Food Systems Feed the World

Grade Levels

6 - 8

Purpose

Students will explore the steps and processes that create a food system and gain an understanding of hunger as it relates to th physical well-being, culture, and geographic location of all people. Students will learn what a food system encompasses, create "food system chain," and discuss why hunger still exists despite modern advances that have made the US food system highly efficient.

Estimated Time

1 hour

Materials Needed

Activity 1

- *Who Makes Your Cereal?* activity sheet, 1 per student
- *Food System Chain* activity sheet, 1 per group (print each on a different color of paper)
- Stapler

Activity 2

- Peter Menzel's Hungry Planet Family Portraits (http://menzelphoto.photoshelter.com/gallery/Hungry-Planet-Family-Food-Portraits/G0000zmgWvU6SiKM/C0000k7JgEHhEq0w)
- *World Food Programme Hunger Map (https://docs.wfp.org/api/documents/WFP-0000118395/download/?_ga=2.178983012.1973992265.1600372985-1734913079.1561393944)*

Essential Files (maps, charts, pictures, or documents)

- Food System Chain Activity Sheet (https://cdn.agclassroom.org/media/uploads/2016/02/26/food_system_chain.pdf)
- Who Makes Your Cereal Activity Sheet (https://cdn.agclassroom.org/media/uploads/2016/02/26/who_makes_your_cereal.pdf)

Vocabulary Words

food bank: charitable organization that gathers, sorts, catalogs, and distributes food to those in need

food processing: the process of transforming raw agricultural products, like grains, vegetables, meat, or milk, into end produ to be sold to consumers

food system: the people, activities, and resources involved in getting food from farms, ranches, oceans, and other sources to consumers' plates

hunger: not getting enough food or not getting enough healthy food for good health and growth

Did You Know? (Ag Facts)

- Today's American farmer feeds about 155 people worldwide. In 1960 that number was 61.[1]
- In 2010, the US food system provided 4000 calories per person per day.[2]
- Accounting for waste, the average American consumed 2544 calories per day in 2010.[2]
- An estimated 40% of the food available in the United States goes uneaten.[3]

Background Agricultural Connections

Hunger affects the well-being of people, nations, and the world. When people are healthy, strong, and well nourished, they ha the energy, creativity, security, and courage to solve problems, create great works of art and music, contribute to scientific advances, and live their daily lives with dignity and joy, ultimately advancing civilization. People who are not well nourished do not have the energy to work or to learn and often need constant medical care. The cost is lost potential and increased health c costs.

Growing food and moving it from farm to fork involves several steps and many hands. The **food system** needs to be understo before students can grapple with the question, "Why does hunger exist?" In a highly efficient, modern agricultural system (like we have in the United States), the following steps take place during food production:

- Preparation (getting ready to grow)
- Growing
- Harvesting and transportation (moving food from the field)
- Storage
- Processing
- Distribution
- Preparing and consuming the food (at home or in a restaurant)

Many of these food production steps require transportation and an ample supply of energy (fuel and electricity). Each step also involves a great number of people, including bankers, agricultural suppliers, farmers and farm workers, truck drivers, food handlers, government inspectors, millers, bakers, and chefs. Weather conditions, energy price and availability, storage facilitie and transportation problems can all affect this food system.

In countries that are highly efficient and productive (the United States produces a surplus of food), a breakdown in the system can usually be fixed or dealt with quickly. However, developing countries don't always have the geography (climate or weather conditions), infrastructure (for transportation, storage, **food processing**, and distrubution), monetary system (many are poor or political system to move food effectively from farms to forks. These are some of the major reasons why hunger exists in the developing world. The reasons for hunger in the United States center more on poverty. Some people don't have enough money to purchase food. Poverty (beyond the scope of this lesson), affects millions of Americans. Working with local **food banks** is o way your students can help.

Interest Approach - Engagement

1. Ask students where we get our food. (If they say the grocery store, ask them where grocery stores get the food.)
2. Ask students to consider how many steps are involved in creating a frozen pepperoni pizza that can be purchased from a grocery store. Challenge them to list as many steps as they can think of. Explain that these steps are all part of our food system.

Procedures

Activity 1: The Food System Chain

1. Share the food production steps, and discuss what needs to happen at each step. Some prompting questions and possible answers may include:
   - Preparation (getting ready to grow food):
     - What does the farmer need to begin growing a crop? (*seeds, fertilizer, equipment, land*)
   - Growing the food:
     - What does the farmer need for the crop to grow? (*sunshine; rain; labor or hands to work, weed, and care for the crop; understanding of growing food; knowledge about land and agriculture*)
   - Harvesting and transportation (moving food from the field):
     - What is needed to harvest and transport the crop from the field? (*hands or laborers; mechanical harvesters; trucks, trains, ships, or airplanes; fuel; satisfactory/safe roads*)
     - Where is the crop moved after it is harvested from the field? (*some may be kept for personal use by the family, taken to local markets to be sold, or taken to a farmers' co-op, and some may be taken to processing factories or be held in a storage facility*) How far does the crop have to travel in each of these situations?
   - Storing the food:
     - How might the food be stored? (*by canning, freezing, drying, salting, or storing in a cellar or in a storage facility with controlled temperature*)
     - Where might the food be stored? (*grain elevators, refrigerators, large freezers, or other controlled environments*)
     - Is this the only step in which the food may be stored? (*no, food may also be stored after processing before it is distributed for purchase*)
   - Processing the food:
     - What might happen to a tomato crop at a food processing factory? (*if destined for ketchup, the tomatoes would be washed, heated, skinned, and smashed; the tomato smash would be mixed with salt and other spices to make ketchup; the ketchup would be bottled and labeled for distribution to a market*) What else could happen to a tomato crop? What about other crops?
   - Distribution:
     - How does a farmer sell a product? (*at a local farmer's market; directly to a local supermarket where individual negotiations are made; to a farmers' co-op where many farmers bring their products together to sell to a larger buyer*)

    - How is the crop resold to larger national or international markets? (*it could be sold through a large corporation or purchased by the government; it could be sold over the internet to an international buyer like a supermarket or processing plant*)
  - Preparing and consuming the food (at home or in a restaurant):
    - Discuss how people need money to buy food unless they grow their own.
    - Discuss how people must understand how to use the food safely and choose foods that keep them healthy.
2. Have students complete the *Who Makes Your Cereal?* activity sheet to get them thinking independently about food production.
3. Divide the class into groups of five. Give each group a copy (on different colors of paper) of the *Food System Chain* activity sheet. Ask students to cut apart the "links" and give one to each group member.
4. Ask them to think about the food production steps that you discussed and possible weaknesses that could occur in the system. Allow ten minutes for students to answer on a separate sheet of paper the "what if" question listed on their "link." Prompt them to answer in three to four complete sentences.
5. Once everyone is finished, have all the students with the same question get into a group together and discuss their responses.
6. Each group should now write one paragraph incorporating everyone's ideas and any new ones sparked by the discussion.
7. Each group should present their final paragraph to the class.
8. Ask students to regroup with the four other students who have "links" of the same color. Now regrouped, students should use a stapler to connect the links of their chain in the correct order.
9. Display chains and final paragraphs on a bulletin board titled "The Food System Chain is Only as Strong as its Weakest Link

Activity 2: Hunger

1. Share Peter Menzel's Hungry Planet Family Portraits (http://menzelphoto.photoshelter.com/gallery/Hungry-Planet-Family-Food-Portraits/G0000zmgWvU6SiKM/C0000k7JgEHhEq0w), which show families from around the world with what for them a week's worth of food. Discuss what the photos show about food systems in different countries. Consider the variety, quantity, and packaging of foods.
2. Display the *World Food Programme Hunger Map (https://docs.wfp.org/api/documents/WFP-0000118395/download/?_ga=2.178983012.1973992265.1600372985-1734913079.1561393944)*. Ask students to identify and write down the countries most severely affected by hunger. Ask the students to respond to the following questions concerning these areas:
   - Are there climatic or geographic similarities between these countries? How may the weather or insect populations affect the food supply?
   - Do these countries have stable governments? Is there war or civil unrest? Which links in the food system chain might this affect?
   - What can be done to help people overcome hunger or food insecurity in America? In the world?
3. Discuss with students what can and is being done to help address hunger issues locally and globally. What kinds of resource exist in your community for people who have difficulty purchasing enough food? Think about food banks, food pantries, sou kitchens, and community gardens. Discuss which links of the food system chain are strengthened by local efforts to fight hunger.

Concept Elaboration and Evaluation

After conducting these activities, review and summarize the following key concepts:

- A food system encompasses everything involved in producing food and getting that food to consumers.
- Modern food systems, like that of the United States, are highly efficient and complex.
- Food systems vary around the world, and where they are weak, people can suffer from hunger.

We welcome your feedback (https://usu.co1.qualtrics.com/jfe/form/SV_4HhIVpN4L8IC2lT)! Please take a minut to tell us how to make this lesson better or to give us a few gold stars!

Sources

1. http://www.usda.gov/documents/Briefing_on_the_Status_of_Rural_America_Low_Res_Cover_update_map.pdf
2. http://css.snre.umich.edu/sites/default/files/U.S._Food_System_Factsheet_CSS01-06.pdf
3. https://www.nrdc.org/food/files/wasted-food-ip.pdf

The *Background* section of this lesson is adapted from *Feeding Minds, Fighting Hunter: A World Free From Hunger (http://www.fao.org/documents/card/en/c/62708d0a-6134-5e44-b2ee-9034ab04e654/)* published by the United Nations Food and Agriculture Organization in 2001.

Suggested Companion Resources

- Processed Food Breakdown (https://agclassroom.org/matrix/resource/826/)
- Beatrice's Goat (https://agclassroom.org/matrix/resource/413/)
- I Am Farmer: Growing an Environmental Movement in Cameroon (https://agclassroom.org/matrix/resource/1059/)
- If the World Were a Village (https://agclassroom.org/matrix/resource/455/)
- Nory Ryan's Song (https://agclassroom.org/matrix/resource/456/)
- One Hen: How One Small Loan Made a Big Difference (https://agclassroom.org/matrix/resource/625/)
- Sparrow Girl (https://agclassroom.org/matrix/resource/985/)

- The Boy Who Harnessed the Wind (https://agclassroom.org/matrix/resource/959/)
- The Good Garden (https://agclassroom.org/matrix/resource/981/)
- The Hungry Planet (https://agclassroom.org/matrix/resource/72/)
- 40 Maps that Explain Food in America (https://agclassroom.org/matrix/resource/536/)
- Ag Census Web Maps (https://agclassroom.org/matrix/resource/856/)
- Animal Facts (https://agclassroom.org/matrix/resource/131/)
- Crop Intensity Maps (https://agclassroom.org/matrix/resource/966/)
- Feeding the World: Can global crop production meet future demands? (https://agclassroom.org/matrix/resource/891/)
- Interactive Map: Staple Food Crops of the World (https://agclassroom.org/matrix/resource/694/)
- Quiz: Can you name a food by looking at where it comes from? (https://agclassroom.org/matrix/resource/550/)
- World Hunger Map (https://agclassroom.org/matrix/resource/810/)
- America's Heartland: Maine-ly Apples (https://agclassroom.org/matrix/resource/663/)
- Can Science Create a 'Greener' Pickle? video (https://agclassroom.org/matrix/resource/491/)
- Eat Happy Project video series (https://agclassroom.org/matrix/resource/822/)
- Food Facts: 7 Reasons to Eat Insects (https://agclassroom.org/matrix/resource/961/)
- Food Machine (https://agclassroom.org/matrix/resource/475/)
- Growing Today for Tomorrow (https://agclassroom.org/matrix/resource/411/)
- How Farming Planted Seeds for the Internet (https://agclassroom.org/matrix/resource/594/)
- How to Feed the World in 2050: Actions in a Changing Climate video (https://agclassroom.org/matrix/resource/496/)
- Hungry Planet: What the World Eats (https://agclassroom.org/matrix/resource/558/)
- Planet Food Online Game (https://agclassroom.org/matrix/resource/736/)
- TEDMED Talk: What Does the World Eat? (https://agclassroom.org/matrix/resource/690/)
- Will the Last Farmer in America Please Turn Out the Light? video (https://agclassroom.org/matrix/resource/944/)
- FAO Statistical Pocketbook: World Food and Agriculture (https://agclassroom.org/matrix/resource/755/)
- Dirt to Dinner (https://agclassroom.org/matrix/resource/956/)
- FAOSTAT: Food and Agriculture Organization of the United Nations Statistics Division (https://agclassroom.org/matrix/resource/692/)
- Hungry Planet Family Food Portraits (https://agclassroom.org/matrix/resource/703/)
- National Geographic: What the World Eats (https://agclassroom.org/matrix/resource/574/)
- What's In My Food? (https://agclassroom.org/matrix/resource/652/)

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