INTRODUCTION

The Academy Award nominated documentary Food, Inc. provides an outstanding overview of many of the issues associated with modern industrial food production. These materials help focus viewing of the film on potential environmental impacts, and include both short and long answer questions that can be used with specific short segments of the film.

ESSENTIAL QUESTIONS

• How have food production practices changed over the past 100 years?
• What are the impacts of these changes on the health of consumers, farmers, farm animals and ecosystems?

OBJECTIVES

• Use the movie Food, Inc. to illuminate how the factory model of food production has become dominant.
• Use the movie Food, Inc. to illuminate impacts on the health of consumers, farmers, farm laborers, farm animals and the environment.
• Learn about innovations and alternatives to the current factory model of food production that can benefit the health of consumers, farmers, farm laborers, farm animals and the environment.

TEACHER NOTES

The Academy Award®-nominated documentary film Food, Inc. was released in 2009. The film documents modern methods of industrial farming which now dominate food production in the United States. The film features interviews with Michael Pollan, the author of The Omnivore's Dilemma, and Eric Schlosser the author of Fast Food Nation. Also featured in the film are Joel Salatin, a notable leader in promoting new farming methods and Gary Hirshberg, the founder of Stonyfield yogurt, one of the largest organic corporations in the United States.

For some time, the factory model of food production appeared to offer benefits such as increased volumes of food production. However, recently, some of this model’s hidden costs and unintended consequences have come to light. Some of these costs may be unfamiliar to the average consumer. The continued use of some of these practices has and will continue to have negative impacts on the health of farmers, consumers, animals and our ecosystems. Some of these practices negatively impact aquatic ecosystems. For example, excess fertilizer and manure may run off fields and feedlots directly into rivers and ultimately to the ocean. This load of nutrients can cause hypoxic dead zones in our oceans.

This set of film questions is intended to help students think about the hidden impacts and costs of modern day food production presented in the film, and to help students consider solutions to these unintended consequences.
The running time of the film is 94 minutes. It can be shown entirely during a couple of class periods. The Food, Inc. website (www.foodincmovie.com) contains background information and a detailed classroom discussion section for educators.

Another possibility is to show only sections of the film related to your curricular goals. Some of the film's 12 chapters contain material which may not relate to a specific class. This activity guide breaks Food, Inc. into thematic sections which contain material that aligns with the What's On Your Fork Action Guide.

The film has been divided into five sections around a related theme. Each film section lasts for 7-12 minutes and this guide contains a series of questions based on ideas presented in that section of film. It is recommended the teacher show the film in sections and discuss the student answers to the accompanying questions.

Each section contains two different question sets. The first question set is a series of short answer questions which students can answer based on an idea discussed in the film. The second question set contains extended response questions which could form the basis of a class discussion or a more substantial writing assignment. These questions can also be used in a class discussion. The teacher can conduct a short discussion based on the questions before showing the next section. Showing all five sections, with discussion, should take two full periods.

CONNECTIONS TO NATIONAL SCIENCE CONTENT STANDARDS GRADES 6-8

Life Science Content Standard C

Regulation and Behavior: Students will understand the importance of maintaining the internal regulating systems of cows and chickens and the consequences to these animals when these systems are altered.

Population and Ecosystems: Students will study the importance of biotic and abiotic factors to the health of ecosystems and the consequences to entire ecosystems when populations exceed the resources of that ecosystem.

Science in Personal and Social Perspectives Content Standard F

Personal and Community Health; Personal Health; Population, Resources, and Environments: Risks and Benefits are aspects of this standard that are explored throughout this activities' vignettes. Our agricultural systems bring us a vast bounty of food. However, some of our agricultural practices also cause unintended health consequences to farmers, their livestock and consumers. Additionally, one agricultural system can have a negative impact on another agricultural system. It is important that students learn the science along with the issues in order to be able affect innovative solutions to modern agriculture needs.

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SECTION 1: INTRODUCTION AND A HISTORY OF THE INDUSTRIAL FOOD MODEL

The process of growing, marketing and purchasing food has changed dramatically in the past 50 years. One of the driving factors was the growth of the fast food industry. This section examines the history of fast food and the ways it changed food production and farming practices.

Short Answer Questions

• How many products are in the average supermarket today?

  • McDonalds is one of the largest purchasers of which food items? Name three.

  • 80% of the beef market in the United States is controlled by how many corporations?

  • Chickens have been bred to produce more white meat. What is the cost or consequence for the chicken?

  • Antibiotics are commonly included in chicken feed at low does. Name a potential negative consequence for chicken health described in the film.

Extended Response Question

• Explain why you think the chicken farmer had to remove so many dead chickens each day.
SECTION 2: DEPENDENCE ON CORN

FILM CLIPS: CHAPTER 2 CORNICOPIA OF CHOICES (17:00 to 24:30) Total film time: 7.5 minutes.

This section discusses the industrial farming of corn and soybeans. Specifically, it addresses how corn is used to manufacture a number of artificial products like high fructose corn syrup and how corn replaced grass as food for most livestock raised in the US.

Short Answer Questions

• What percentage of the land in the United States is used to grow corn?

• What percentage of products on the supermarket shelves is estimated to contain a corn or soy bean product?

• List three ingredients found in processed foods that are manufactured from corn. Also, list three non-food items made from corn.

• How much meat does the average American eat in a year?

• What is the main component of food fed to animals in the United States?

• Cows have evolved to eat grass. List two reasons why we feed corn to cows in a feedlot rather than grass.

• Where did the scientist put his hand?

• What specific organism, harmful to humans, is found in the food in the cow's stomach?

• CAFO is the acronym for Concentrated Animal Feeding Operation. What factors in the CAFO feedlot may contribute to the spread of harmful bacteria?

Extended Response Question

• In the last generation, there has been a dramatic shift in meat production in the United States. Instead of pasture, most of our meat now comes from large industrial feedlots. Discuss one reason presented in the film which caused this shift in agriculture to occur.
SECTION 3: OTHER FARMING METHODS “THE POLYFACE FARM MODEL”

Joel Salatin is one of a breed of new meat producers who are not comfortable with industrial farming practices. Salatin’s Polyface Farm is based on minimizing the social and environmental problems associated with industrial farming and processing methods. Consequently, the meat produced on his farm is a little more expensive to the consumer.

Short Answer Questions

• At Polyface Farm, is meat production is based on grass or corn?

• Describe two ways grazing cows in a pasture benefits the farm/farmer.

• How is a pasture like a salad bowl?

• 50 years ago, Polyface Farm would have supported how many cows?

   Now it supports how many cows?

• Why is a pasture better than a plowed field in terms of global warming?

Extended Response Questions

• Describe some of the costs associated with feed-lot beef which Salatin does not have to pay for as a result of grazing his animals on a pasture.

• Significant costs associated with feedlot beef is based on oil while Salatin uses the concept of “solar dollars” to describe his farm. Explain what he means by this.
SECTION 4: CHALLENGES TO CHANGING THE INDUSTRIAL FARMING SYSTEM

It can be difficult to access information about how animals are raised, how employees are treated and which chemicals go into our food. The environmental impact of industrial agriculture is considerable and some people believe this type of agriculture is unsustainable. However, changing the system requires an educated population and effective government policies.

Short Answer Questions

• What are 3 examples of labels that the food industry has fought?

• Which celebrity was sued by the beef industry and for what reason?

• What can happen in Colorado if you publicly criticize beef?

Extended Response Question

• What are the possible costs and benefits of additional food labeling? Consider the industry, consumers, farmers and animals in your answer.
SECTION 5: SHOCKS TO THE SYSTEM AND THE BEGINNING OF CHANGE

FILM CLIPS: CHAPTER 10 SHOCKS TO THE SYSTEM (1:24:00 to 1:26:00) and SPECIAL FEATURE THERE IS NO PLACE CALLED AWAY (5:30 minutes) Total film time: 7.5 minutes.

This section discusses how the industrial farming system could reach a point of collapse and how organic farming methods are beginning to become mainstreamed.

Short Answer Questions

• Modern agriculture is heavily dependent on what substance?

• How many gallons of oil are needed to bring a steer to market?

• What happened to the river where Gary Hirshberg grew up?

• In the last 30 years we have increased pesticide use by a factor of 10 yet during this time the loss of food crops due to pests has ____________.

• What causes hypoxia in the Gulf of Mexico off the coast of New Orleans?

• What is missing in a hypoxic area that results in the death of marine life?

• Describe Gary Hirshberg’s method of making organic food less expensive.

Extended Response Question

• Explain how a farmer in Iowa, in the middle of the country, can impact an ocean.
SECTION I: INTRODUCTION AND A HISTORY OF THE INDUSTRIAL FOOD MODEL

Short Answer Questions

• How many products are in the average supermarket today? **47,000**

• McDonalds is one of the largest purchaser of which food items? Name three.
  Ground beef, potatoes, pork, chicken, apples, lettuce, tomatoes

• 80% of the beef market in the United States is controlled by how many corporations? **4**

• Chickens have been bred to produce more white meat. What is the cost or consequence for the chicken? **They have large breasts; bones and organs can no longer keep up with the overall growth of the chicken. In some cases the chickens can no longer walk.**

• Antibiotics are commonly included in chicken feed at low does. Name a potential negative consequence for chicken health described in the film. **Antibiotic resistance.**

Extended Response Question

• Explain why you think the chicken farmer had to remove so many dead chickens each day.
  **Chickens may be dying from disease, over-crowding, heat and/or inability to survive due to the physical limitations of their own bodies.**
SECTION 2: DEPENDENCE ON CORN

Short Answer Questions

- What percent of the land in the United States is used to grow corn? **30%**
- What percentage of products on the supermarket shelves is estimated to contain a corn or soy bean product? **90%**
- List three ingredients found in processed foods that are manufactured from corn. Also, list three non-food items made from corn. **High fructose corn syrup, maltodextrin, sorbic acid, xanthan gum and others. Non food items include batteries, charcoal, diapers, Motrin.**
- How much meat does the average American eat in a year? **Over 200 pounds per person**
- What is the main component of food fed to animals in the United States? **Corn**
- Cows have evolved to eat grass. List two reasons why we feed corn to cows in a feedlot rather than grass. **This is an inexpensive process that makes the cattle put on fat quickly.**
- Where did the scientist put his hand? **In one of the cow’s stomachs.**
- What specific organism, harmful to humans, is found in the cow’s stomach? **E coli bacteria**
- CAFO is the acronym for Concentrated Animal Feeding Operation. What factors in the CAFO feedlot contribute to the spread of harmful bacteria? **Standing in manure, a diet of corn, animals crowded together**

Extended Response Question

- In the last generation, there has been a dramatic shift in meat production in the United States. Instead of pasture, most of our meat now comes from large industrial feedlots. Discuss one reason presented in the film which caused this shift in agriculture to occur. **Cheapness, the drive to increase productivity, higher demand for meat, increased demand for fast food**
SECTION 3: OTHER FARMING METHODS “THE POLYFACE FARM MODEL”

Short Answer Questions
• At Polyface Farm, is meat production based on grass or corn? Grass
• Describe two ways cows in a pasture benefit the farm/farmer. They don't require purchased feed, their manure fertilizes the next crop of grasses, insects for chickens to eat “grow” in the manure.
• How is a pasture like a salad bowl? It contains a lot of different types of grasses, much as a salad contains lots of different vegetables.
• 50 years ago, Polyface Farm would have supported how many cows? 20
  Now it supports how many cows? 100
• Why is a pasture better than a plowed field in terms of global warming? A plowed field requires machines to plow it which burn oil and create greenhouse gas emissions, whereas a pasture does not.

Extended Response Questions
• Describe some of the costs associated with feed-lot beef which Salatin does not have to pay for as a result of grazing his animals on a pasture. Purchasing feed or antibiotics, disposing of manure
• Significant costs associated with feedlot beef is based on oil while Salatin uses the concept of “solar dollars” to describe his farm. Explain what he means by this. Industrial farming uses lots of oil. Salatin does not use the same amount of oil; rather than oil, photosynthesis is the basis of his farming operation.
SECTION 4: CHALLENGES TO CHANGING THE CURRENT SYSTEM

Short Answer Questions
• What are 3 examples of labels that the food industry has fought? Calorie information, removal of Trans fat content, labeling of genetically modified foods, country of origin labeling.
• Which celebrity was sued by the beef industry and for what reason? Oprah Winfrey was sued for publicly criticizing beef.
• What can happen in Colorado if you publicly criticize beef? It is a felony. You could go to prison.

Extended Response Question
• What are the possible costs and benefits of additional food labeling? Consider the industry, consumers, farmers and animals in your answer. Answers will vary.

SECTION 5: SHOCKS TO THE SYSTEM AND THE BEGINNING OF CHANGE

Short Answer Questions
• Modern agriculture is heavily dependent on what substance? Petroleum (oil)
• How many gallons of oil are needed to bring a steer to market? 75
• What happened to the river where Gary Hirshberg grew up? It caught on fire.
• In the last 30 years we have increased pesticide use by a factor of 10 yet during this time the loss of food crops due to pests has doubled. Doubled
• What causes hypoxia in the Gulf of Mexico off the coast of New Orleans? Agricultural run-off
• What is missing in a hypoxic area that results in the death of marine life? Oxygen
• Describe Gary Hirshberg’s method of making organic food less expensive. Making organic food less expensive by selling large amounts at places like Wal-Mart.

Extended Response Question
• Explain how a farmer in Iowa, in the middle of the country, can impact an ocean. The use of fertilizer and poor manure handling will enable both products to get into the Mississippi River watershed.