

# ***Swine and Suffering:***

## **An Introduction to the Hidden Harms of Factory Farms**



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## **An Introduction to the Hidden Harms of Factory Farms**

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# Preface

It has been some sixty years since Rachel Carson first warned in *Animal Machines* (1964) about the dangers of factory farms to the sentient animals trapped within them and to the humans who consumed them. Carson, who grew up on a small farm, felt deeply the shift to industrial scale farming, centralized production, and corporate profits. Factory farms were just beginning; few people knew much about them. So Carson painted a vivid portrait:

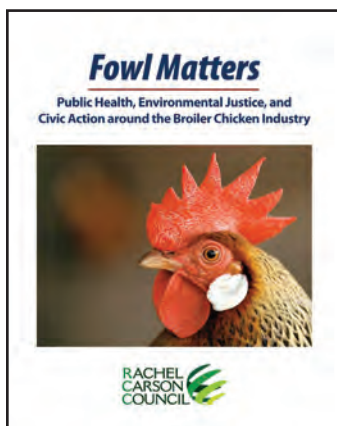


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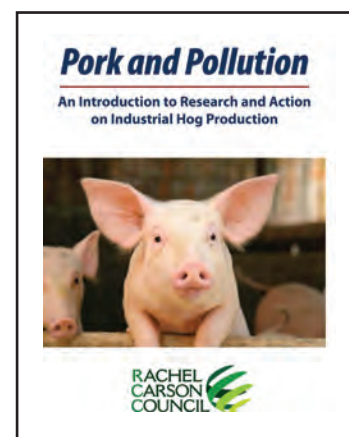
**“Gone are the pastoral scenes in which animals wandered through green fields or flocks of chickens scratched contentedly for food. In their place are factory-like buildings in which animals live out their wretched existences without ever feeling the earth beneath their feet, without knowing sunlight, or experiencing the simple pleasures of grazing for natural food—indeed, so confined or so intolerably crowded that movement of any kind is scarcely possible.”**

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Some fifty years later, when huge numbers of immense CAFOs (Concentrated Animal Feeding Operations) had become the main source of meat production in the United States, the Rachel Carson Council (RCC) issued two groundbreaking reports about the environmental health, justice, and climate change effects of factory farms in North Carolina where they are heavily concentrated. [\*Pork and Pollution: An Introduction to Research and Action on Industrial Hog Production\*](#) (RCC, 2015) and



[\*Fowl Matters: Public Health, Environmental Justice, Civic Action and the Broiler Chicken Industry\*](#) (RCC, 2017) laid out the causes and consequences of industrialized hog and chicken production so all could see.



And with other organizations, we began educational, organizing, and advocacy campaigns to reform and someday eliminate factory farms altogether.

There have been some victories. Residents in North Carolina whose homes had been surrounded by the pollution, sound, and stench of hog CAFOs won a number of nuisance lawsuits for harm to their

properties. But the state legislature quickly forbade such nuisance suits in the future. Restrictions of one sort or another on CAFOs have been passed, and some technological fixes like transforming hog waste into biofuel have been developed. Far more citizens and environmental, consumer, health and justice organizations are aware of the perils of industrial pork production. But, sadly, the number of industrialized farms, their foul and dangerous emissions, and their consequent harm to animals, people, the environment, and the crisis of climate change continues to grow.

That is why the Rachel Carson Council has once again produced a report to call attention to factory farms, or CAFOs, and their overwhelming concentration in just a few small areas of the United States – Iowa, Minnesota, and North Carolina. *Swine and Suffering* is designed as a simple, useful short introduction for a new generation who, like those who have gone before, know little about where their food, especially their meat, comes from, or the consequences of its industrial scale production for their lives.

*Swine and Suffering* is the product of two outstanding members of the new generation of environmental leaders, Francesca Cetta and Lucy Goldman of Duke University, who worked with me and with RCC Associate Director Mackenzie Bodman as RCC Stanback Fellows in Washington, DC. They also carried out firsthand investigations from a light plane of the current status of CAFOs in North Carolina. They were determined to expand the number of Americans who know and care about the perils of factory farming. *Swine and Suffering* contains the latest information possible about CAFOs – their location, numbers, and consequences. If enough people read and circulate it -- to friends, family, neighbors, colleagues -- we may at last be able to build a movement of concerned citizens strong enough to take on the very entrenched interests of industrial agriculture.

— Bob Musil, President & CEO, the Rachel Carson Council.

# Why Another Report on CAFOs?

CAFOs (Concentrated Animal Feeding Operations) and factory farming have redefined agriculture and food globally in the past 50 years. The [Rachel Carson Council \(RCC\)](#) has been tracking the problem for over a decade with seminal reports, blogs, and policy leadership. The effects of CAFOs on human and environmental health are plentiful, but very few American citizens are aware of this threat to their health and homes. Outside of the communities that experience their effects, there still is limited knowledge about the impact of hog and poultry CAFOs in North Carolina. *Swine and Suffering* hopes to narrow this awareness gap. It offers a straightforward, simple, yet authoritative introduction to Americans who, despite the best efforts of many organizations, do not know about factory farms and their harmful effects. *Swine and Suffering* offers a contemporary, comprehensive definition of CAFOs, puts their current quantity and locations in the United States in context, and outlines their various environmental, human health, and economic effects with special focus on North Carolina.



## The Basics About CAFOs

Over the past five decades, there has been a notable transformation in the United States agricultural industry. The focus has shifted from predominantly local farming to the emergence of large-scale industrialized farming operations, commonly referred to as Concentrated Animal Feed Operations (CAFOs). The US Environmental Protection Agency (EPA) defines CAFOs as livestock operations where the animals are confined for at least 45 days in a 12-month period and have no grass or other vegetation present in their confinement during the normal growing season.<sup>1</sup> The effects of CAFOs on human and environmental health are disastrous. Large amounts of fecal waste and air pollution are produced, seriously harming local ecosystems and nearby residents' health. CAFOs were developed as an easy way to feed our growing population, but today CAFOs are destroying our public health, wellbeing, and environment.



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**CAFOs produce an almost unfathomable amount of animal waste.  
Even the smallest CAFO produces as much waste as 16,000 humans.  
Each year, the pig industry in North Carolina alone produces 10 billion  
gallons of waste – enough to fill 1500 Olympic-sized swimming pools.<sup>2</sup>**

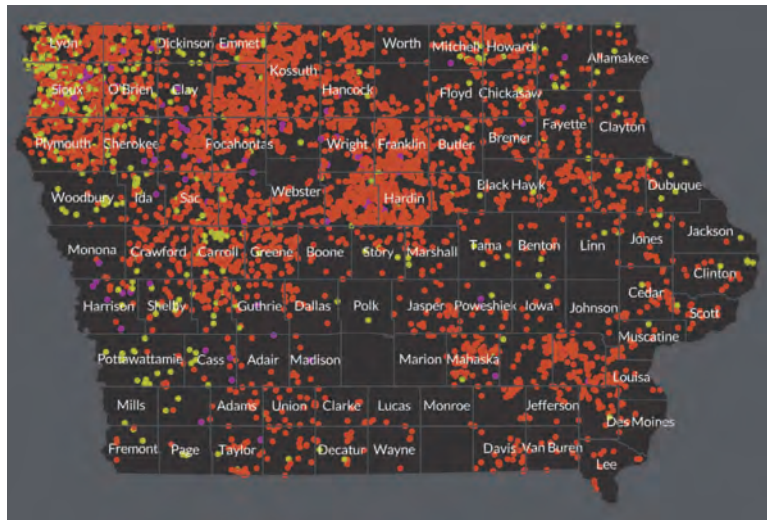
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| Animal Sector  | Size Thresholds (number of animals) |                  |                  |
|--|-------------------------------------|------------------|------------------|
|  | Large CAFOs                         | Medium CAFOs     | Small CAFOs      |
| cattle or cow/calf pairs   | 1,000 or more                       | 300 - 999        | less than 300    |
| mature dairy cattle  | 700 or more                         | 200 - 699        | less than 200    |
| veal calves  | 1,000 or more                       | 300 - 999        | less than 300    |
| swine (weighing over 55 pounds)                                      | 2,500 or more                       | 750 - 2,499      | less than 750    |
| swine (weighing less than 55 pounds)                                 | 10,000 or more                      | 3,000 - 9,999    | less than 3,000  |
| horses   | 500 or more                         | 150 - 499        | less than 150    |
| sheep or lambs   | 10,000 or more                      | 3,000 - 9,999    | less than 3,000  |
| turkeys  | 55,000 or more                      | 16,500 - 54,999  | less than 16,500 |
| laying hens or broilers (liquid manure handling systems)             | 30,000 or more                      | 9,000 - 29,999   | less than 9,000  |
| chickens other than laying hens (other than a liquid manure systems) | 125,000 or more                     | 37,500 - 124,999 | less than 37,500 |
| laying hens (other than a liquid manure handling systems)            | 82,000 or more                      | 25,000 - 81,999  | less than 25,000 |
| ducks (other than a liquid manure handling systems)                  | 30,000 or more                      | 10,000 - 29,999  | less than 10,000 |
| ducks (liquid manure handling systems)                               | 5,000 or more                       | 1,500 - 4,999    | less than 1,500  |



The waste is then stored in “lagoons” next to the animal confinements. This liquid waste is filled with pathogens including salmonella, insecticides, antimicrobial agents, and other pharmaceuticals. While human sewage is treated with chemical and mechanical filtration before being released to the environment, CAFO waste is stored untreated in lagoons until it is sprayed onto nearby field crops. When sprayed onto fields, or when these lagoons leak, the pathogens, heavy metals, and antibiotic-resistant bacteria from the waste can reach nearby homes and drinking water sources.

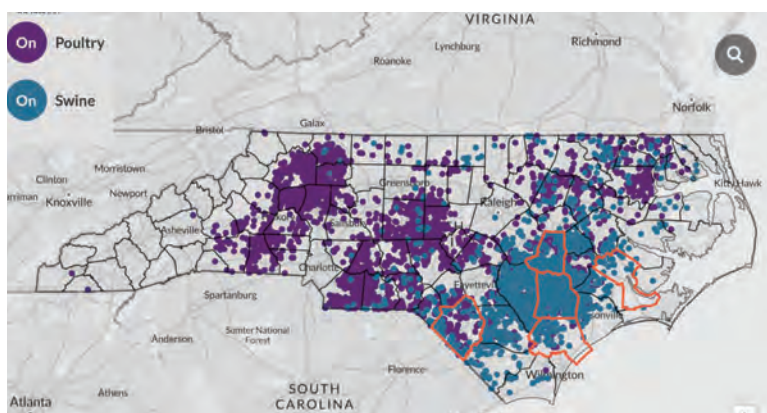
Area residents then suffer from nasal irritation, lung problems, headaches, nausea, elevated blood pressure and other effects.<sup>3</sup> Most lagoons leach to some extent into groundwater, but hurricanes, storms, and flooding can cause them to overflow and spill raw sewage onto the landscape and into waterways.<sup>4</sup> CAFO pollution in water sources can lead to deadly diseases in infants, serious disease outbreaks in adults, and hypoxia fatal to marine organisms.<sup>5</sup>



**Iowa**

## Where the CAFOs Are

There are roughly 450,000 CAFOs in the U.S. Of all the states, Iowa, North Carolina, and Minnesota have the most CAFOs. Iowa alone has 20 million hogs living on CAFOs throughout the state.<sup>6</sup> North Carolina has 10 million industrialized hogs or swine, while Minnesota has 8.6 million.<sup>7</sup>



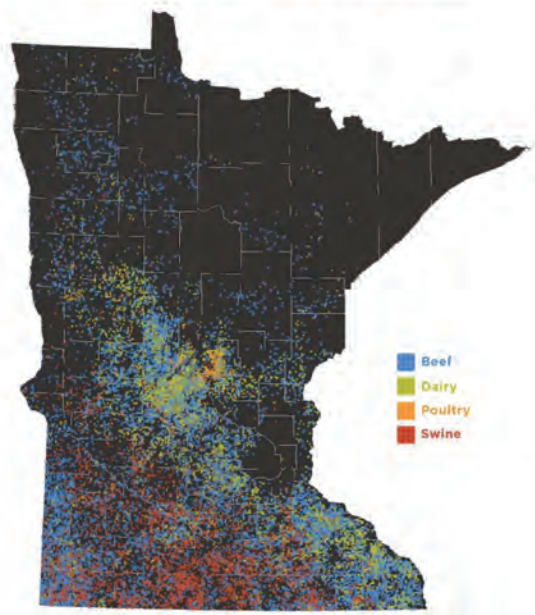
**North Carolina**

## Hogs and Environmental Justice in North Carolina

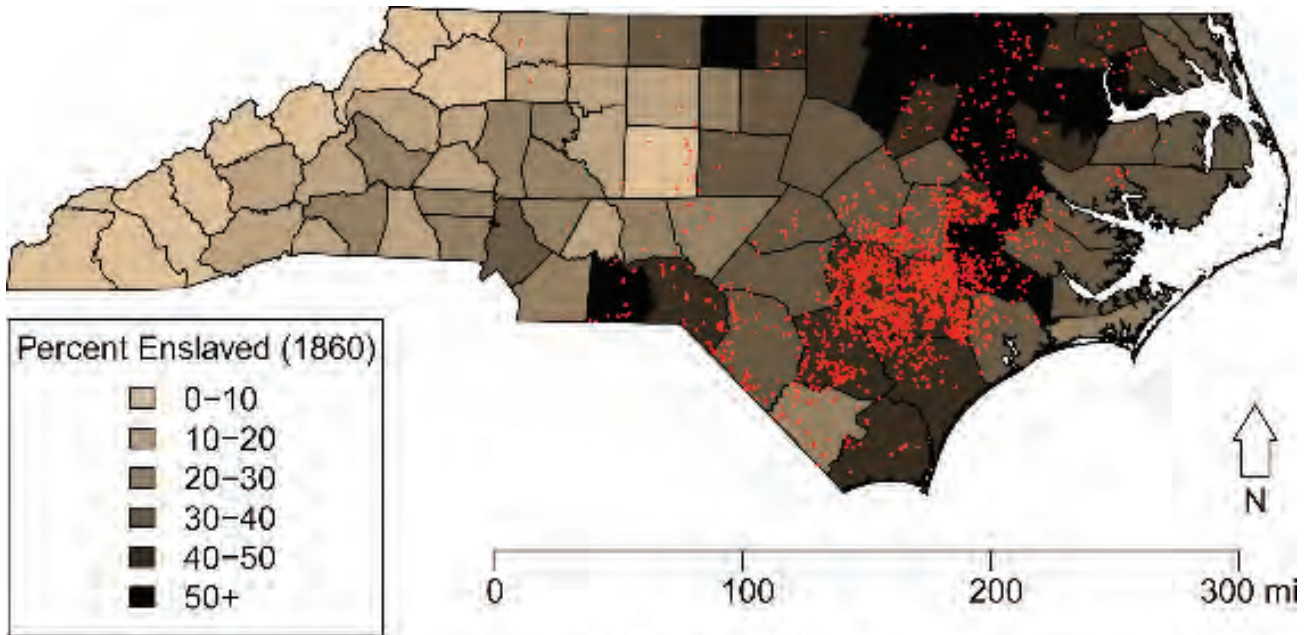
The Environmental Protection Agency (EPA) defines Environmental Justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”<sup>9</sup> Environmental injustice is the absence of that fair treatment. CAFOs are often placed in low-income, minority communities where residents have little economic and political power. These residents are at significantly higher risk for adverse health outcomes, as well as economic disenfranchisement and a lowered quality of life<sup>10</sup>.

Although North Carolina does not have as many CAFOs as Iowa, its history of CAFOs paints a stark portrait of blatant environmental injustice. Almost all of the state’s 10 million industrial hogs are raised on CAFOs in Eastern

FIGURE 2: MINNESOTA IS HOME TO NEARLY 24,000 FEEDLOTS



**Minnesota<sup>8</sup>**



Source: 1860 Census: Population, Agriculture & Other Data [US, States & Counties]

North Carolina. The state therefore has the highest density of hog CAFOs anywhere in the U.S.<sup>11</sup> In some of these Eastern counties, pigs outnumber humans 35-1.<sup>12</sup> These counties fall within the Black Belt, a region stretching across the South where enslaved people worked on plantations and then suffered from Jim Crow and segregation. Today, these Black residents still suffer from high rates of poverty, poor health care, low educational attainment, unemployment, and substandard housing.<sup>13</sup> Polluted water and air and declining property values as a result of proximity to CAFOs have harmed the health and economic strength of these communities.<sup>14</sup>



**Hog CAFO directly adjacent to a resident community in Onslow County (Lucy Goldman)**

When looking at North Carolina, understanding the disparities in CAFO distribution is critical. Two counties, Sampson and Duplin, each have 296 and 300 CAFOs respectively.<sup>15</sup> Comparatively, counties just 30 miles away, New Hanover and Wake, have none. The income differentials between these counties are also stark. The median annual income in New Hanover is \$31,054 per individual,<sup>16</sup> 37% higher than nearby Duplin County's \$22,665.<sup>17</sup> The contrast is even greater between Sampson County and Wake, where Wake's median annual income of \$41,189<sup>18</sup> is 76% higher than Sampson's \$23,317.<sup>19</sup> In the case of North Carolina, as well as many other states, the distribution of CAFOs across the state is by no means equitable. CAFOs are the most concentrated in counties with the least financial prosperity, further exacerbating socioeconomic and racial disparities.



## CAFOs: A Legislative and Policy Framework

At the federal level, two of the most important pieces of environmental legislation - the Clean Water Act and Clean Air Act - do little to regulate CAFOs. The Clean Air Act has no CAFO regulation at all and the Clean Water Act has only very limited mention of CAFOs.<sup>20</sup> As a result, some lawmakers and activists at the federal and local levels are working to challenge and change the environmental racism and degradation associated with CAFOs. The Farm System Reform Act is the most relevant piece of active legislation designed to reform farming in the United States. U.S. Senator Cory Booker introduced the Farm System Reform Act, along with a bundle of other progressive farming bills on February 2nd, 2023. The Farm System Reform Act completely bans the creation of new CAFOs in the U.S. The bundled bills introduced by Booker also include the Industrial Agriculture Accountability Act, the Protecting America's Meatpacking Workers Act, and the Protect America's Children from Toxic Pesticides Act.<sup>21</sup> The EPA is also planning to launch a study of CAFOs and make a decision whether to revise the Effluent Limitations Guidelines to limit CAFO water pollution.<sup>22</sup>



At the local level in North Carolina, many environmental organizations are doing tireless work to bring attention to the CAFO issue and advocate for effective policy change and accountability. Local and state groups, aided by a few national organizations, organize protests, bring their concerns to policymakers, and generate public interest in the issue. Groups like Coastal Carolina River Watch (CCRW) and the Waterkeeper Alliance, with its NC Pure Farms, Pure Water Campaign, monitor and quantify the environmental impact of CAFOs in order to better engage local policymakers. Along with CCRW and Waterkeepers, other local advocacy groups include: Cape Fear River Watch, North Carolina Black Alliance, Sierra Club NC Chapter, and NC Environmental Justice Network.<sup>23</sup> These and other grassroots activists and advocates also work with the few national organizations that focus on CAFOs such as the Rachel Carson Council and the Environmental Working Group.

## CAFOs, a Closer Look

CAFOs affect the environment, human health, and the economy on local and national scales. Case studies provided here offer telling examples of the damaging effects of CAFOs. Using both micro and macro perspectives, the overall harms from factory farms are clear, quantifiable, and shocking.

## Environmental analysis

When flooding occurs, CAFO waste from lagoons is washed into the surrounding communities' water supply tainting natural resources including local waterways and greenspaces, inundating them with animal waste and chemicals. It takes years for water sources to recover from that quantity of waste.

In North Carolina local landscapes therefore experience frequent and severe water contamination from CAFO waste. Local streams and waterways are repeatedly filled with this waste and carry the pollutants to larger bodies of water.<sup>24</sup> Such regular flooding is not uncommon, but it also includes severe floods from Hurricanes Floyd, Florence, Matthew, and others.

Through measuring dissolved oxygen, nitrogen, and other compounds in the water, organizations like the CCRW are finding that CAFO pollution leads to harmful algae blooms and fish kills in the streams of North Carolina.<sup>25</sup> With climate change making flooding and severe storms more common, local environments are at an increased risk for degradation and deadly pollution from CAFO waste.



**CAFOs contaminate the surrounding environment**

The factory farming industry is responsible for a large proportion of greenhouse gas emissions.<sup>26</sup> Although precise measurements are difficult, a number of reputable organizations estimate that the worldwide slaughtering of animals accounts for at least 14.5 percent and perhaps as much as 20 percent of global greenhouse gas emissions. The Breakthrough Institute reported recently that most estimates are based on older data and that emissions have been rising and will continue to do so.<sup>27</sup> These emissions do not just affect residents in that community, state, or country, but rather impact the entire Earth. CAFOs are the largest culprit behind these emissions due to the large number and density of livestock in a CAFO.<sup>28</sup> Factory farms are responsible for around 33% of global agricultural methane emissions.<sup>29</sup> Since methane is 25 times more dangerous than carbon dioxide for the environment<sup>30</sup> the large quantity of methane produced by CAFOs is a significant factor in exacerbating global climate change.



In contrast to CAFOs, local farms have a greater ability to mitigate environmental impacts through thoughtful farming practices. Organic fertilizers and materials on local farms reduce the harmful pollutants that run off from larger farms. Rotating animals limits the stress on them and the land. Diversifying the animals and crops produced on the farm is more sustainable to maintain nutrient levels in the land.<sup>31</sup> In North Carolina, the [NC Natural Hog Growers Association \(NCNHGA\)](#) has banded such small hog farms together to promote more sustainable methods which are simply not possible on large-scale, single animal CAFOs.<sup>32</sup>

## Human health analysis

Because of the environmental pollution caused by CAFOs, nearby residents bear the brunt of waste-related health effects. For instance, children and adults living close to CAFOs experience higher levels of asthma and wheezing as a result of CAFOs' air pollution. Further, people living within two miles of CAFOs are four times more likely to have headaches, six times more likely to have eye irritation, and eight times more likely to suffer from frequent nausea.<sup>33</sup> CAFOs are also highly problematic because animals living on them are constantly pumped



***Effects of air/water pollution on nearby CAFO residents***

full of antibiotics. Consequently, multiple studies have found that proximity to CAFOs increases the prevalence of antibiotic resistance infections and diseases caused by human-animal contact.<sup>34</sup> Higher risk for disease and birth defects are also present in the surrounding communities.<sup>35</sup>

When considering mental health, several studies have found that CAFO pollutants increase stress, anxiety, annoyance, and negative moods.<sup>36</sup> As such, CAFOs greatly diminish quality of life for nearby residents. This is exacerbated by the financial consequences, as the pollution and stench from CAFOs cause property values in the surrounding communities to plummet, leaving families economically vulnerable.<sup>37</sup>

Many of these detrimental health effects can be attributed to aerosolized waste and water source contamination. The waste from lagoons is dispersed in two hazardous ways: deliberately sprayed onto fields or through overflows into waterways. Both dispersions are highly unregulated in most states and resultantly cause extensive health problems.<sup>38</sup>

### ***Macro level: Effects of antibiotic resistant bacteria on all Americans***

Due to the concentration of animals in small spaces, farmers have to use antibiotics to keep the animals alive. The quantity of medication leads to antibiotic resistant bacteria in our food supply. Routine antibiotics are therefore deemed useless and more intense antibiotics have to be used to cure infections in humans. Antibiotic resistant bacteria inhibit our ability to easily fight infections and can lead to more serious health issues. Steve Wing, a public health and sustainable agriculture expert, stated that antibiotic treatment should be banned in order to create a fair playing field for small, sustainable farmers and create a healthier, more just agricultural system.<sup>39</sup>

## Economic analysis

### *Macro level: Distorted market prices for animal products*

The overconsumption of animal products is a large contributor to the climate crisis. Factory farming has enabled this overconsumption by providing unsustainable, cheap animal products. In the 1970s, the US Department of Agriculture pushed the “get big or get out” principle, so small scale farms started investing in machinery and land to accommodate the new output.<sup>40</sup> These family farms were overleveraged and depended on corporations to survive. In the last 50 years, farming has become a corporate industry. The corporate agriculture business uses vertical integration to be profitable. In practice, vertical integration is controlling or having a stake in everything from growing to consumption. Such a business structure is profitable since the corporation can dictate production techniques, prices, and supply and demand. Tim Gibbons, an advocate for family farming, states that multinational corporations, “through government support and taxpayer support, intentionally overproduce so that the price stays low, sometimes below the cost of production. That kicks their competition out of the market.”

## Public Awareness and Engagement

In addition to passing crucial legislation, public engagement is also incredibly important for raising awareness about CAFOs. Large CAFO corporations have no power if consumers don’t buy their products. However, in order for people to stop buying from these corrupt corporations, they first need to be exposed to their problematic practices. This is where educational programs and documentaries such as *The Smell of Money* play an important role in creating recognition and utilizing the power of the public to hold CAFO executives accountable.<sup>41</sup>

Besides consumer boycotting, it is critically important that industrial producers are forced to pay for their damages to human health and the environment. It is important to distinguish between CAFO owners, typically local farmers, and the corporate executives they work for. Four large corporations, Tyson, Smithfield, Cargill, and JBS, produce 85% of the meat consumed in America through contracts with farmers across the nation.<sup>42</sup> These giants can easily afford to cover the cost of the damage they inflict on communities, the environment, and local farmers. As such, regulations against CAFOs must be enforced with an emphasis on targeting the wealthy corporations that profit from damaging communities they are not a part of. Further, the broad use of antibiotic treatment should be banned in order to create a fair playing field for small, sustainable farmers and create a healthier, more just agricultural system.

The image shows the Smithfield logo, which consists of the word "Smithfield" in a bold, black, sans-serif font. Below it, the tagline "Good food. Responsibly." is written in a smaller, black, cursive font. Both the logo and tagline are set against a light gray background.

# Endnotes

- <sup>1</sup> “Animal Feeding Operations (AFOs).” EPA. February 16, 2023. <https://www.epa.gov/npdes/animal-feeding-operations-afos#:~:text=AFOs%20that%20meet%20the%20regulatory,waters%20of%20the%20United%20States>.
- <sup>2</sup> Jamie Berger. “How Black North Carolinians pay the price for the world’s cheap bacon.” *Vox*. April 1, 2022. <https://www.vox.com/future-perfect/23003487/north-carolina-hog-pork-bacon-farms-environmental-racism-black-residents-pollution-meat-industry>.
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- <sup>9</sup> “Environmental Justice.” EPA. May 12, 2023. <https://www.epa.gov/environmentaljustice#:~:text=Environmental%20justice%20is%20the%20fair,laws%2C%20regulations%2C%20and%20policies>.
- <sup>10</sup> “Environmental Justice.” EPA. May 12, 2023. <https://www.epa.gov/environmentaljustice#:~:text=Environmental%20justice%20is%20the%20fair,laws%2C%20regulations%2C%20and%20policies>.
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- <sup>12</sup> Jamie Berger. “How Black North Carolinians pay the price for the world’s cheap bacon.” *Vox*. April 1, 2022. <https://www.vox.com/future-perfect/23003487/north-carolina-hog-pork-bacon-farms-environmental-racism-black-residents-pollution-meat-industry>.
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<sup>24</sup> Graddy, Sarah and Al Rabbine. December 1, 2022. Environmental Working Group. EWG analysis: North Carolina's factory farms are everywhere – even floodplains and other flood-prone areas. <https://www.ewg.org/research/ewg-analysis-north-carolinas-factory-farms-are-everywhere-even-floodplains-and-other-flood>.

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**The Rachel Carson Council** is the national environmental organization envisioned by Rachel Carson and founded in 1965 to carry on her work after her death. We promote Carson’s ecological ethic that combines scientific concern for the environment and human health with a sense of wonder and reverence for all forms of life in order to build a sustainable, just, and peaceful future.

**The Rachel Carson Campus Network (RCCN)** links students, faculty, staff, and administrators at campuses nationwide to the Rachel Carson Council to provide and share information and resources, recruit environmental leaders, and work on and off campus to create lasting changes in policy and practice for a sustainable future.



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