

Impacts of Industrial Agriculture/CAFOs & the Future of Sustainable Agriculture

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A century since the industrial revolution, human beings have become immersed within technological forms: cities, factories, high-speed transport, electronic media, as well as industrial practices in forestry, aquaculture, and agriculture. Where humans once coevolved with the natural world, that world is increasingly absent from our experience and awareness. We slowly merge with the machine even in the way we think. In such a confined context, notion of sustainability begin to lose their roots in nature, and themselves become industrial expressions.¹

Over the past 50 years, America has seen a replacement of small independent farms with large-scale industrial agriculture operations. A nation of family farmers with a strong connection to their land has been replaced by giant agribusiness, which has arguably no connection to the surrounding land, the local people, and the regional environment. Industrial agriculture operations strive to increase productivity and maximize profits through the use of technology. They have transformed fields of diverse crops into huge plots of monocultures and have replaced farm-raised animals with factory farms. This type of un-sustainable agriculture has caused a number of negative side effects on humans, the environment, and the rural economy. These effects include “soil erosion, contaminated groundwater, food-borne illnesses, loss of biodiversity, inequitable social consequences, toxic chemicals in food and fiber, loss of beauty, loss of species and wildlife habitat, and a myriad of other environmental and social problems.”²

Industrial agriculture has also created a distance between the consumer and food production. As a consequence, the general public is disconnected, both “physically and psychologically” from the environmental and social impacts of food production.³ As urban areas grow, it is increasingly important that urban and suburban dwellers understand the “sources and origins of their food” in order to make informed choices.⁴

This essay will discuss the environmental and social impacts of factory farms, the alternatives to factory farms, and the challenges for sustainable agriculture in the future.

I. Impacts of Factory Farms

Factory farms, also known as “concentrated animal feeding operations” (CAFOs), are



currently the main meat producers in the country. Created to increase efficiency and volume and maximize profits, CAFOs supply millions of pounds of meat to Americans. In order to create such high volume, in a given CAFO thousands of

cows, pigs, chickens and turkeys live in confined areas, are fed grain mechanically, and are provided little to no access to natural sunlight, fresh air, or room to move around.⁵ As a result, the conditions can be unsanitary so animals typically receive antibiotics to ward off disease and illness and/or hormones to promote faster growth. With thousands of animals living in one space, millions of gallons of raw manure is created and stored in huge “lagoons” or cesspools onsite.

Although on the surface it may seem that factory farms are necessary to feed a nation of nearly 300 million people, however a little investigation will show that the costs of running such operations far outweigh the benefits of mass producing cheap food. The externalities that consumers do not see reflected in their food prices are: environmental pollution and public health risks, animal welfare impacts, and rural community impacts.

Environment & Public Health

Because CAFOs house large numbers of animals on a small piece of land, the management of excrement from the animals is a huge problem. According to the EPA, one hog alone can excrete up to 17.5 pounds of manure and urine each day. On a factory farm with 35,000 hogs, over 4 million pounds of feces and urine are produced each week. That amounts to over 200 million pounds of waste each year – on only one farm.⁶

Typically, raw manure is mixed with water and is contained in open lagoons. It is then spread or sprayed onto fields as fertilizer. Unfortunately, the common problem with this process of waste management is that there is too much manure and not enough land to fertilize. As a result, manure is often over-applied on land leading to run-off that contaminates groundwater and/or surface waters.



In addition, lagoons have been found to leach into groundwater and/or spill over into surface waters after heavy rainstorms. Because the manure is untreated, effected water is contaminated with bacteria and pathogens that can cause serious health effects in humans and wildlife.

Air pollution from lagoons: Decomposing manure in lagoons releases over 400 volatile organic compounds, including nitrogen, hydrogen sulfide and methane into the

atmosphere.⁷ These gases produce strong unpleasant odors that can cause ailments, decrease the basic quality of life, and have been shown to reduce property values for people living near CAFOs. A study conducted by the University of North Carolina reported that “people living near large hog farms suffer significantly higher levels of upper respiratory and gastrointestinal ailments than people living near large cattle farms or in non-livestock areas.”⁸ The Duke University Swine Odor Task Force also found that the gases emitted by hog farms have been detected four miles downwind, yet are as intense in odor as if coming from the lagoon itself.⁹

Water pollution from lagoons: Because livestock creates 2.7 trillion pounds of manure every year¹⁰, groundwater and surface waters are at risk of contamination from Nitrogen, Phosphorus, pathogens, and heavy metals when lagoons leach, spill, leak, or create run-off. According to the EPA, hog, chicken and cattle waste has polluted 35,000 miles of rivers in 22 states and contaminated groundwater in 17 states.¹¹ Contamination kills fish, degrades wildlife habitat, and threatens drinking water supplies.¹²

Blooms of toxic organisms, such as *Pfiesteria piscicida*, occur in nutrient-rich water (from nitrogen and phosphorous), and have led to the death of billions of fish in the tributaries of the Chesapeake Bay. Animal manure has contributed in creating the dead zone found at the mouth of the Mississippi River in the Gulf of Mexico.¹³

Cryptosporidium, *Campylobacter*, *Escherichia coli* (*E. coli*), and *Salmonella* are all pathogens found in water contaminated with animal manure that can cause illnesses in humans.¹⁴ Human consumption of nitrates, a form of nitrogen, in water can result in the “blue baby syndrome,” which harms infants by reducing the amount of oxygen carried by blood.

Antibiotics: Due to the unsanitary conditions of CAFOs, disease and illness is more rampant. To offset this problem, antibiotics are commonly fed to livestock living in these conditions. According to the Union of Concerned Scientists, 70% of the antibiotics produced in the U.S. every year, 25 million pounds, are fed to livestock.¹⁵ There is serious concern among scientists and the general public that the residues of the antibiotics can end up in the meat people eat and that the heavy use of antibiotics can make bacteria resistant to drugs—making it more difficult to treat humans and animals.

Animal Welfare

Due to the constraining environment of the farm factories, animals live in extremely stressful situations. Chickens are normally packed tightly in cages that are stacked one on top of another. Pigs are found in confined spaces with no space to nest. Cows are found stuck in stalls and not allowed to graze the land. Routine beak trimmings of chickens and tail dockings of pigs are conducted to prevent chickens and pigs from pecking and biting one another—an issue common to confined living conditions such as these.¹⁶

Community Impacts

The growth of agribusiness has resulted in the decline of smaller family-operated farms that tend to use more environmentally-friendly agriculture practices. According to the advocacy organization, Farm Aid, small family farmers have been pushed off their land by giant factory farms in large numbers. Since the 1930s, there are 5 million fewer farms in U.S. Of the remaining 2 million farms, only 565,000 are currently family-run.¹⁷

Factory farms claim that they are beneficial to rural communities because they will provide jobs and promote economic growth. Unfortunately this is not the case, according to a report by The Global Resource Action Center for the Environment (GRACE). The report discusses that CAFOs typically do not promote job growth mainly because they employ as few people as possible in order to keep costs low. Additionally, the jobs offered tend to be hazardous due to the pollutants and toxicants released by the farms. The report also found that economic growth is low because CAFOs tend not to spend money locally. Supplies and materials are mostly imported from the cheapest sources, which often times are not local.¹⁸ Additionally, the air, water, and land pollution, and foul odors from the farms all contribute to the decline in property values and tax base for local residents.

Although CAFOs try to improve efficiency to bring consumers a low priced product, attempt to provide jobs, and claim to promote economic growth, in reality the general public pays for expensive environmental costs, health costs, and community costs through taxes, decreases in property values, and medical bills, which are estimated to be in the billions.¹⁹ Alternatives to industrial agriculture are necessary.

II. Alternatives to Industrial Agriculture: Sustainable Agriculture

Sustainable agriculture, typically practiced on small independent farms, is a type of farming that respects and nurtures that land, environment, community and animals and is a viable alternative to industrial agriculture. The USDA has reported that these farms provide great public value.²⁰

Environment & Public Health

One of key advantages of small farms is that they tend to use varied techniques of farming and integrating plant and animal production, such as intercropping and crop rotations. These techniques promote and preserve biodiversity and provide natural pest and disease control without the heavy use of fertilizer, pesticides, and other harmful chemicals. Animals on farms such as these are not confined to cages and stalls and they experience a much healthier, less stressful, and more humane life. Farm animals are mostly antibiotic and hormone-free and furthermore animals are allowed to behave naturally in the environment. Large amounts of waste are not created when there are fewer animals on a piece of land and when animals can naturally fertilize the land (no manure lagoons). This type of farming yields benefits for the air, water, soil, wildlife habitat and human health.



Community Impacts

Community members and families benefit from small farms. Local businesses provide services and are employed on these farms, unlike factory farms that tend to employ few and import goods and services from cheaper locations. More community involvement is also a result of small farms, where children can learn about food. A report by the Institute for Food and Development Policy, a non-profit research and advocacy organization, found that more local businesses, higher employment, infrastructure and civic institutions are found in communities dominated by family farms.²¹

Small farms provide a deeper and closer connection to consumers about the sources and origins of their food. When that connection is established, consumers have more appreciation for food production, something that has been lost with the onset of industrial agriculture and supermarkets. Farmers markets, community-supported agriculture (CSAs), and farmer cooperatives, are all meaningful ways in which urban, suburban, and rural communities can support sustainable agriculture. Farmers markets actually have experienced growth in the U.S. According to USDA, between 1994 and 2000, the number of U.S. farmers markets increased by 63%, from 1,755 to 2,863.²²

As urban areas continue to grow, a market for urban sustainable agriculture is increasingly apparent as another alternative. Small urban farms can provide a number of benefits including reductions in energy costs and less pollution from transportation, storage, and packaging reductions²³.

However, there are a number of challenges for sustainable agriculture on small, independent farms or on urban farms to make it into the mainstream.

III. Conclusion: Challenges Ahead

The main challenge for a small independent farmer is to make a profit. Sustainable agriculture is more labor intensive and does not “yield” as much as industrial agriculture due to economies of scale—industrial farms have much more land area than small farms. Competing with commercial farming is extremely difficult for small farmers, and has led to farmers working under contract with the agribusiness, or expanding their own farms and specializing, or just leaving the business entirely.

Another challenge for small farmers to stay in business is that there is consumer demand for industrial agriculture products. The convenience that modern day supermarkets have brought to our society is a huge benefit. It is a reality that it is an inconvenience for most people to find farmers markets and utilize them. Furthermore, food from sustainable farms can be more expensive than mass produced food.

To overcome these challenges, government policies that help small independent farmers are essential for their survival. Also, making federal and state laws that place more restrictions on corporate involvement in agriculture (such as animal treatment) and

that strictly regulate waste management, air pollution, water pollution, and odors from factory farms will help level the playing field.²⁴

Farmers markets and CSAs need to market themselves more to the public. Grocery stores such as “Whole Foods Market,” are helping sustainable farmers by selling their food. Marketing the environmental, health, and community benefits of sustainable agriculture will help because people are increasingly becoming more concerned with these issues. Educating the public about the issues surrounding industrial agriculture and the alternatives to it is a step in right direction. By making sustainable agriculture more accessible and appealing through individual and collective efforts, the potential to be less dependent on meat and food from industrial farms increasing, thereby promoting a more sustainable society.

¹ Andrew Kimbrell, Fatal Harvest (Washington: Foundation for Deep Ecology & Island Press, 2002) 17.

² Kimbrell, xi.

³ Kimbrell, 1.

⁴ Kimbrell, 1.

⁵ Factory Farm Project. (<http://www.factoryfarm.org/whatis/1.php/>)

⁶ Sustainable Table: Environment. (<http://www.sustainabletable.org/issues/environment/>)

⁷ Sustainable Table: Environment. (<http://www.sustainabletable.org/issues/environment/>)

⁸ Sierra Club: Air Pollution. (<http://www.sierraclub.org/factoryfarms/factsheets/air.asp>)

⁹ Factory Farm Project. (http://www.factoryfarm.org/docs/AIR_POLLUTION_FACTS.doc)

¹⁰ Sierra Club. (<http://www.sierraclub.org/factoryfarms/factsheets/factoryfarms.asp>)

¹¹ Sierra Club. (<http://www.sierraclub.org/factoryfarms/factsheets/factoryfarms.asp>)

¹² Sustainable Table. (<http://www.sustainabletable.org/issues/environment/>)

¹³ Sierra Club. (<http://www.sierraclub.org/factoryfarms/factsheets/factoryfarms.asp>)

¹⁴ Concentrated Animal Feeding Operations. Water Quality Section.

¹⁵ Sierra Club. (<http://www.sierraclub.org/factoryfarms/factsheets/antibiotics.asp>)

¹⁶ Farm Animals.

¹⁷ Farm Aid. (http://www.farmaid.org/site/PageServer?pagename=info_facts_help)

¹⁸ Factory Farm Project. (http://www.factoryfarm.org/docs/Foundations_of_Sand.pdf)

¹⁹ Sustainable Table. (<http://www.sustainabletable.org>)

²⁰ Food First/Institute for Food and Development Policy. (<http://www.foodfirst.org/pubs/policybs/pb4.html>)

²¹ Food First/Institute for Food and Development Policy. (<http://www.foodfirst.org/pubs/policybs/pb4.html>)

²² Horrigan, L. Lawrence, R.S., Walker, P. “How Sustainable Agriculture Can Address the Environmental and Human Health Harms of Industrial Agriculture.” Environmental Health Perspectives 110 (2002): 453.

²³ Horrigan et. al, 453.

²⁴ Horrigan et. al, 450.

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General information: <http://www.sustainabletable.org/issues/>

Animal Welfare: <http://www.sustainabletable.org/issues/animalwelfare/>

Communities: <http://www.sustainabletable.org/issues/communities/>

Environment: <http://www.sustainabletable.org/issues/environment/>

Factory Farming: <http://www.sustainabletable.org/issues/factoryfarming/>

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