

Old MacDonald Had a CAFO?

- Is the industrial food system sustainable? Why or why not?
- What are some of the pros and cons of the industrial food system?
- What are some of the hidden costs of factory farming?



Image: Wikimedia Commons

Core Content Connections

Common Core Standards

Text Types and Purposes

W.CCR. 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

CCSS.ELA-Literacy.RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Integration of Knowledge and Ideas

CCSS.ELA-Literacy.RI.7.9 Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.

CCSS.ELA-Literacy.RI.8.9 Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.

Comprehension and Collaboration

CCSS.ELA-Literacy.SL.6.3 Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

CCSS.ELA-Literacy.SL.8.2 Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

“Get Big, or Get Out.”

Contrary to the popular image of the quaint and picturesque family farm: the red wooden barn, cows grazing in a grassy field and a farmer in overalls riding an old tractor, the center of our industrial food system is dominated by huge agri-businesses. “Old MacDonald” of the well-known children’s song could never compete today on a large scale with his “oink, oink here” and his “quack, quack there.” Today’s factory farms usually grow or raise only one thing, and lots of it – called a **monocrop**.

Many experts agree that we cannot provide enough food calories for billions of people without industrial farms. Yet this type of farming has detrimental effects on natural resources such as water and soil. What is the answer?

The famous words of former U.S. Secretary of Agriculture, Earl Butz, to American farmers during the 1970’s were, “Get big, or get out.” He was a proponent of industrial farming, with the justification that it would make food cheaper and more plentiful. America’s food supply would be secure. Has this goal been accomplished?

Introducing the Industrial Food System

Two very useful resources recommended for use to teach and learn about the industrial food system include Michael Pollan's book, "The Omnivore's Dilemma: The Secrets Behind What You Eat" (Young Readers Edition, 2009) and the documentary films "Food, Inc." (2008). An excerpt from "The Omnivore's Dilemma" describing an industrial potato farm is included in this unit.

As an opening activity, use a class discussion to determine students' existing awareness about food production, and then have students read and react to the following excerpt from Michael Pollan's book.

Discussion Intro:

Ask students to picture a farm. What does it look like? How big is it? Who works there? What kinds of plants and animals are being raised? What kinds of tools does the farmer use?

Have students turn and talk to share their ideas with a partner. (You might want to let students draw and/or write down their vision as well, depending on how much time you have for this activity.)

Let students share as a class and record/display their responses. Now ask students where the crops go that these farms produce. To a farmers market? The grocery store? A restaurant? A slaughterhouse or processing facility?

Then have a little fun...ask where the materials for specific foods come from. Start with the "easy" stuff and then move on to the more confusing items: Hamburgers? Tomatoes? Bagged lettuce? Frozen fish? Hot dogs? Spaghetti-O's®? Cheetos®? Skittles®? Twinkies®?

Once their interest has been piqued, it is a perfect time to read and respond to the excerpt from "The Omnivore's Dilemma." Next class session, view the documentary, "Food, Inc.," and start learning about the different places our food *really* comes from...

Key term: Agricultural subsidy – Tax dollars paid to farmers and large agribusinesses as additional income to allow the government to manage the cost and supply of specific crops. In the United States, corn growers receive the most federal assistance, resulting in an abundance of corn being grown and then sold at a low price. Other subsidized crops include soybeans, wheat, rice, sugar and cotton.

For a quick explanation of commodity crops and an overview of some of the pros and cons of farm subsidies: <http://www.hampdenparkcoop.com/node/904>

Excerpt from Omnivore's Dilemma

Michael Pollan is considered a leading authority on the American food industry. Read the excerpt below from the Young Reader's Edition of his book, "The Omnivore's Dilemma."

Before I began working on this book, I never gave much thought to where my food came from. I didn't spend much time worrying about what I should and shouldn't eat. Food came from the supermarket and as long as it tasted good, I ate it.

Until, that is, I had the chance to peer behind the curtain of the modern American food chain. This came in 1998. I was working on an article about genetically modified food – food created by changing plant DNA in the laboratory. My reporting took me to the Magic Valley

in Idaho, where most of the french fries you've ever eaten begin their life as Russet Burbank potatoes. There I visited a farm like no farm I'd ever seen or imagined.

It was fifteen thousand acres, divided into 135-acre crop circles. Each circle resembled the green face of a tremendous clock with a slowly rotating second hand. That sweeping second hand was the irrigation machine, a pipe more than a thousand feet long that delivered a steady rain of water, fertilizer, and pesticide to the potato plants. The whole farm was

managed from a bank of computer monitors in a control room. Sitting in that room, the farmer could, at the flick of a switch, douse his crops with water or whatever chemical he thought they needed.

One of these chemicals was a pesticide called Monitor, used to control bugs. The chemical was so toxic to the nervous system that no one is allowed in the field for five days after it is sprayed. Even if the irrigation machine breaks during that time, farmers won't send a worker out to fix it because the

"There I visited a farm like no farm I'd ever seen or imagined."

chemical is so dangerous. They'd rather let that whole 135-acre crop of potatoes dry up and die.

That wasn't all. During the growing season, some pesticides get inside the potato plant so that they will kill any bug that takes a bite.

But these pesticides mean people can't eat the potatoes while they're growing, either. After the harvest, the potatoes are stored for six months in a gigantic shed. Here the chemicals gradually fade until the potatoes are safe to eat. Only then they can be turned



into French fries.

That's how they grow potatoes?

I had no idea.

Discussion Prompts for “The Omnivore’s Dilemma” and “Food, Inc.”

Use the following discussion prompts for whole class and/or small group discussions, individual written responses, headings for written conversations or graffiti boards.

“The Omnivore’s Dilemma” Excerpt:

- 15,000 acres is roughly about 24 square miles. Do you consider an operation of this scale a farm or a factory? Explain.
- Workers are not allowed in fields for five days after pesticides are sprayed. Harvested potatoes must be stored for six months to allow pesticides to dissipate so they are safe for human consumption. What are your thoughts on the heavy use of toxic chemicals to grow food?
- What do you know about the Irish Potato Famine from 1845-1852? (If you don’t know much about it – time to do some research!) How could this relate?
- How is a farming setup like the author describes more cost effective than a small farm or a mixed crop farm?

[obesity-in-america.html](#) How does your region compare with other areas?

- Who do you think is responsible for the growing obesity problem in the U.S.? Who or what can be blamed for rising obesity rates among children and adults in the United States: U.S. food policy? Individuals? Parents? Fast food restaurants? Portion sizes? Sedentary lifestyles? Cultural norms? Advertising? Something else? Or is it a combination of factors?

In a small group or with a partner, determine who or what is responsible and why and then present your thinking to the rest of the class.

- Most agricultural subsidies are for crops such as corn, soybeans, wheat, rice, sugar and cotton. Why do you think this list does not include fresh fruits and vegetables? What about organic farming?

Food, Inc.

- In the film, we are introduced to the Gonzalez family. What are some of the factors that affect their food choices? Do you agree with their decisions? Why or why not?
- Learn more about obesity in your region, and the associated health costs: <http://www.getamericafit.org/statistics->

Read the following excerpt from Daniel Imhoff’s book, “Food Fight: The Citizen’s Guide to a Food and Farm Bill.” Does his viewpoint align with the information in “Food, Inc.?” Do you agree with his stance that farm subsidies should be redirected to food chains that produce locally grown foods instead of industrial farms? Why or why not? Do you think the author has a bias?

Excerpt from “Food Fight: The Citizen’s Guide to a Food and Farm Bill” by Daniel Imhoff

What about the Food Pyramid?

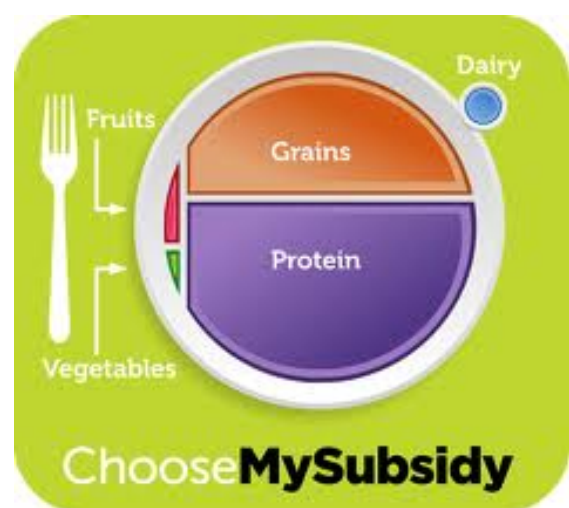
Very little of the agriculture we subsidize is directly edible, at least by humans. Out of the hundreds and even thousands of plant and animal species that have been cultivated for human use, the Farm Bill favors just four primary groups: food grains, feed grains, oilseeds, and upland cotton. Most are either fed to cattle in confinement or processed into oils, flours, starches, sugars, industrial food additives, and, increasingly biofuels.

It only takes a stroll down the supermarket aisles to understand how Farm Bill dollars flow into the country’s food chain. A dollar buys hundreds of more calories in the snack food, cereal, or soda aisles than it does in the produce section. Why? Because the Farm Bill favors the mega-production of corn (resulting in cheap high-fructose corn syrup) and soybeans rather than regional supplies of healthy vegetables, fruits, and nuts.

Unfortunately, eating a diet high in cheap calories doesn’t necessarily ensure that one is well-fed.

While the USDA’s Food Pyramid emphasizes the nutritional advantages of five daily servings of fruits and vegetables, Farm Bill funding for diversified row crop and orchard farming remains relatively disconnected from the balanced, healthy diet that professional nutritionists endorse. Meanwhile, most consumer food dollars spent in farm country end up leaving the region because our agricultural areas have effectively become “food deserts.” There is at least one simple solution to this. Farm and food subsidy programs could be realigned to support the federal dietary guidelines and reoriented toward food chains that produce and distribute locally grown, healthy foods.

Excerpted from *Food Fight: The Citizen's Guide to a Food and Farm Bill* by Daniel Imhoff, © 2007 Watershed Media, distributed by University of California Press.





Corn is King

Our industrial food chain is literally built around one plant: corn.

Michael Pollan dramatically describes the role of corn in The Omnivore's Dilemma:

“A food chain in nature helps us understand who eats what (or whom). But the food chain that feeds most Americans is anything but natural. The industrial food chain that supplies our supermarkets stretches thousands of miles and has dozens of different links. It's a chain powered by oil and gasoline and controlled by

giant corporations. It's a chain that separates us from our food and keeps us from knowing what it really is we're eating.

Most of all, it's a food chain built around one plant. Somehow, that small wild grass that started in the hills of Central America has become the star of the biggest, most expensive food chain in the history of the world. But if corn is the star of this story, is it the

hero or is it the bad guy?”

But is anything really that simple – can we really say that corn is either inherently “good” or “bad” in the role it plays in our food system?

Corn was not always the dominant crop in the United States. Up until about the 1930's, farmers were only able to get a yield of about 20 bushels (just a little bit bigger than the largest 50lb. bag of dog food you can buy at the store) per acre.

“Hybrid seeds allowed farmers nearly quadruple their crop yields.”

Farmers kept back a part of their crop to provide seed to plant for the following season. But that changed when seed companies came up with a new hybrid corn seed. A hybrid plant is one whose parents had different desirable traits, in this case

one type of corn that produced lots of ears per plant and another type of corn that was more disease resistant. The resulting hybrid is a disease-resistant plant that produces lots of ears of corn. Hybrid seeds allowed farmers to nearly quadruple



their crop yields up to eighty bushels per acre instead of twenty. Because hybrids can be planted very close together,



So if corn subsidies don't help the average farmer that much – who *do* they help?

Corn subsidies help farm suppliers, like seed companies and chemical companies that sell farmers pesticides, herbicides and fertilizer for their crops. Some companies, such as Monsanto, sell both.

Another beneficiary are feedlots, or CAFO's (Concentrated Animal Feeding Operations). It is cheaper to buy corn than to grow it, so farmers ship their beef cattle off to feedlots to be fed and fattened up for sale to slaughterhouses. Cheap animal feed translates to cheaper production costs for meat.

Another group that benefits greatly from corn subsidies are industries that make processed foods and fast food. Over the past several decades, food scientists have created hundreds of food ingredients and additives from corn. High fructose corn syrup is a less expensive alternative to cane sugar as a sweetener. Cheap ingredients allow processed food companies to make huge profits from products like soda, breakfast cereals and corn-based snack foods.

Corn is King- Continued

a farmer can plant thirty thousand corn plants per acre, instead of only eight thousand.

One downside to hybrid corn is that although the initial crop planted from hybrid seeds will exhibit all of the good traits as promised, the next generation of seeds harvested from that first crop will not. The seeds will have mixed genotypes, and a majority of the new seeds will not produce the same superior plants as in the original crop. So farmers have to buy a new batch of seeds from the seed company every year to maintain the same amount of corn yield as the year before.

The majority of farmers continue to be forced to buy new seeds each year as GMO corn now dominates the seed market. GMO corn is not selectively bred, but created in a lab by adding genes to corn from other organisms to make it disease, herbicide and even pesticide resistant. Every time a new variety of GMO corn seed is developed it can be patented by the corporation, such as Monsanto, that invented it. This means that not only do

farmers have to buy new seed each year to guarantee a maximum yield, they also have to buy new corn seed so they can't be accused of saving and reusing seeds – at the risk of being sued by a GMO corn company for patent infringement!

The effect of higher-yield corn was that more and more farmers grew more and more corn, in place of other crops. Hybrid and GMO corn crops didn't require as much human labor as the old-fashioned farms growing different kinds of crops, so it was initially more profitable. Small farms were no longer able to compete, and were sold off and consolidated into bigger and bigger farms, with less people working and living on them. This was the beginning of the industrial farm.

Just Add...Oil?

To really get the industrial food chain rolling, add large amounts of fertilizer, in the form of nitrogen, and oil to make the fuel to run tractors and other farm equipment, and to transport and process the corn into food products and animal feed.

Corn is King - continued

The end of World War II led to the creation of chemical fertilizers and pesticides for farming. Many large manufacturing plants existed in the United States that made ammonium nitrate for bombs and explosives for the war. Once the war was over, the government had a huge surplus of ammonium nitrate that it didn't know what to do with. Eventually, scientists with the Department of Agriculture came up with idea to spread ammonium nitrate on farmland as a fertilizer, since one of its main ingredients happened to be nitrogen.

Corn is a crop that depletes the nitrogen levels in soil after a few years, so it had to be periodically planted in rotation with other crops that replenished nitrogen, such as soybeans, every two years. Animals roamed the pasture eating grass, and their manure would act as natural fertilizer. Farmers would collect manure to spread on their fields to add nitrogen. It was a natural cycle, powered by the sun.

When chemical fertilizer became commercially available, farmers could grow corn continuously, year after year. As farmers started using chemical fertilizers during the 1950's the corn yield skyrocketed. They no longer needed to rotate crops, nor use animal manure as a natural fertilizer, so animals began to disappear from the pasture.

Vast amounts of fossil fuels are needed to manufacture chemical fertilizer. It is also used to make pesticides and herbicides. Petroleum fuels the farm equipment to plant, maintain and harvest corn crops, the trucks and trains to transport it and the processing plants that turn corn into a myriad of other food products.

Petroleum is another key to the industrial food chain, because we don't need mountains of corn sitting in and around corn elevators in Iowa – we need it on the road to feedlots and manufacturing plants! Without oil, our vast supply of corn would be worth next-to-nothing when a farmer brought it to market for sale.

Even now, corn sells for nearly half the money it costs to produce it. Yes, you read that right. It sells for far less than it actually costs farmers to grow it. How can that be? In order to encourage farmers to grow certain commodity crops (commodity crops are grown to be traded and are relatively nonperishable, storable and transportable), the U.S. government instituted a farm subsidy system under the Farm Bill. The Farm Bill covers a multitude of issues, but one component is a farm subsidy that basically pays farmers the difference between what it costs to produce corn and what the market will pay for it.

This program was designed to keep food cheap for consumers and plentiful for national food security. It has had many unintended negative consequences, however. Farmers are compensated by volume, so they naturally want to plant as much corn as possible, using extra fertilizer, pesticides and herbicides to maximize yields, which is not good for the environment. Many farms became monocultures, planting only one crop, causing food diversity to be lost, soil erosion to increase and water contamination from the overuse of chemicals. Small-scale farmers often struggle to make ends meet, and even many bigger farms earn very little profit. Large-scale, corporately owned agribusinesses are often the only types of "farms" that are able to thrive financially. Corn is sold overseas so cheaply it



Monsanto: Corporate Bad Guy or Media Scapegoat?

The more you learn about the industrial food production system in the United States, the more one corporation's name seems to come up: Monsanto.

Monsanto is the leading producer of genetically engineered seeds and the herbicide glyphosate, which it markets under the Roundup brand name. They focus a great deal of energy and financial resources on product development and new innovations. In the past, the company also manufactured several environmentally unsafe chemical such as insecticide DDT, PCBs and Agent Orange.

Monsanto's aggressive pursuit of biological patents and litigation of farmers over alleged misuse of patented GMO seed stock, political lobbying efforts and its history as a producer of highly toxic chemicals have made it a very controversial company. But is there more to the story? Do some research and decide for yourself. Think about how you can tell when information is biased, and strategies to determine fact from fiction.

Corn is King – continued

undermines the livelihoods of local farmers in other countries – even with transportation costs to get it there!

Farm subsidies help entities off of the farm as well. Trains transport corn to animal feedlots and industrial processing facilities non-stop. Because our country began producing so much excess corn, scientists at agricultural colleges and food companies began looking for new ways to use corn in food products. There are hundreds of corn-derived ingredients on the market today. Corn is used for vegetable oils, binding agents, thickening agents, meat filler, breeding, food coloring, cereals and corn syrups, just to name a few.

Corn has also replaced grass as the main feed for beef cattle. Cows are ruminants, their stomachs are designed to eat and digest grass, not corn. But corn is cheaper than hay and fattens the animals

up quicker, so it is more profitable in the short-term to feed animals corn instead of their natural diet.

Since cows were not designed to eat corn, it causes them a variety of health disorders. Cows in CAFO's are also kept in very crowded conditions, often standing ankle-deep in their own manure, an environment perfect for the rapid spread of disease. Cows must be constantly medicated with antibiotics to keep them from getting sick. Over 80% of antibiotics used in the U.S. are for livestock – not people! So, pharmaceutical companies benefit from corn subsidies as well.

This is only part of the complex story of corn and the industrial food system. But one thing is for sure in this country– corn is king of the agricultural hill.

The Industrial Food System – Taking It a Step Further

Explore the Industrial Food Chain

Do you enjoy the process of analysis and systems thinking? Delve deeper into the complex web of our industrial food system!

- How does our industrial food system work and what are some of its pros and cons?
- What are some of the hidden costs of factory farming that don't show up in the price of food at the checkout line?
- How do farm subsidies actually work and who benefits from them?
- What kind of lobbying efforts go on in Washington to influence food and farm legislation?
- How do patents of GMO seeds work? What ramifications has this had on the farming industry?
- Humans naturally crave sweet, salty and fatty foods. How do food manufacturers capitalize on this biological fact?
- What are the connections between the Farm Bill, the food stamp program and school lunches? Yes, there's a connection...

Who Me – Biased?

“There are two ways of lying. One, not telling the truth and the other, making up statistics.”

The topic of industrial farming elicits very strong opinions from different stakeholders. As an educated consumer of information, you have to be mindful of this as you read, listen to a speaker or watch a documentary video.

- Did you detect any bias while watching Food, Inc.? What made you think the information might be biased? How can you find out what is really true or not?
- Who are some of the different stakeholders involved in food production (This includes you – you eat food!) and what are their viewpoints on industrial farming? Explain. Share your thoughts in a cartoon storyboard, as a play or skit, a mock interview or newscast, or another form of presentation.

Is There Simply No “Simple Truth?”

Let's get all deep and philosophical – it can be so much fun!

Perspectivism is the philosophical view developed by Friedrich Nietzsche that all ideations take place from particular perspectives. This means that there are many possible perspectives in which judgment of truth or value can be made. This is often taken to imply that no way of seeing the world can be taken as definitively "true", but it does *not* necessarily mean that all perspectives are equally valid.

How does Nietzsche's idea of perspectivism play out in relation to feeding the world? Write an essay and share your thoughts or plan out a debate with a partner or small group of fellow intellectuals to perform for your class.