

The Economic Realities of CAFOsⁱ

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Back in the mid-1990s, few understood what people were talking about when they referred to “factory farms” or had ever heard the acronym, “CAFO.”ⁱⁱⁱ In 1994, I began working with a group of people in north Missouri who were facing the threat of a large corporate hog operation that was invading their community. Premium Standard Farms (PSF) was planning an operation with 80,000 sows that would farrow more than 1.5 million pigs per year. These hogs were to be housed in large, concentrated animal feeding operations or CAFOs—also referred to as “factory farms.” Most hogs in CAFOs are owned by large corporations but are produced in facilities owned and operated by individual producers under comprehensive corporate contracts. PSF planned to own the production facilities as well as the hogs. This type of hog operation had encountered public resistance as CAFOs had proliferated in North Carolina. PSF was looking for a more hospitable environment for their new large integrated slaughter plant/feed-mill/hog feeding operation.

After researching the issue, I concluded that the people of north Missouri had every reason to be concerned. Regardless, the PSF operation eventually was built—in spite of strong local opposition. It continues to operate as part of Smithfield Foods, one of the largest meat processing operations in the world—which is now owned by a large Chinese corporation. I have continued to work with rural people across the U.S. and Canada whose health and well-being are threatened by CAFOs invading their communities—in more than 20 states and 4 provinces of Canada. We certainly haven’t been winning all of our battles, as CAFOs now dominate all sectors of animal agriculture. However, we are slowly winning the war. With each battle, we have had an opportunity to inform more people about the harsh realities of CAFOs. As the general public becomes increasingly aware, they become increasingly concerned.

The factory farming system of production is losing the confidence and trust of the American people. A quick Google search, combining the words “CAFO or Factory Farm” with the name of any major U.S. newspaper, will reveal dozens of feature articles focused on CAFOs. The vast majority of these articles reveal growing concerns about negative public health, air and water quality, global climate change, and animal welfare impacts of CAFOs. CAFOs are also

ⁱ Prepared in May, 2020 for discussion at screenings of the CAFO documentary film, *Right to Harm*, and other uses.

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ⁱⁱⁱ CAFO is also an official USDA designation given to a concentrated animal feeding operation that feeds 1,000 or more animal units, which is 1,000 beef cattle, 2,500 hogs, 700 dairy cows, or 125,000 broiler chickens, confined in building or feed lots. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/livestock/af/> .

frequently featured in major newsmagazines and online newsfeeds. These media outlets address subjects of known public interest and are read by large segments of the American public.

The defenders of CAFOs have fought back with a nationwide propaganda campaign to convince the public that CAFOs are just a new and better version of traditional family farms.^{iv} They consistently label CAFO critics as uninformed or emotional. They insist that any government regulation of CAFOs must be justified by “sound science.” Public health and environmental protection are very complex issues, which makes it very difficult to quantify the risks posed by CAFOs. Links between specific instances of illness or pollution and specific CAFOs, or CAFOs in general, is difficult to “prove”—much like the public health risks associated with smoking tobacco. However, the preponderance of scientific evidence now validates the growing public concerns about CAFOs—as eventually was the case of linking tobacco smoking to public health risks. Much of this research has been carried out by public health and environmental researchers at highly respected universities and public institutions. Research carried out by agricultural university and agri-industry scientists has been “defensive research,” designed to raise public doubt about the research carried out by public health and environmental scientists. I refer to this as the “tobacco defense.”

For example, bacterial infections that are resistant to multiple antibiotics, such as the deadly MRSA, have become a major public health concern. The U.S. Center for Disease Control and Prevention (CDC),^v the World Health Organization (WHO),^{vi} and the Food and Agricultural Organization of the United Nations (FAO)^{vii} have all identified CAFOs as a primary source of antibiotic resistant bacteria. All of these organizations have called for elimination of the routine feeding of antibiotics to animals in CAFOs—a common practice used to promote weight gain and prevent diseases. Their recommendations would limit antibiotic use in CAFOs to treatment of veterinarian diagnosed infections. The public health risks of CAFOs certainly are not limited to antibiotic use. A 2018 report by the Iowa Policy Project concluded, “It is impossible to avoid the very substantial scientific evidence showing the impacts of livestock production and its very rapid growth on the degradation of Iowa water and air, and consequently the health of the people

^{iv} John Ikerd, Going Public with Concerns about CAFOs, Presentation Paper, University of Missouri, <http://faculty.missouri.edu/ikerdj/papers/PAYorkGoingPublicCAFOs.pdf>

^v Center for Disease Control and Prevention, Department of Health and Human Services, “Antibiotic Resistance Threats in the U.S. – 2013,” <https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf#page=6>

^{vi} World Health Organization, “Stop using antibiotics in healthy animals to prevent the spread of antibiotic resistance” *November, 2017*, <http://www.who.int/mediacentre/news/releases/2017/antibiotics-animals-effectiveness/en/>

^{vii} General Assembly of the United Nations, “Press Release—High Level Meeting on Antimicrobial Resistance,” September 2016, <https://www.un.org/pga/71/2016/09/21/press-release-hl-meeting-on-antimicrobial-resistance/>

of the state.”^{viii} While this report focused on CAFOs in Iowa, it cited more than 150 scientific references including research carried out in many different areas where CAFOs operate.

In November 2019, the U.S. The American Public Health Association called for a “Precautionary Moratorium on New CAFOs.”^{ix} The policy statement cites concerns for worker health and environmental justice as well as general public health concerns. In December 2019, the Center for Livable Futures at Johns Hopkins University reported the results of a nationwide poll of likely voters asking their opinions of government regulation of CAFOs.^x Larger samples were drawn from Iowa and North Carolina, the states with the largest numbers of CAFOs. A majority of Americans supported stricter regulation of CAFOs, with plurality support for a nationwide moratorium on new CAFOs. In Iowa and North Carolina, clear majorities favored moratoriums on new CAFOs as well as stricter CAFO regulations, particularly regulations needed to protect public health. The more people know about CAFOs, the greater the opposition. Increasingly, CAFO defenders are falling back on the only real defense they have ever had, which is a public appeal to economic necessity and inevitability.

Economic Reality of CAFO Necessity

Regardless of growing public concerns, their defenders claim that CAFOs are an economic necessity. They claim that CAFOs are the most economically efficient means of animal production and are necessary to keep retail prices of meat, milk, and eggs affordable to consumers. They argue that even if food security in the U.S. is not a concern, CAFOs will be necessary to provide animal protein for a growing and increasingly affluent global population. CAFOs are also defended as being necessary for the economic viability of rural communities in agricultural areas of the nation.

Economic Reality of CAFOs and Affordable Food Prices. The defenders claim CAFOs have proven successful in making animal products affordable for American consumers and will be necessary to do so in the future. They contend that prices would rise beyond the reach of average American consumers if CAFOs were heavily regulated or a moratorium was imposed on expansion of construction of new CAFOs. Without CAFOs, they claim low income consumers would not be able to afford animal products, which are an important source of dietary protein.

Admittedly, there were significant reductions in the percentage of incomes that Americans spent for food, including animal products, between the 1970s and late 1990s—years of rapid

^{viii} James Merchant and David Osterber, “The Explosion of CAFOs in Iowa and Its Impaction on Water Quality and Public Health,” The Iowa Policy Project, 2018 <http://www.iowapolicyproject.org/2018docs/180125-CAFO.pdf> .

^{ix} American Public Health Association, Precautionary Moratorium on New Concentrated Animal Feeding Operations. <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2020/01/13/precautionary-moratorium-on-new-and-expanding-concentrated-animal-feeding-operations> .

^x Johns Hopkins Center for Livable Futures, Survey: Majority Of Voters Surveyed Support Greater Oversight Of Industrial Animal Farms, Dec 10, 2019 <https://clf.jhsph.edu/about-us/news/news-2019/survey-majority-voters-surveyed-support-greater-oversight-industrial-animal>

agricultural industrialization. However, for the past 20 years, since 2000, prices of food have risen faster than overall prices paid by consumers, as reflected in the Consumer Price Index (CPI).^{xi} Furthermore, prices of red meat, poultry, and eggs have risen faster than food prices in general.^{xii} The only significant exceptions for animal products has been for milk and other dairy products. By the late 1990s, the poultry, beef, and pork sectors were all firmly under corporate control—either through ownership or comprehensive production contracts. Corporate contractors continued to push their contract growers for greater economic efficiency. However, they have used their control of processing and distribution to capture the economic benefits for their shareholders rather than pass the efficiencies on to consumers by lowering retail prices. In early 2019, the farmer’s share of the consumers’ food dollar hit an all-time low of less than fifteen cents of each consumer dollar.^{xiii} Any benefits from increases in economic efficiency of production are not being passed on to consumers but retained by corporate producers.

Dairy prices rose more slowly than other animal products because dairy is still in the corporate consolidation process. Continued corporate expansion of dairy CAFOs during periods of falling retail milk prices is a purposeful strategy. The corporate contractors are also processors and control pricing at the wholesale level, which strongly influence retail prices. During times of expansion, they reduce prices low enough to clear markets of production they have under contract but not low enough to allow profitable prices for production by independent producers. By using this strategy, corporate contractors force independent producers out of business, even producers who are more economically efficient than their contract operators. This strategy was used to squeeze independent producers out of poultry, beef, and pork production and is currently being used to squeeze out the remaining independent dairy farmers.^{xiv} This is not about keeping prices affordable for consumers; it’s about market power and profits for agribusiness corporations.

In addition, much of the recent expansion of meat production under corporate consolidation has been destined for export markets rather than domestic consumption. Exports of meat products remained consistently below 5% of total production from 1960 through the 1990s. By 2017, however, more than 10% of beef, 15% of poultry, and 20% of pork production was exported—rather than sold through U.S. markets to keep domestic meat prices affordable.^{xv}

^{xi} Food Inflation Calculator. <https://www.in2013dollars.com/Food/price-inflation/2000-to-2020?amount=20> .

^{xii} Meat, Poultry, Fish, and Eggs Inflation Calculator. <https://www.in2013dollars.com/Meats,-poultry,-fish,-and-eggs/price-inflation/2000-to-2020?amount=20>

^{xiii} National Farmers Union, Farmer’s Share of Food Dollar Falls to All-time Low, April 2019, <https://nfu.org/2019/04/25/farmers-share-of-the-food-dollar-falls-to-all-time-low/>

^{xiv} John Ikerd, 2019, The Corporatization of Animal Agriculture, blog post, <https://www.johnikerd.com/post/the-corporatization-of-animal-agriculture> .

^{xv} Purdue University Center for Commercial Agriculture, Did You Know How Important Trade is for the U.S. Meat Industry? <https://ag.purdue.edu/commercialag/home/resource/2018/04/do-you-know-how-important-trade-is-for-the-u-s-meat-industry/> .

The bottom line is that agricultural industrialization is not about affordability or food security. More people are classified as “food insecure” now than in the late 1960s.^{xvi} In 2019, one-in-nine Americans were classified as food insecure and one-in-seven American children lived in food-insecure homes.^{xvii} In addition, whatever has been gained by lower food costs has been more than offset by rising costs of health care. An epidemic of diet related illnesses; obesity, diabetes, hypertension, heart disease, and cancers, now threatens the physical and financial future of the nation.^{xviii} The economic reality is that the corporate agri-food system, including CAFOs, is about corporate profits, not food security or affordability.

The Economic Reality of CAFOs Feeding the World. Regardless of whether CAFOs have kept retail food prices affordable for Americans, their defenders claim CAFOs will be necessary in the future to meet the food needs of a growing global population. They claim even more CAFOs will be needed in the future to help American farmers to “feed the world.” Mass starvation and global malnutrition are presented as the inevitable consequences of abandoning industrial agriculture in general and CAFOs in particular.

In reality, CAFOs are not helping to feed the hungry people of the world today and will not do so in the future. Current U.S. meat exports are not going to nations of the world with the highest levels of hunger or food insecurity, which are predominantly in Africa, South America, and the Middle East.^{xix} Instead, U.S. meat exports go primarily to the developed and rapidly developing nations with growing economic middle classes of consumers who can afford to pay global market prices for meat.^{xx} The corporations that control CAFOs are agribusinesses—not charitable organizations. Most of the world’s hungry people can’t afford to buy U.S. animal products. In addition, much of the rest of the world learned valuable lessons from the Green Revolution. Industrial agriculture in less-developed nations didn’t produce more food for local people. Increased agricultural production was exported to wherever market prices were highest.

In reality, the rest of the world doesn’t need industrial agriculture. Contrary to popular belief, the food needs of 70% to 80% of the people of the world are still being met by small

^{xvi} CBS Documentary, “Hunger In America,” 1968, <https://www.youtube.com/watch?v=H94bq4jfmAa>.

^{xvii} USDA, ERS, “Food Security in the U.S., Key Statistics,” Updated Tuesday, October 11, 2016, <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx#foodsecure>.

xviii John Commins, “Healthcare Spending At 20% Of Gdp? That's An Economy-Wide Problem,” *Health Leaders*, September 19, 2018. <https://www.healthleadersmedia.com/finance/healthcare-spending-20-gdp-thats-economy-wide-problem>.

^{xix} Concern, Worldwide, “Where are the World’s Hungriest Countries?” <https://www.concern.org.uk/news/where-are-worlds-hungriest-countries>.

^{xx} USDA, Economic Research Service, Livestock and Meat International Trade Data, <https://www.ers.usda.gov/data-products/livestock-and-meat-international-trade-data/>.

family farms, most of which we would call “subsistence farms.”^{xxi} Not by industrial agriculture, and certainly not by CAFOs. Global research has shown that these small farmers could double or triple their production without adopting industrial farming methods.^{xxii} If these small family farms had access to basic agroecological research and government assistance similar to that provided to U.S. farmers in the early 1900s, they could “feed the world” without industrial agriculture.^{xxiii}

A 2016 FAO study by an International Panel of Experts in Sustainability, *From Uniformity to Diversity*, cited more than 350 studies documenting the failures of industrial agriculture and supporting the need for fundamental change to more sustainable farming systems. The study concluded: “Today’s food and farming systems have succeeded in supplying large volumes of foods to global markets, but are generating negative outcomes on multiple fronts: widespread degradation of land, water and ecosystems; high GHG emissions; biodiversity losses; persistent hunger and micro-nutrient deficiencies alongside the rapid rise of obesity and diet-related diseases; and livelihood stresses for farmers around the world.”^{xxiv}

The IPES report concludes: “What is required is a fundamentally different model of agriculture based on diversifying farms and farming landscapes, replacing chemical inputs, optimizing biodiversity and stimulating interactions between different species, as part of holistic strategies to build long-term fertility, healthy agro-ecosystems and secure livelihoods. Data shows that these systems can compete with industrial agriculture in terms of total outputs, performing particularly strongly under environmental stress, and delivering production increases in the places where additional food is desperately needed. Diversified agroecological systems can also pave the way for diverse diets and improved health.” The large and growing global Agroecology and Food Sovereignty movements have arisen to promote a fundamentally different model of food production and distribution.^{xxv} In reality, the rest of the world neither wants nor needs industrial agriculture or CAFOs.

Economic Reality of CAFOs and Rural Communities. Defenders claim that regardless of the need for CAFOs to meet the needs of consumers, CAFOs are necessary for the economic

^{xxi} Food and Agricultural Organization of the United Nations, *State of Food and Agriculture, 2014*, <http://www.fao.org/3/a-i4036e.pdf>.

^{xxii} John Ikerd, 2017, Family Farms of North America, FAO-UN Working Paper 152 December, 2016. http://www.ipc-undp.org/pub/eng/WP152_Family_farms_of_North_America.pdf.

^{xxiii} John Ikerd, 2017, Feeding the World without Industrial Agriculture, Organization for Competitive Markets presentation, <https://www.johnikerd.com/post/feeding-the-world-without-industrial-agriculture>.

^{xxiv} IPES – Food, International Panel of Experts on Sustainability, *From Uniformity to Diversity: A paradigm shift from industrial agriculture to diversified agroecological systems*, June 2016, http://www.ipes-food.org/images/Reports/UniformityToDiversity_FullReport.pdf

^{xxv} John Ikerd, Agroecology; Science, Farming System, or Social Movement, 2018, <https://www.johnikerd.com/post/agroecology-science-farming-system-or-social-movement>.

survival of many farming communities. They point specifically to community economic benefits from local investments in CAFOs, local sales of animals and animal products, and local employment in CAFOs and related local industries. However, decades of socioeconomic research and actual experience in CAFO communities reveal something very different. Whatever CAFOs contribute to local tax bases is more than offset by increased costs of maintaining rural roads and bridges that were not built to accommodate the heavy truck traffic associated with CAFOs. Also, local CAFO operators typically source construction materials and labor from outside their local communities. Feeder animals, feed, and other supplies are shipped in from elsewhere. Even animal health care is typically provided by corporate veterinarians. Few of the economic benefits from CAFOs remain in local communities.

The most frequent claim for community benefits is probably that CAFOs will increase local employment, which is sorely needed in many farming communities. However, the economic reality is that CAFOs employ far fewer people per dollar invested or unit of production than do the independent family farms they inevitably displace. The first research I personally did on this subject was an evaluation of CAFOs as a rural economic development strategy. I evaluated the employment implications of PSF's planned operation in north Missouri. My conclusion was that if PSF came into Missouri, their CAFOs would displace up to three independent Missouri hog farmers for every job they created.^{xxvi} CAFOs came to Missouri, and Missouri lost more than 90% of its independent hog producers. I doubt that the number of workers employed in CAFOs in Missouri exceeds more than one-third of the independent hog farmers they displaced.

Other studies later have estimated smaller displacement ratios. However, the basic economic reality is that lower costs of labor and management are the primary sources of economic gains from industrialization—in agriculture as elsewhere. The fundamental processes of industrialization are specialization, standardization, and consolidation. Specialization allows each worker to work more efficiently, which reduces the number of workers needed per unit of production. Standardization allows routinization and mechanization of production processes, which further reduces the need for workers as well as lowers skill levels needed by those employed. Specialization and standardization simplifies the management process, which allows industrial managers to oversee or manage larger operations. This process inevitably results in fewer and lower-paid workers and fewer managers per unit of production.

In the case of CAFOs, once livestock and poultry production became specialized, previously diversified family farms became specialized producers of either livestock or crops. Livestock and poultry were major sources of farm income that had made many diversified family farms economically viable. So, farmers who specialized in grain production were forced to farm more acres of land than before to maintain adequate family incomes. Larger crop and livestock operations meant fewer economic opportunities for farmers. With the industrialization of agriculture, the percentage of the U.S. labor force employed in agriculture dropped from 4.4% in

^{xxvi} John Ikerd, Economic Impacts of Increased Contract Swine Production in Missouri, <https://faculty.missouri.edu/ikerdj/papers/conhog.pdf>.

1970^{xxvii} to less than 1.5% in recent years.^{xxviii} Even in the communities where they locate, CAFOs do not actually *create* jobs. They simply *relocate* and *concentrate* fewer lower-paying jobs in CAFO communities than had previously existed on family farms elsewhere.

In addition, this loss of farm families cannot be offset by people moving into rural communities from elsewhere. No one really wants to move to a CAFO community. A 2015 study reviewed thousands of assessed property values for residences located up to 7 miles distant from CAFOs. The review concluded: “Overall, the new studies confirm the [negative] valuation impacts reported in earlier studies, as they range from 3.1% to 26% losses depending on multiple factors, and that properties immediately abutting an AO [CAFO] can be diminished as much as 88%.”^{xxix} It takes people, not just production, to support rural communities. It takes people not only to buy farm supplies and equipment but also to shop on Main Street for cars, clothes, shoes, and haircuts. It takes people to send their kids to local schools, to attend local churches, and to serve on volunteer fire departments and local town councils. When independent family farmers are displaced by CAFOs, it’s not just a matter of losing employment; it’s a matter of losing the essence of what it takes to be a viable rural community.

The economic reality is that CAFOs inevitably degrade and destroy rural communities where they locate. Industrial agriculture promises rural economic development but instead brings social and economic desecration. Cultural anthropologists and rural sociologists have compiled more than 70-years of research documenting the adverse impacts of industrial agriculture on rural economies and the quality of life in rural communities.^{xxx} A 2017 Wall Street Journal article labeled rural America as the “New Inner City.” In terms of poverty, education, teenage births, divorce, premature death, disability, and unemployment, rural counties now rank below inner cities.”^{xxxi} Drug abuse and crime, once urban problems, now plague rural communities. This is the economic reality of relying on agricultural industrialization, including CAFOs, for rural economic development.

Economic Reality of CAFO Inevitability

^{xxvii} Federal Reserve Bank of St. Louis- Economic Research, Employment in Agriculture, <https://fred.stlouisfed.org/series/USAPEMANA> .

^{xxviii} The World Bank, Employment in Agriculture-United States, <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?end=2019&locations=US&start=1991>

^{xxix} John A. Kilpatrick, “Animal Operations and Residential Property Values,” *The Appraisal Journal*, 2015, pp 41-50. http://www.protectthefalls.com/uploads/1/1/5/2/115213361/taj_wi15_p041-050_feat3-animaloperations.pdf .

^{xxx} Lobao, L., Stofferahn, C.W. The community effects of industrialized farming: Social science research and challenges to corporate farming laws. *Agric Hum Values* **25**, 219–240 (2008). <https://link.springer.com/article/10.1007/s10460-007-9107-8> Also available online at:

^{xxxi}<https://www.ndrurallife.com/Community%20Effects%20of%20Industrialized%20Farming-1.pdf>

Janet Adamy and Paul Overberg, RURAL AMERICA IS THE NEW ‘INNER CITY’, *The Wall Street Journal*, May 26, 2017, <https://www.wsj.com/articles/rural-america-is-the-new-inner-city-1495817008> .

CAFO defenders claim that regardless of how well they meet the needs of consumers or whether rural communities or the public in general approves, the continued proliferation of CAFOs is inevitable. Regardless of whether CAFOs are a consequence of free markets or government policy, defenders see CAFOs as the inevitable future of animal agriculture. They argue there are simply no economically viable alternatives.

Economic Reality of CAFOs and Markets. Defenders of CAFOs claim the industrial agri-food system *as a whole* is more economically efficient than any alternative system, regardless of farm level production costs. They promote the “conventional wisdom” that all consumers care about is cheap food, and that CAFOs are simply a reflection of consumer demand for cheap meat, milk, and eggs. However, the markets for agricultural products no longer have the basic characteristics of “free markets” that are essential for farm-level production to accurately reflect consumer preferences. One of the most fundamental requirements is that a market economy must have a sufficient number of sufficient small operations to ensure that competition among sellers prevents any producer, processor, or distributor from retaining excess profits for owners or investors rather than passing cost savings on to consumers in the form of lower prices.

During the 1980s, however, the U.S. Department of Justice essentially quit enforcing the antitrust laws needed to ensure competitive markets. The basic argument was that as long as producers didn’t restrict production and prices didn’t rise, or didn’t rise too fast, competition was not a concern. One generally accepted economic measure of market competition is the percentage of production controlled by the four largest operators in a given market—called the CR4 ratio. A CR4 ratio of 45% is considered “acceptable”—not necessarily good. Freed from government restraints on corporate consolidation, by 2011 CR4 ratios had risen above 50% in pork, broiler and turkey slaughter and above 80% in beef slaughter, and have continued to rise since.^{xxxii} For at least the past 30 years, trends in livestock and poultry industries have reflected the economic interest of the large agri-food corporations, not consumers or farmers. CAFO operators are able to deliver the constant supplies of semi-trailer loads of live animals, milk, and eggs needed to maximize the profits of these corporations, regardless of preferences of consumers. This is an economic reality of why CAFOs exist.

The corporate takeover of animal agriculture has also been made easier, if not inevitable, by accommodating government policies. Even before the 1980s, trends in the agri-food system were at least as much a reflection of government policy as consumer preferences. Industrial production requires large investments of capital, including buildings and machinery, in highly specialized operations. In addition, contractual coordination of these systems creates critical dependencies among producers, processors, and distributors. Disruptions at any level in the system disrupt the entire systems, as we have seen during the COVID pandemic. The end result is an industrial agri-food system that is an economically efficient but very economically risky and vulnerable to economic disruption or even collapse.

^{xxxii} Organization for Competitive Markets, 2018-2020, Concentration in the Marketplace, <https://competitivemarkets.com/concentration-in-the-marketplace/>

Large, specialized, contract farming operations lack the resilience and adaptability of smaller, diversified farms that are managed as integrated farming systems. This is an economic reality of industrial agriculture in general and CAFOs in particular. CAFOs are particularly vulnerable to disease outbreaks and localized power outages, both of which can result in massive death losses in CAFOs. Hurricanes, floods, or other natural disasters affect both livestock and feed grain production. Feed costs are volatile and unpredictable, reflecting the inherent fragility of the margin between scarcity and surplus in agricultural markets. The large upfront investments required for CAFOs, typically financed with borrowed money, magnify production and market risks. Corporate contracts mitigate market risks but leave contract producers vulnerable to the risks of disruptions anywhere in the processing/distribution system.

A variety of government farm and food policies have been designed and implemented specifically to mitigate these risks. Government “disaster payments” compensate livestock and poultry producers for losses due to droughts, floods, disease outbreaks, and market disruptions. Government programs for feed grain producers ensure a stable, low-cost supply of domestic feed grains meet the needs of corporate CAFO operations—as least under normal growing conditions. Government loan guarantees make low-cost loans readily available to finance construction and expansion of CAFO operations.

Whenever there is a disruption anywhere in the processing or distribution system, the government is quick to implement emergency programs, justified by the need to protect “food security.” The global COVID-19 pandemic has clearly revealed the lack of resilience and adaptability in the agri-food systems and the willingness of the government to mitigate corporate losses. Contract producers were euthanizing animals and dumping milk while consumers were paying exorbitant prices for scarce retail supplies of animal products. To mitigate the losses associated with the disruption, American taxpayers were asked to fund special emergency programs to compensate both producers and processors. Without taxpayer support for ongoing farm programs and periodic emergency disaster bailouts, CAFOs simply could not compete with diversified family farming operations that have built-in resilience and adaptability.

In reality, the CAFO system of production was adopted and continues to be supported by government programs because it provides an economic advantage for large, agribusiness corporations. The large corporate agribusiness have used their market power to gain political power. The corporations have been able to capture the economic benefits without bearing much of the economic risks and have been able to virtually ignore the inevitable environmental and public health risks. Perhaps the greatest government subsidy of industrial agriculture is the virtual absence of government regulations to protect public health and the environment. If CAFOs were required to mitigate these risks, even to the extent of other industries, CAFOs would not be economically competitive with independent family farms.

The vertical integration of processing with production of animal products was initiated by and continues to be controlled by large agribusiness corporations—first for poultry, then for beef,

next for pork, and now for dairy production. It's the agribusiness corporations, not their employees or contract producers, who reap the economic benefits, while imposing much of their economic costs on neighbors, rural communities, and American taxpayers. CAFOs are more a consequence of corporate economic and political power rather than a free market economy. This is an economic reality of CAFOs.

The Economic Reality of CAFOs as the Future of Animal Agriculture. Even if CAFOs are not a consequence of competitive markets, their defenders point out that the USDA, state departments of agriculture, and Land Grant Universities all promote CAFOs as the future of animal agriculture. They defend the fact that the U.S. government makes it easy for young farmers to borrow money to build and operate CAFOs as a means of ensuring the future of family farming operations. The U.S. government ensures loans made to new operators CAFOs who project positive cash flows with assurance of contracts with corporate integrators. This allows banks to make loans without taking significant risks, which lowers interest rates. However, the young farmers who take out large loans to build CAFOs are typically locking themselves into financial commitments that will require at least 20 years to fulfill. Decades of experience with contracting has confirmed that confinement buildings often become obsolete long before they are paid off, requiring additional loans for future renovations.

Perhaps an even greater risk associated with investments in CAFOs is that the CAFO system of production could become obsolete before loans are paid off. With growing public awareness of the negative environmental, social, public health consequences of CAFOs, an increasing number of Americans are choosing vegetarian or vegan diets to avoid CAFO products. One of the most powerful political movements opposing CAFOs today is the animal rights/animal welfare movement. The mission of the *animal welfare* movement is to prevent the inhumane treatment of animals in the CAFOs. Welfare concerns are linked primarily to crowding too many animals in too small spaces to allow the animals to exhibit normal behaviors. These large, crowded facilities also tend to result in a mental detachment of workers from the animals as living beings, fostering abusive treatment. Whereas the *animal welfare* movement seeks to eliminate CAFOs, the *animal rights* movement is philosophically opposed to killing or any human use of animals and would eliminate animal agriculture entirely.

Both of these movements are finding new and powerful allies among those with growing public health and environmental concerns linked specifically to CAFOs. However, the global movement to mitigate climate change may prove to be the most powerful ally for those who are striving to greatly reduce or eliminate human reliance on animal agriculture. Experts on the subject disagree on specifics, but most estimates credit agriculture in total with about 15% of human-caused global greenhouse gas emissions—about the same as transportation.^{xxxiii} Animal agriculture in particular is a major contributor of methane and nitric oxide, which are far more powerful greenhouse gasses than carbon dioxide.

^{xxxiii} Pierce Nahigyan, "How Much Does Agriculture Contribute To Global Warming?" *FOOD*, February 9, 2016. <http://www.planetexperts.com/how-much-does-agriculture-contribute-to-global-warming/>.

Quoting a study by a panel of experts on climate change commissioned by the FAO, the purpose was "to help raise the attention... to the very substantial contributions of animal agriculture to climate change and air pollution, to land, soil and water degradation, and to the reduction in biodiversity."^{xxxiv} Another distinguished FAO panel focused on changes in human diets required to "sustain a healthy planet." They describe a "universal healthy reference diet, based on an increase in consumption of healthy foods (such as vegetables, fruits, whole grains, legumes, and nuts), and a decrease in consumption of unhealthy foods (such as red meat, sugar, and refined grains)."^{xxxv} Animal agriculture is clearly targeted as a major cause of global climate change as well as other critical global problems. CAFOs provide an easy target for those who oppose animal agriculture for a variety of reasons. Rather than the future of animal agriculture, CAFOs could mean the end of animal agriculture.

The Economic Reality of Alternatives to CAFOs. CAFO defenders counter with the claim that most consumers, particularly in the U.S, will not give up eating meat, milk, and eggs regardless of other concerns. Their defenders claim there are simply no economically viable alternatives to CAFOs. Again, this is simply not true. As I have explained, the competitive advantages of CAFOs are short-run economic benefits that are realized primarily by the large corporate integrators—not by consumers or producers. I personally believe it would be a critical mistake for humanity to abandon animal agriculture, as animals have an essential role in creating a resilient, regenerative, sustainable agricultural system. As consumers become increasingly aware of the ecological and social realities of CAFOs, I believe most will be more than willing to pay somewhat higher prices for animal products in order to mitigate or avoid the risks to public health, environmental degradation, animal abuse, and social injustices associated with CAFOs.

This immediately raises the question, "How much more would animal products cost if we abandon CAFOs?" Organic, ecological, biological, biodynamic, and regenerative agriculture, as well as permaculture, holistic management, and agroecology are some of the most prominent alternatives to industrial agriculture in general. It's impossible to answer the question of how much more this diversity of alternatives would cost consumers, but the increase almost certainly would not be nearly as much as CAFO defenders have led people to believe. The economic advantages of CAFOs are far more about *scale* of production, for both contract growers and corporate processors, than lower *costs* of production.

The diverse, individualistic, and site-specific nature of the alternatives to industrial farming systems make it very difficult to conduct research that allows generalized statements about relative economic efficiencies of industrial and sustainable alternatives. One important characteristic of the alternatives to CAFOs is alternative livestock and poultry farmers are

^{xxxiv} The Livestock, Environment, and Development Initiative, Food and Agricultural Organization of the United Nations, 2006, "Livestock's Long Shadow," <http://www.fao.org/3/a0701e/a0701e00.pdf>

^{xxxv} Food in the Anthropocene—the EAT-LANCET Commission on Healthy Diets from Sustainably Produced Foods, Executive Summary, 2019, LANCET <https://www.thelancet.com/commissions/EAT> .

generally limited to producing significantly fewer animals than CAFO operation because they are more complex and challenging to manage. This is true for industrial operations versus sustainable alternatives in general. The resulting difference in scale of operation is very important at the farm level, but is not particularly important to consumers at the retail level. The same is true of economic advantages for large processing plants relative to smaller processors. Costs advantages that are critical to the competitiveness of large-scale processing and distribution are far less important to consumers.

Some of the alternatives of CAFOs are identified as organic, humanely raised, grass-fed, pasture based, free-range—reflecting specific consumer concerns. Although research is limited, previous studies have shown that production costs may actually lower in in some of these alternative systems than in CAFOs.^{xxxvi} Most of the “economies of size” in hog production, for example, are achieved at scales much smaller than operations classified by USDA as CAFOs.^{xxxvii} A study conducted by Iowa State University in 2001 compared costs of feeding out hogs in CAFOs with the costs in non-confinement, deeply bedded hoop house structures.^{xxxviii} This alternative is a solid-waste system often used to produce organic, humanely raised, and/or hormone and antibiotic free pork. The study indicated a cost advantage for the hoop house system during summer months but a larger advantage for CAFOs during the winter. The annual advantage for CAFOs amounted to just under \$3.00 per head. Hogs typically are slaughtered at around 285 lb. live weight, which yields about 150 lb. of pork at retail. When the \$3.00 advantage for CAFO hogs is spread over 150 retail lbs., it amounts to about 2 cents per retail pound of pork. Retail pork prices have recently averaged more than \$3.00 per lb., meaning a 2 cent difference would amount to less than 1% of retail pork prices.

The primary economic advantage for the CAFO is that an individual operator may be able to produce two or three times more hogs than an alternative hog farmer. The Iowa State research mentioned above indicated about \$15.00 per head annual profit for the hoop house operation compared with around \$18.00 for the CAFO operation. A hoop house hog producer who markets 2,000 hogs per year, at \$15.00 per head profit, would make around \$30,000 total profit. The hoop house producer in this case would likely need additional sources of income to make a living. A CAFO operator might be able to produce 5,000 head, and at \$18.00 per head profit, would make \$90,000 total profit. Even if a contract CAFO operator received only half of the total, with the rest going to the corporate contractor, the CAFO operator would have a \$15,000 advantage over the hoop house operator.

^{xxxvi} USDA Sustainable Agriculture Research and Education Program, “Hog Production Systems,” <http://www.sare.org/Learning-Center/Bulletins/Profitable-Pork/Text-Version/Hog-Production-Systems>

xxxvii Michael Duffy, 2009, Economies of Size in Production Agriculture, *Journal of Environmental Nutrition*, Jul; 4(3-4): 375–392. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3489134/> .

^{xxxviii} Mark Honeyman and Arlie Penner, 2001, Economies of Finishing Swine in Hoop House Structures and Confinement; Seasonal and Annual Comparisons, Iowa State University. <https://www.extension.iastate.edu/agdm/livestock/html/b1-81.html> .

In addition, a contract grower with a corporate production contract would receive an assured positive return per head produced, whereas independent hoop house producers would risk economic losses from unfavorable market prices. Of course, there would also be a possibility of greater profits for the hoop house operator. Equally important, the hoop house operation would require management skills that are not necessary for operators of CAFOs, who pretty much produce by following corporate management instructions. The important point for consumers is that even if the lower costs of production for CAFOs were passed on to consumers in terms of lower pork prices, the advantage for the CAFO operation would amount to less than 2 cents per retail pound, less than 1% of retail pork prices. Obviously production cost and prices in 2020 are different from those in the 2001 study. Even if the production cost advantages for CAFOs were twice as large today, the difference would hardly be noticed at retail, as retail prices are continually fluctuating up and down in response to changing market conditions.

The same is true of economic advantages for large processing operations. Their continuing defense and support of CAFOs is a result of their advantages to support larger-scale processing—not cost savings to be passed on to consumers. The economic efficiency of large processing plants depend on a steady supply of uniform animals or commodities to keep facilities running at optimal capacity. CAFOs serve this function much more effectively than a large number of independent producers who sell their animals at a variety of open markets. Again, it is difficult to find recent research on economies of scale in meat processing. Most of the new processing plants have been large scale, slaughtering and processing 10,000 to 20,000 hogs per day, and few mid-size and smaller size plants are in operation for comparison.

Based on available research, it's probably reasonable to assume around \$15.00 per head as an economic advantage for a large pork processing plant over smaller plants that would be needed to accommodate smaller hog producers producing for local or regional markets.^{xxxix} When this \$15.00 cost advantage is spread over 150 retail pounds, it amounts to about 10 cents per pound, or a bit over 3% of retail prices, with average prices of pork at \$3.00 per lb. This \$15.00 per head advantage is mere pennies per pound for pork consumers but means \$75 million per year for a plant processing 5 million hogs per year.

Again, it is doubtful if much of this cost advantage is actually passed on to consumers. Even if the figures used in these two comparisons are off by 50% or more, the economic reality would remain virtually unchanged. CAFOs do not exist and processing plants are not large simply because the viable alternatives would result in higher prices for consumers. If consumers were given a clear choice, and understood the consequences of their choices, I believe most American consumers would willing pay a few pennies more to help mitigate the risk to public health, the environment, animal welfare, and quality of life in communities associated with CAFOs. The

^{xxxix} Marvin Hayenga, 1997, Cost Structures of Pork Slaughter and Processing Firms: Behavioral and Performance Implications, Iowa State University. <https://pdfs.semanticscholar.org/1d26/b504112e777c6b0c6a7ec38846aad60abc6.pdf> .

economic reality is that CAFOs exist because the current system of animal agriculture is more profitable for the agribusiness corporations—not because we can't afford the more resilient, regenerative, sustainable alternatives.

Crisis and Opportunity for Change in Rural America

The agri-food systems disruptions resulting from the COVID-19 pandemic has revealed that neither farmers, food service workers, consumers, nor local governments have any degree of control over their local agri-food economies. Their economic well-being depends entirely on a few large corporations that have no legal responsibility other than to maximize profits for the benefit of their stockholders. The economic reality is that the agri-food system is being used by agribusiness corporations to turn rural communities into economic colonies.^{xl} Nowhere is this phenomenon more evident than in traditional farming communities where large, corporately-controlled CAFOs or factory farms have displaced small, independent family farms. People in rural communities are led to believe they have no choice. However, the continued corporate domination of our agri-food system is neither necessary nor inevitable.

Times of crisis, like the COVID-19 pandemic, not only reveal vulnerabilities in the current systems but also present opportunities for fundamental change.^{xli} Thus far, the farmers who provide alternatives to CAFOs have sold their products through growing market niches made up of consumers who share their concerns and their core values. Since these markets don't fit the industrial system of mass processing and distribution, the farmers have had to develop their own processing and distribution systems. They market to local customers by selling at farmers markets, CSAs, roadside stand, or perhaps through local grocery stores or restaurants. Some market collectively through local food hubs to local schools or other public institutions. These farmers have an opportunity to emerge from the COVID crisis even stronger as a consequence of the growth in consumer awareness of the risks inherent in the current industrial, global food system—and the availability of viable local alternatives.

Farmers who offer customers online options have reported consistent sharp increases in sales during the pandemic. Online grocery sales in general doubled when people were urged or ordered to stay at home to mitigate the pandemic. Some farmers also use online platforms to collaborate in providing a wide assortment of locally grown products for local restaurants, schools, hospitals, and other institutional buyers. Community or bio-regionally scaled processing facilities could allow local food systems to completely bypass the industrial food system. From an economic perspective, online food systems could function more efficiently than the industrial scale system created by Amazon.com. Economies of scale in developing and maintaining online marketing platforms are minimal, and distances between farms and consumers and other logistical complexity would be far less for local online food systems. The flaws revealed by the

^{xl} John Ikerd, 2017, The Economic Colonization of Rural America; Increasing Vulnerability in Volatile Times, Presentation paper, <http://faculty.missouri.edu/ikerdj/papers/OhioRSSConference2017.pdf> .

^{xli} John Ikerd, Crisis and Opportunity for Local Food Systems, <https://www.johnikerd.com/post/crisis-and-opportunity-for-local-food-systems> .

COVID-19 crisis could well provide the motivation to begin breaking the corporate stranglehold on rural communities by transitioning to new local and regional community-based food systems.

The transition from an industrial, global to a sustainable, local food system would be far easier if current federal and state funding of farm programs were shifted to share farmers' risks of transitioning to sustainable farming systems, instead of continuing to prop up the fundamentally flawed industrial system. Such changes have been proposed, and supported by several 2020 presidential candidates.^{xlii} Several presidential candidates also have promised strict enforcement of antitrust laws to break the monopoly power of large agri-business corporations. A bill proposed in the U.S. Senate would place a moratorium on new CAFOs and phase out existing CAFOs by 2040.^{xliii} Quick implementation seems unlikely for any of these political actions. However, changes in food systems within local communities and bioregions need not wait for changes in federal or state farm and food policies.

We should continually remind ourselves that the current industrial agri-food system, while supported by government policies, was not created by government decree. It was created by voluntary changes in individual choices of farmers and consumers—one farmer and one consumer at a time. The current industrial food system was essentially created during a period of less than 50 years, primarily between the 1950s and 1990s. I lived through that transition; it happened quickly. I believe a new network of resilient, regenerative, community-based food systems can be recreated even more quickly—once people in general become aware of the necessity for fundamental, systemic change. Nowhere is this more urgently needed than in replacing CAFOs with a socially responsible and ecologically sustainable animal agriculture. Regardless, there is no better time than a crisis to seize the opportunity to create a new and better economic reality for farmers, consumers, rural communities, and the future of humanity.

End Notes:

^{xlii} Mackenzie Feldman, John Ikerd, Seth Watkins, Charlie Mitchell, and Johnny Bowman, “Regenerative Agriculture and the Green New Deal,” Data for Progress, Green New Deal Policy Series, Food and Agriculture, January 2020. <https://www.dataforprogress.org/memos/regenerative-agriculture-and-the-green-new-deal/> .

^{xliii} Elizabeth Warren and Cory Booker Cosponsor Bill to Phase out Factory Farms, RFD TV, May 11, 2020, <https://www.rfdtv.com/story/42114892/elizabeth-warren-cory-booker-cosponsor-bill-to-phase-out-factory-farming> .