Obesity. That's what seems to be on the forefront of most American minds when they talk about the food system. What about the other issues lurking through the cornfields? There's much more to food production than meets the eye. People think they're buying meat from a farm where cows graze out in an open pasture or the pigs freely roll in mud baths all day long. We have been trained to look at calorie counts and to watch how many grams of sodium we eat per day. We need to take a step back and look at the bigger picture, not the bigger people. It's time to fill in the missing link that most consumers don't realize is gone – the link that explains why there are growing numbers of brain tumors, organ failures, cancer, the list goes on.

To understand the basic facts of what's going on, it's beneficial to have an overview of the current situation. In 1970, the top five beef businesses – John Morrell, Swift, MBPXL, IBP, and Armour – controlled 25% of the market. Today, the top four – Tyson, Swift, Cargill and National Beef – control more than a whopping 80% of the market.[1] Along with the meat packing industry being controlled by a limited number of companies, agricultural business is also being dominated. Corn is the leading crop grown in the United States. Over 80 million acres of land is planted with corn. "Corn has muscled out most of the other plants and animals," too, including "sheep, chickens, pigs, fruits and vegetables." Since monoculture[2] makes farming easier, the crop has pushed away millions of farmers. Monoculture allows farmers to purchase machinery that specializes in farming the one type of crop they are growing. The machinery also helps farmers cover more land than when the farmers worked by hand, and therefore leads to a single farmer owning more land; the other farmers who previously owned that land and who don't farm using the monoculture technique are run out of business. There used to be 300 million farmers in the United States and now there are just two million.[3] On top of the decline in farmers, they are always in debt. The average chicken house ranges from $200,000 to $350,000. After a chicken farmer puts an initial investment into their chicken houses, the company for which they are raising chickens demands that the farmer upgrade their houses and buy new equipment. Carole Morison, chicken farmer for Perdue, says that the farmer has to oblige otherwise the company threatens with lawsuits. "It keeps them in control." It keeps the farmer going to the bank for loans and spending money. "A typical grower with two chicken houses has borrowed over $500,000 yet only earns about $18,000 a year." It's an endless black hole of debt for farmers.[4]

What happened to the other crops? That's an easy answer. Other crops can't be taken to the labs and turned into all the other food found in the supermarket. That's why America heavily depends on corn. Corn is in Dr. Pepper, Pepsi, Poptarts, Tostitos, Cheetos, Doritos, Oreos, Cheeze-Its, Wonder Bread, Hershey's chocolate, the list is endless. Corn also satisfies the CEOs of big factory farms because it helps animals become fatter faster to create more meat for the consumers. To ensure this supply and

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[1] *Food, Inc.* Dir. Robert Kenner. Magnolia Pictures, Participant Media, River Road Entertainment, 2008. DVD.

[2] Monoculture – the growing of one kind of crop over and over on the same soil.

[3] Chevat, Richie, and Michael Pollan. *The Young Readers Edition: Omnivore's Dilemma: The Secrets Behind What You Eat*. New York: Dial, 2009. Print.

[4] *Food, Inc.* Dir. Robert Kenner.

demand effect by reducing labor in the fields, Monsanto, an agricultural biotechnology corporation, took the initiative to push farming to a whole new level.

Monsanto changed the world by taking seeds from the field, putting them in a Petri dish, and inserting genes from other organisms to alter the DNA of the seed, essentially creating a super-seed. After altering the natural state of the seed, Monsanto created a series of pesticides and herbicides that farmers could spray over their genetically modified (GM) crops. By having these GM crops, farmers wouldn't have to worry about the pesticides and herbicides killing the crops because part of the genetic modification was creating them to be resistant to pesticides and herbicides.

In an ideal world, this concept is a major breakthrough. However, we do not live in an ideal world. There's always something going wrong and this is one of those times. It seems that pesticides and herbicides should be fine—they're just there to kill pests and weeds—but there are unintended consequences that result from all the chemicals used in these so-called solutions. Some chemicals found in Monsanto's Round Up® include: arsenic, atrazine, endosulfan, glyphosate, heptachlorine, hexachlorocyclohexane, and many more.[5,6]

These chemicals are not only hazardous for people in the United States, but anywhere in the world that Monsanto is pushing their product to be used. In Argentina, Sofia Gatica, a protester against Monsanto, "started seeing children with mouth covers, mothers with scarves wrapped around their heads to cover their baldness, due to chemotherapy." Her three-day-old daughter died from kidney failure and suspicions link to the chemicals being sprayed aerially "allowing them to drift wherever the wind or water will take them," sometimes to homes that are "less than five yards from where the fields start." Gatica started a movement and research plan. She found out that citizens in this area had "high rates of neurological and respiratory disease, birth defects and infant mortality, and cancer rates 41 times the national average." Maybe that's what's causing similar issues in the United States; just no one has put much attention to the effects of the chemicals.[7]

There have been plenty of studies about the effect of processed foods on our body. Look at *Super Size Me*, *Forks Over Knives*, *Food Fight, Killer At Large,* and more – all these documentaries are about our cholesterol, the statistics about obesity, and the health effects of eating food with no nutrients and all fat. America is starting to open their eyes about the obesity epidemic, but there is still little research about the chemicals used before it reaches the factories. Some of the few studies have been linked to one of the most dangerous agribusiness chemicals – atrazine. Atrazine is found in pesticides and has been banned in the EU due to its hazardous consequences. Studies have shown that atrazine causes demasuclinization resulting in feminization of frogs, producing hermaphroditic frogs. Atrazine has also shown to cause to low sperm count, prostate

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[5] Cernansky, Rachel. "The Mother Who Stood up to Monsanto In Argentina." *Grist*. Grist Magazine, Inc., 17 Apr. 2012. Web. 23 Apr. 2012. <http://grist.org/industrial-agriculture/the-mother-who-stood-up-to-monsanto-in-argentina/>.

[6] "Atrazine: Poisoning the Well." *Natural Resources Defense Council – The Earth's Best Defense*. Natural Resources Defense Council. Web. 29 Apr. 2012. <http://www.nrdc.org/health/atrazine/>.

[7] Cernansky, Rachel. "The Mother Who Stood up to Monsanto In Argentina."

cancer and breast cancer in rodents, which can also happen in humans. 70 million pounds of atrazine are used a year in the United States where it continues to contaminate waters – the chemical can even be found 600 miles from the source.[8] If it's that dangerous of a chemical for a whole nation to ban, why is it still being used in the United States?

And we shouldn't just be worrying about the health effects of *our* population. We need to worry about the condition of the Earth, too. We only have one Earth. The more we contaminate it, the more it breaks. Farmers tend to put down a lot of extra fertilizer "to play it safe."[9] Fertilizer is a farming technique that helps crops grow by adding lots of chemicals and nutrients to the soil in an inorganic way. It generally has a lot of nitrogen in it. Too much nitrogen is bad for the soil. George Naylor, a corn farmer in Iowa, speaks about how farmers generally need about a hundred pounds per acre, but he puts more around 180 pounds. "It's a form of yield insurance"[10] to him. The crops can only absorb so much fertilizer, so where does the rest of it go? There are lots of places the toxic chemical reaches. Some evaporates causing acid rain. Other parts turn into nitrous oxide gas, which plays a part in global warming. Some of it absorbs into the soil, reaching to the groundwater and contaminating the water system. The rest is washed away by the rainwater and transported into drainage ditches. This contaminated run-off then spills into rivers, which flow into the ocean. Therefore, using these chemicals in the middle of the country ends up contaminating the ocean. Once in the ocean, the extra nitrogen from the chemicals stimulates massive algal growth and the algae steals all the oxygen in the water, which in turn kills the fish. This creates a hypoxic zone[11] in the Gulf of Mexico as big as New Jersey and continuing to grow larger.[12]

Not only are our current farming practices contributing to the overabundance of pollution in our air and water, the way farmers are cultivating their crops is bad for the soil. Every year, five to seven million hectares of agricultural land becomes invaluable due to soil degradation. Causes of soil degradation are salting, water logging, compaction, pesticide contamination, decline in the quality of soil structure, loss of fertility, and erosion by wind and water. 25,000 million tons of topsoil is washed away per year due to erosion. "Intensive tillage, combined with monoculture and short rotations, leaves the soil exposed to the erosive effects of wind and rain. The soil lost through this process is rich in organic matter, the most valuable soil component."[13] Due to soil loss, farmers start piling synthetic fertilizers on the land. Though the fertilizers help temporarily, they don't fix the damage that's being done. It's just prolonging the end

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[8] "EU on Atrazine." Interview by Steve Curwood. *Living on Earth*. World Media Foundation, 21 Apr. 2006. Web. 06 May 2012. <http://www.loe.org/shows/segments.html?programID=06-P13-00016>.

[9] Chevat, Richie, and Michael Pollan. *The Young Readers Edition: Omnivore's Dilemma: The Secrets Behind What You Eat*.

[10] Chevat, Richie, and Michael Pollan. *The Young Readers Edition: Omnivore's Dilemma: The Secrets Behind What You Eat*.

[11] Hypoxic zone = a "dead" zone.

[12] Chevat, Richie, and Michael Pollan. *The Young Readers Edition: Omnivore's Dilemma: The Secrets Behind What You Eat*.

[13] Gliessman, Stephen R. *Agroecology: The Ecology of Sustainable Food Systems*. Boca Raton: CRC, 2007. Print.

of the farming era. Eventually, all the soil will become so degraded that it will be impossible to fix and by that time, we won't need fertilizers. We won't need them because our population will become so overwhelmingly large that food will be grown in test tubes inside buildings with faux sunlight. The food system will move from outdoors to indoors leaving useless soil to be turned into cement jungles of the blossoming cityscape lifestyle. "Current agricultural practices must undergo a vast change if the precious soil resources we have remaining are to be conserved for the future."[14]

Increased usage of pesticides and herbicides on monoculture are quite disastrous combinations. Firstly, having a monoculture is dangerous. If there is a disease that affects the crop used in the monoculture, the farmer has lost every single crop versus when there is crop diversity, there is still hope for the other crops. Secondly, farmers are using the same chemicals to kill pests and weeds over and over again on their monoculture. Pests and weeds then build up a resistance to the chemicals creating "super pests" and "super weeds." When that happens, it forces the farmers to spray more and more chemicals on the land. Then the pests and weeds become immune to *those* chemicals and it's a vicious cycle that needs to end.[15]

So how are we supposed to control pests? And weeds? And feed America without these chemicals? It's not difficult, it just takes patience, willingness to work, and more commitment. Pesticides and herbicides are unnecessary. With crop rotation, pests won't be a bother and using woodchips can cut back on weeds.[16] Bob Cannard, an organic, sustainable farmer at Green String Farms in California, has found perfect ways to help feed America while keeping us safe. He doesn't believe in fertilizer and pesticides. He uses compost to "fertilize" the soil, which gives all the necessary ingredients to the crops. He also believes in using volcanic rock dust because it's very high in important nutrients. With this care, his crops are very healthy and can naturally keep away pests. Cannard explains it like this: plants are like humans. If we're healthy, we can fight off diseases. If we're sick, we're more prone to diseases. If the plants are healthy, they can fight off pests. The same thing applies to weeds. And when the plants are healthy, the use of pesticides becomes obsolete.

We also don't need huge agribusiness farms. If we have lots of community gardens and local farms, like Joel Salatin, a closed loop[17] farmer in West Virginia, we'll be eating healthier – for our bodies and the environment – along with helping more people with jobs (working on the farm). I see Salatin as the best kind of farmer. He allows his cows to roam freely in pasture eating whatever grass they want. He lets the manure naturally replenish the nutrients in the ground versus harming the ground with toxic fertilizers. He also records "cow days" – the average amount of forage a cow will eat in one day – an important calculation allowing the farmer to know when to move the

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[14] Gliessman, Stephen R. *Agroecology: The Ecology of Sustainable Food Systems*.
[15] Chevat, Richie, and Michael Pollan. *The Young Readers Edition: Omnivore's Dilemma: The Secrets Behind What You Eat*.
[16] "Organic Farming and Food." *English-Online Articles in Easy, Understandable English for Learners*. Web. 06 May 2012. <http://www.english-online.at/biology/organic-farming/organic-food-and-farming-methods.htm>.
[17] Closed loop – where everything needed to help the soil and to help farm exists on the farm. Current farming practices rely on outside resources to fuel the farm.

cows to another part of the pasture. At Salatin's farm, Polyface Farms, he has managed as many as 400 cow days per acre where the county average is 70. Closed loop farming is possible; it just takes a lot more work. There are a lot of variables and if the farmer doesn't pay close attention, it doesn't work. This system has the added benefit that the cows aren't grazing in manure all day, keeping his animals away from parasite contamination in their bodies, which would one day end up in *our* bodies. Thanks to the tractor and the plow used in industrialized farming, one-third of greenhouse gases are produced from those machines working on all the cornfields in the United States. "If the 16 million acres now being used to grow corn to feed cows in the United States became well-managed pasture, that would remove 14 billion pounds of carbon from the atmosphere each year, the equivalent of taking 4 million cars off the road."[18]

We can't just sit around and watch as our loved ones die from environmental toxicity or watch the natural world diminish in front of our eyes. We have to do something. People are like sheep. If one person starts a movement, the rest will follow. If everyone joins in on the movement, we can collectively change our food system. If nothing changes, who knows, another Dust Bowl might occur. They didn't have good farming practices back then, and we certainly don't have them now. All these chemicals are killing our Earth and killing us. Internet resources can tell you what farmer's markets are close to you and what local farms are nearby. Joining the movement on labeling foods that contain GMOs helps take off the rose-colored glasses in grocery stores. Currently, in my hometown of Cincinnati, there are local community gardens, a farmer's market in the parking lot of a restaurant during the summer, and a historic farmer's market in our downtown. There are plenty of local farmers in Cincinnati, it's just all about getting their name out there so more people are aware of what's available to them. Educating yourself on the effects of these chemicals is important. It's not hard to change. It takes an open mind and effort. I believe anyone can do it.

To help get started, visit:

http://www.sustainabletable.org/issues/ - this website helps educate about the basis of what's happening in our food system today.

http://localharvest.com/ - this website helps locate local farmer's markets and sustainable farms near you.

[18] Pollan, Michael. *The Omnivore's Dilemma: A Natural History of Four Meals*. New York: Penguin Books, 2006. Print.

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