCEPTUAL KNOWLEDGE	**CONCEPTUAL KNOWLEDGE**	**CONCEPTUAL KNOWLEDGE**
LEARNING SOURCE How do food trends influence agricultural technologies?	**Unit A Biological Diversity** 3. Describe, in general terms, the role of genetic materials in the continuity and variation of species characteristics; and investigate and interpret related technologies • Describe, in simple terms, some genetic technologies (e.g., cloning and genetic engineering); and identify questions and issues related to their application 4. Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making • Investigate and describe the use of biotechnology in environmental, agricultural or forest management; and identify potential impacts and issues (e.g., investigate issues related to the development of patented crop varieties and varieties that require extensive chemical treatments; identify issues related to selective breeding in game farming and in the rearing of fish stocks) Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., strive to assess a problem accurately by careful analysis of evidence gathered; critically consider ideas and perceptions, recognizing that the obvious is not always right) Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider implications of changing land use on the welfare and survival of living things; identify potential conflicts between attempting to meet the wants and needs of humans and, at the same time, providing life-supporting environments for all living things; minimize environmental impact during studies by avoiding sampling that will affect an animal or plant population)		
	PROCEDURAL KNOWLEDGE	**PROCEDURAL KNOWLEDGE**	**PROCEDURAL KNOWLEDGE**
BUILD COMPETENCIES Trending food messages	**Unit A Biological Diversity** Ask questions about the relationships between and among observable variables, and plan investigations to address those questions • Identify science-related issues (e.g., identify issues related to loss of species diversity) Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data • Observe and record data, and prepare simple line drawings (e.g., compare two related plants by measuring, describing and drawing them) • Research information related to a given issue (e.g., conduct an electronic search for information on factors that affect the reproduction and survival of wood frogs) Analyze qualitative and quantitative data, and develop and assess possible explanations • Interpret patterns and trends in data, and infer and explain relationships among the variables (e.g., interpret data on changing animal populations, and infer possible causes) • Apply given criteria for evaluating evidence and sources of information (e.g., evaluate sources based on their currency, credibility and the extent to which claims are supported by data) • Identify new questions and problems that arise from what was learned		