

## Food Production: Human Factors

The physical environment is not the only thing that farmers must consider. If farmers are to survive, they must make a profit and so it is no surprise that economic factors play a large role in the business of farming. Examples of these economic factors are

- selling prices
- land values
- competition
- available transportation
- size and location of consumer markets

Not only are there natural environment and economic factors, there are also political considerations. Governments create many regulations and policies that affect farmers.

## Food Production and Distribution until 1920

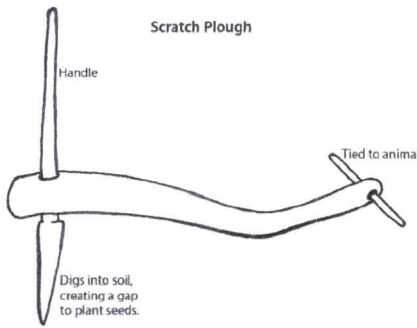
Traditionally, over thousands of years, food production was centred on two key factors.



- Labour-intensive work
  - Agricultural activities are done by the physical labour of humans such as the farming of **grain**, produce, and livestock.
- Personal food preparation
  - Individuals and families would grow, process, and prepare food for their own personal consumption.

A considerable percentage of the population was directly involved in farming and, in the process, many people actually fed themselves, from field to table.

A series of technological breakthroughs throughout history significantly increased the amount of food that humans could produce. Following is a timeline providing examples of some of these innovations.

3000 BCE	<p>Improved ploughs allowed domesticated animals to pull a sharp stick through the soil, creating a gap in which seeds could be planted. These were called <i>scratch ploughs</i>. Prior to this, early farmers planted their seeds using a stick to dig holes.</p> 
500–900 CE	<p>Ploughs that included an iron knife-like blade were developed. These could cut the ground and roots better than scratch ploughs.</p>
1000 CE	<p>In Europe, animals began to be used effectively in the process of farming; the horse collar was invented, which allowed the horse to pull an implement (like a plough) harder without choking itself. Harnesses were also invented, which allowed more than one animal to be attached to a single plough. The horseshoe allowed for horses to have better traction in muddy fields.</p>

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1750–1920 CE

Inventors and farmers were quick to add the benefits of **industrialization** to agriculture. They adapted machinery that was being used in factories and mines to produce more efficient farm equipment. Some types of machines included steam-powered tractors and threshing machines.

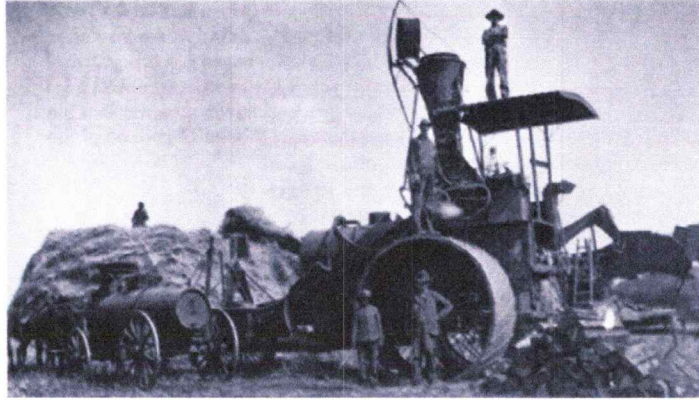


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Clark, Bruce W., and John K. Wallace. *Geographic Issues of the Twenty-first Century*. Don Mills, ON: Pearson Education Canada Inc., 2005. 263.

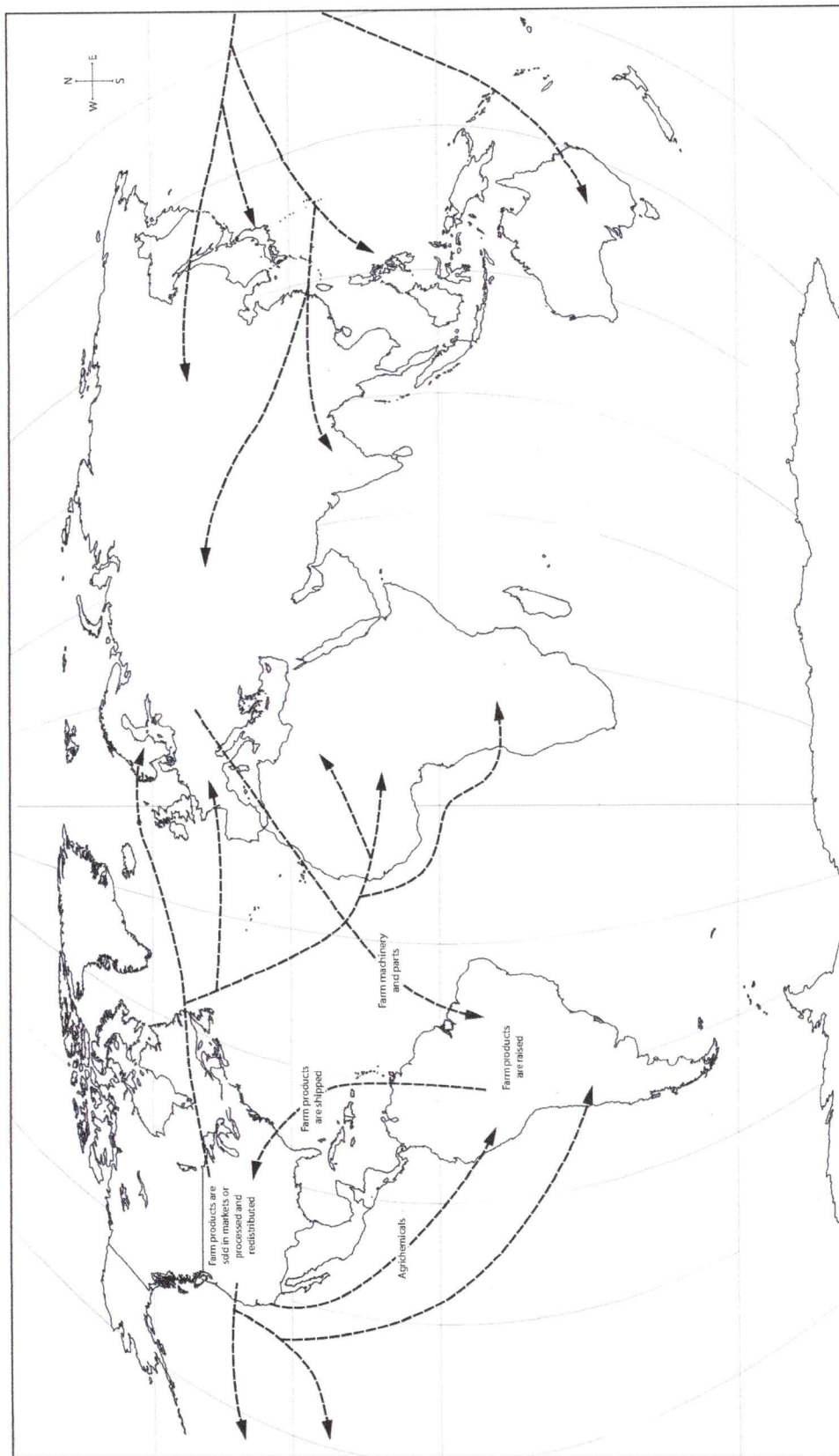
In the past, farmers did not have modern means of transporting food and keeping it from spoiling, and so the distribution of food took place in a relatively small area. For example, at one time, in The Pas, Manitoba, there were five dairy farms supplying the area with milk and milk products. Milk and dairy products were delivered to customers and retailers within a few days of cows being milked. Today, there are no local dairies in The Pas and milk is shipped in by truck and sold at local grocery stores. Parmalat is an Italian-owned dairy corporation and consumers in The Pas can purchase milk that was processed in Winnipeg but owned by a company from Italy!

## Food Production and Distribution in the 21st Century



The food industry has changed radically since the early 1900s. In contrast to what you have already read in this lesson, the modern food industry relies far more on technology, particularly on **mechanization** and **biochemistry**, than on human and animal labour. In this way, food is raised, manipulated, preserved, and transported, resulting in a food industry that is, to a great degree, global in nature. Food and related resources travel great distances in today's world. One example is the previously mentioned dairy company Parmalat.

## Food Production and Distribution in the 21st Century







Not only is food shipped great distances, so too are farm machinery and parts. Machinery and parts from Europe, and **agrichemicals** from the United States are all routinely shipped to farms in South America, where farm products are raised and shipped to North America for fresh market consumption or for use in processed foods, which may then travel to further points around the world!

This modern food system relies heavily on

- technology
- transportation
- management
- transportation logistics
- marketing
- government regulations

### Food Processing in the 21st Century

Food processing dates back to prehistoric times when humans processed food by fermenting, sun drying, preserving with salt, and cooking (roasting, smoking, steaming, and oven baking).

Food processing technology in the 19th and 20th centuries was largely developed to serve military needs. The canning and tinning of food was invented in France during the time of Napoleon in order to supply food to the French army. Pasteurization, discovered by Louis Pasteur in 1862, involves the process of heating liquids for the purpose of destroying harmful organisms and was another significant advance in the processing of food.



Since the end of World War II in 1945, a **consumer society** has developed in the world's industrialized countries, including Canada. At the same time, there has been a rise in the pursuit of convenience; food processors especially marketed their products to middle-class working wives and mothers. This shift in society—consumerism and mothers working outside of the home—has contributed to the growth of food processing. Innovations in food processing include

- spray drying
  - This is a technique for dehydrating fluid foods such as milk, coffee, and egg powders.
- juice concentrates
- freeze drying
  - This is a technique whereby perishable foods are dehydrated to make them more convenient for transport; instant coffee is often freeze dried.

- artificial additives
  - sweeteners
  - colourants
  - preservatives

Modern food processing has many benefits and at the same time creates issues. Good points associated with modern food processing include toxin removal, preservation, flavour improvement, ease of marketing and distribution tasks, and an increase in food consistency. In addition, it increases seasonal availability of many foods, enables transportation of delicate, perishable foods across long distances, and makes many kinds of foods safe to eat by removing micro-organisms. Food processing can also add extra nutrients. Modern supermarkets would not be possible without modern food-processing techniques.

On the other hand, modern food processing has drawbacks too. Food processing can greatly lower the nutritional value of some foods. Some preservatives that are added during processing may cause adverse health effects on some consumers. The addition of preservatives such as salt, and flavour enhancers such as sugar and fat, can add unnecessary chemicals and calories to our diet.

### Food Distribution in Canada

Canada's food distribution system represents the final link in the food supply chain from food producers (farmers) to processors to distributors and finally to us, the consumers. Food distribution is a large and complex sector that includes supermarkets, grocery stores, restaurants and fast food operations, as well as the wholesalers, distributors, and brokers that supply them. At the time this course was written in 2013, there were about 24,000 retail stores and close to 63,000 food service establishments in Canada, with total consumer sales of \$131 billion (in 2005). The sector employed 1.4 million people and accounted for 4% of Canada's total GDP.



## Learning Activity 3.2

### Food Production and Distribution



1. In the space next to each era in the timeline that follows, organize the advances in farming technology and food production. Each box represents a chronological time frame listed on the timeline.

Chronological Time Frame	
3000 BCE	
500-900 CE	
1000 CE	
1750- 1920	
21st Century	

*continued*



### Learning Activity 3.2: Food Production and Distribution (continued)

2. Read the case study below. In the chart that follows, describe each step of banana production and distribution from Central/South America to North America. Be sure to pay attention to the number of points you are to use as specified in each section. Some examples are provided to help you get started.

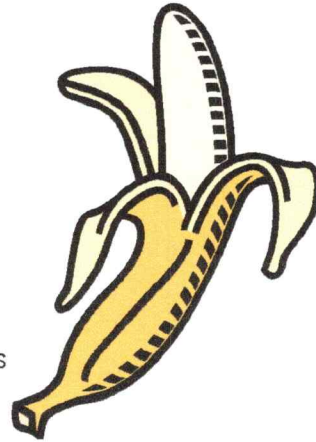
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#### Case Study: Canadians Go Bananas for Bananas

A recent study has shown that Canadians consumed an average of 13 kg of bananas in the year 2000. Compared to other fruit consumed in Canada—11 kg of apples and 9 kg of oranges—the banana is Canada's favourite fruit.

Where do all these bananas come from?

Bananas are grown in 132 countries; most of Canada's bananas come from Central and South America. The most common type of banana sold in Canada is the Cavendish banana, which is grown specifically for the North American market. The Cavendish banana is not only tasty, but is thick-skinned and, therefore, travels well.



Bananas are grown in tropical regions where the average temperature is 27°C and the yearly rainfall is 200 to 250 centimetres. They require moist soil with good drainage. Most bananas grown for export are harvested within 30 degrees either side of the equator.

Bananas are produced on farms called plantations. While there are a few small plantations owned by local farmers, most plantations are very large, as big as 5,000 hectares, and are usually controlled or operated by large transnational corporations.

The banana industry in Central America is still controlled by United States of America-based fruit companies. Chiquita Brands, Dole, and Del Monte are the "big-three" banana producers. Together, these companies control over 65% of the world banana exports. These fruit companies have developed many regions of Central America. They have constructed fully functioning company towns in primarily rural or undeveloped regions. They have constructed hospitals, schools, roads, railways, and communication systems to support their plantations. Despite this, workers on plantations work ten- to twelve-hour days, six to seven days a week, but earn only \$2,000 per year.

Bananas are picked and sorted by hand and then transported by truck to a packaging plant. They are shipped hard and unripe (green). At the plant, the bananas are cleaned and packaged, then sent by refrigerated truck or train to the export harbour. At the harbour, the bananas are placed in sealed, refrigerated containers and loaded onto a large container ship. From the harbour, the ship sails to a port in Canada—Vancouver, Montreal, or Halifax—where the bananas are either placed in a warehouse or loaded directly onto trucks.

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## Learning Activity 3.2: Food Production and Distribution (continued)

### Case Study: Canadians Go Bananas for Bananas (continued)

At the warehouse in Canada, the bananas are partially ripened in temperature-controlled units filled with ethylene gas. The bananas take about eight to ten days to ripen. After this, they are shipped to individual stores for sale to the consumer. The whole process—from picking to arrival at the supermarket—usually takes no longer than 20 days.

Along with natural factors, there are several human factors that affect the production of food. There are several stages in the production of food including growing, processing, transportation, and marketing. Distribution is the final link in the food supply chain from farmers to processors and finally to consumers. Food production has changed over time and we currently have a highly specialized process that relies heavily on modern technology, particularly on mechanization and biochemistry. Modern food production has both benefits and drawbacks.

Stage	Description
Growing	Bananas are grown in tropical regions where the average temperature is 27°C and the yearly rainfall is 200 to 250 centimetres. <i>Provide at least two clear and distinct points.</i>
Processing	<i>Provide at least one clear and distinct point.</i>
Transportation	They are shipped hard and unripe. <i>Provide at least two clear and distinct points.</i>
Marketing	<i>Provide at least one clear and distinct point.</i>
Consuming	<i>Provide at least one clear and distinct point.</i>

