

# **Regulation of Hog and Poultry CAFOs in North Carolina: Pollution, Environmental Justice, and Animal Welfare**

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**CAFOs (Concentrated Animal Feeding Operations), also known as factory farms, are by far the dominant method for producing hogs, chickens, and turkeys for meat, and chickens for eggs, in the U.S and in North Carolina. Factory farms supply animal products with a low sticker price but at an unacceptably high cost to public health, the environment, and animal welfare. In North Carolina, CAFOs are disproportionately located in low-income communities and communities of color, where they create adverse health impacts, noxious odors, and unsafe drinking water, making this an important environmental justice issue. Regulations regarding CAFO air and water pollution and their abusive animal confinement practices are weak or non-existent at the federal as well as at the North Carolina state levels. To protect communities, animals, and the environment, North Carolina should enact new regulations and strengthen enforcement of its existing environmental protection laws as they pertain to CAFOs.**

## **1. Legislative priorities<sup>i</sup>**

- Prohibit new CAFOs in the 100-year floodplain
- Incentivize closure or buyouts of existing CAFOs in the 100-year floodplain, including support for CAFO operators to transition to other types of agriculture.
- Create permitting program for poultry CAFOs
- Require disclosure of location and nutrient management plans for all poultry CAFOs
- Require assessment of cumulative impacts of permitting decisions in the permitting process (eg, co-location of hog and poultry CAFOs)
- Require improved odor controls for all CAFOs
- Eliminate gestation crates and battery cages
- Expand funding of the NCDEQ to support permitting and compliance activities
- Incentivize hog CAFOs to adopt ESTs (Environmental Superior Technologies)(.)
- Require that hog CAFOs which sell biogas convert to ESTs

Contact David Waterman with questions ([waterman@indiana.edu](mailto:waterman@indiana.edu))

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## 2. Hog CAFO Pollution

**Hog CAFOs in North Carolina, the nation's 2nd largest producer of pork, are the source of massive air and water pollution, which floods into waterways and affects nearby populations with debilitating, life-shortening disease as well as noxious odors.**

**Technology:** Hog CAFOs create a huge pollution problem for a basically simple reason: The thousands of hogs that a typical, larger CAFO confines into a set of industrial buildings produce a huge quantity of manure that is stored in "lagoons," often covering multiple acres, which not only stink but emit numerous toxins. (In perspective, there are roughly as many hogs as people in North Carolina, and an EPA study reported that livestock produces between 3 and 20 times as much manure as do humans.) Much of the decomposing manure is eventually sprayed onto nearby fields as fertilizer, but there is inadequate agricultural demand for this waste.

**Environmental and health effects:** Many scientific studies have documented the toxic effects of decomposing animal manure on human health and the environment more generally.

Principal airborne toxins include fine particulate matter, ammonia, and sulfur dioxide. These have been linked to chronic bronchitis and other lung diseases, asthma in children, and higher death rates and infant mortality among those who live near or work in CAFOs. Odors from ammonia and hydrogen sulfide, which can reportedly be smelled 5 to 6 miles from hog CAFOs, have been linked to depression and PTSD. Emitted methane and nitrous oxide are also well-known contributors to climate change.

Nitrates from decomposing manure, pathogens such as E Coli, and animal antibiotic residues, can and do leach into well water, potentially leading to serious illnesses or death as well as resistance to antibiotics. Excessive nutrients and other toxins from CAFOs are also a leading contributor to pollution of lakes, rivers and reservoirs, which, among other things, kill fish and cause algae blooms. In North Carolina, a 1995 "operational problem" at a hog CAFO, led to a 25 million gallon spill into the New River. That spill contributed to a 1997 state moratorium on the construction of new hog CAFOs. Then, during Hurricane Floyd in 1999, 5 lagoons burst and 47 others were flooded, spilling waste into the landscape. As a result of Floyd, the state of North Carolina and Smithfield Foods committed to closing a number of hog CAFOs within the 100-year flood plain, but a number still remain. Aerial mapping projects by the Environmental Working Group, Water Alliance and other environmental advocacy organizations showed that Hurricane Matthew in 2016 flooded more than a dozen open pit hog manure lagoons resulting in thousands of acres of manure-saturated farmland. Hurricane Florence in 2018 again led to extensive flooding.

**Environmental justice:** Studies have shown that hog CAFOS are more likely to be found in areas of North Carolina having relatively high concentrations of poverty and of non-white populations, especially Black and indigenous peoples. Inspection of maps reflect these findings, showing that hog CAFOS are densely concentrated in a handful of Eastern North Carolina counties, especially Duplin and Sampson, that have these demographic characteristics. Some researchers have observed that these populations are attractive to industrial hog farmers because they have less political power to resist placement of noxious businesses near them, and that they can least afford to move. These co-locations of communities of color and hog CAFOs have attracted much attention.

**Regulation:** Federal regulation of CAFO air and water pollution by the EPA under the Clean Water Act and the Clean Air Act has been ineffectual; in practice, regulation is largely relegated to states. The North Carolina Department of Environmental Quality is thus responsible for the permitting of hog CAFOs and assuring their compliance, but that agency is widely regarded to be underfunded for adequately monitoring compliance. In any case, the terms and conditions (if any) which govern permits are determined by the North Carolina state legislature, notably including semi-annual farm bills. A number of non-profit activist groups concerned with CAFO regulation assert that the legislature is dominated by the business interests of meat producers, namely Smithfield Foods, which reportedly owns around 200 North Carolina hog CAFOs, and contracts with many others. Smithfield thus dominates pork production in the state, resulting in very ineffectual state regulation of hog CAFOs. The default, then, is inadequate "self-regulation" by Smithfield Foods.

Failures to pass legislation that meaningfully regulate hog CAFOs are illustrated by the response to new technologies that can help resolve pollution concerns or meet environmental justice objectives.

### **Responses to new technology**

**ESTs:** Following Hurricane Floyd flooding in 1999, Smithfield provided funding in 2000 to investigate "economically feasible" alternatives to the "lagoon and spray" system" for hog manure storage and disposal. Several "Environmentally Superior Technologies" (ESTs) were developed in response. Some of these were shown to dramatically reduce pollution, but none were as cheap as the existing "lagoon and spray" system, and virtually none of these ESTs has been adopted by any North Carolina hog CAFOs to date.

**Biogas:** Around 2007, experiments to capture methane from hog CAFO lagoons and convert it to electricity were begun. The so-called "biogas" industry began in earnest in 2018 with a joint venture between Smithfield and Dominion Energy to capture CAFO methane gas by covering a group of Smithfield lagoons with "anaerobic digesters" and then piping the methane to a central facility for purification and finally converting it to natural gas that Dominion would sell to its customers, compensating Smithfield for their supply.

The 2021 Farm bill called for general permits to be granted to applying CAFOs to install digesters to capture methane for sale, thus creating a new source of income, and higher profits, for pork suppliers. After a comment period these one-size-fits-all general permits were approved by NCDEQ in July 2022.

While capturing methane in itself is beneficial to the environment, some activists have objected to the general permitting of biogas technology because it entrenches the lagoon and spray system and its environmental hazards, including environmental injustice. Further, the digesters fail to mitigate many co-pollutants and actually increase nitrous oxide and ammonia emissions. By creating a new stream of profits, biogas serves to further entrench the industry. Biogas operations are also not immune to accidents, as shown by a major spill after a digester system ruptured in May of 2022.

### **3. Poultry CAFO Pollution**

**Poultry is the largest farm animal production industry in the state, and North Carolina is the 2<sup>nd</sup> largest poultry producing state in the U.S. Poultry CAFOs have nevertheless attracted much less attention in North Carolina, yet they pose serious pollution and public health concerns, are rapidly growing, and are subject to almost no state regulation whatsoever.**

**Technology:** Similar to hog CAFOs, laying hens, “broilers” and turkeys are confined in very large facilities, often with over a hundred thousand birds per farm. Mostly “dry litter” is produced, consisting of manure, feathers, and bedding, that is stored in large piles before application to farms, but quantities available outstrip fertilizer demand.

**Pollution, health, and environmental justice.** Dry litter mounds contain many of the same excessive nutrients, pathogens and antibiotics as hog waste, and are also subject to leaching into ground water and flooding into waterways. Dry litter also generates odors due to airborne toxins, notably ammonia. A similar range of respiratory diseases, including pneumonia, along with headaches and nausea, are known to affect nearby humans. There is also credible evidence that poultry CAFOs contribute to environmental injustice, since aerial Environmental Working Group/Water Alliance maps show that about a third of them are located in the same 47 Eastern North Carolina counties (and especially within Duplin and Sampson), that house the overwhelming majority of hog CAFOs. EWG also reported that from 2008 to 2018, the number of poultry CAFOs in North Carolina increased by approximately 19%. An investigative report by the Charlotte Observer and the Raleigh News & Observer published in December 2022 refined these maps, identifying a total of over 4600 poultry CAFOs in the state—a number of them in flood plains--and reported a 17% growth in the number of chickens and turkeys raised in the state between 2016 to 2021.

**Regulation.** Poultry CAFOs in North Carolina are “deemed permitted,” so that the NCDEQ has virtually no regulatory authority over them, and in fact has very little information about them, including even where they are located. A comparison by the 2022 newspaper investigation of North Carolina with 10 other states, including 6 of the largest poultry producing states, found that North Carolina required disclosure of less information about poultry CAFOs than any of the other states.

#### **4. Animal Welfare**

**CAFOs have long been criticized by animal welfare advocates for cruel treatment of animals. There are no North Carolina or federal laws to protect animals in CAFOs.**

**Animal life in CAFOs:** Hogs, chickens, turkeys, and other farm animals are sentient beings capable of feeling pain as well as pleasure. The short lives of these animals in CAFOs, however, are filled with pain, and they are generally unable to express even minimal natural behaviors. Gestation crates for hogs are so small that pregnant or nursing sows cannot even turn around. “Battery cages” for egg laying hens provide a space smaller than an 8 by 11 sheet of paper for each animal for their entire lives. Baby piglets have their tails docked and chickens their beaks broken, all with no anesthesia.

**Legal protections in North Carolina:** All farm animals are exempted from animal cruelty statutes, resulting in no protections. (In 2007, Smithfield voluntarily committed to phasing out gestation crates at the CAFOs they own nationwide, and they announced in 2018 that this transition has been completed. The Humane Society of the U.S., however, filed suit against Smithfield in 2021, alleging that gestation crates are still in use and that Smithfield has mis-represented this transition to their consumers.)

**Legal protections elsewhere:** The ASPCA lists 14 states that have passed legislation, or where ballot measures have been passed banning at least some cruel forms of confinement. Notable is California, where Proposition 12, a ballot measure banning, among other things, the in-state sale of any meat or other animal products where gestation crates or battery cages were utilized. Throughout Western

Europe, where a strong tradition of farm animal protection dates back to the 1960s, bans are in place that prevent the sale, among other things, of any animal products derived from gestation crates or battery cages.

**Animal welfare advocacy:** A number of non-profit organizations in the U.S. (e.g., the Humane League, Mercy for Animals, the Humane Society, and the ASPCA) advocate for farm animal protections at the state and national levels. Quakers also have a history of animal rights advocacy. The Anti-vivisection Association (now Quaker Concern for Animals) was founded in England in 1891, and individual Quakers in the U.S. have been influential in the animal rights movement since the early 20<sup>th</sup> Century.

## 5. Selected References

ASPCA, Farm animal confinement bans by state, <https://www.asPCA.org/improving-laws-animals/public-policy/farm-animal-confinement-bans> accessed December 23, 2022.

Azhar, A. Pollution from NC's commercial poultry farms disproportionately harms communities of color, **Inside Climate News**, October 13, 2021, <https://insideclimatenews.org/news/13102021/north-carolina-commercial-poultry-farms-justice-communities-of-color/>

Big Poultry in North Carolina, Investigative report by the Charlotte Observer and the Raleigh News & Observer, December, 2022.

Bless the Beasts, **Swarthmore College Bulletin**, Winter, 2019  
<https://www.swarthmore.edu/bulletin/archive/winter-2019-issue-ii-volume-cxvi/bless-beasts.html>

Clean Water for North Carolina: <https://cwfnc.org/project/factory-farms/> (Poultry Operations); accessed December 23, 2022.

Environmental Working Group, Exposing Fields of Filth: After Hurricane, First Detailed Look at Flooding of Feces-Laden N.C. Factory Farms, November 4, 2016, <https://www.ewg.org/research/exposing-fields-filth>

Environmental Working Group, Under the Radar: New Data Reveals N.C. Regulators Ignored Decade-Long Explosion of Poultry CAFOs, Feb. 19, 2019 <https://www.ewg.org/research/under-radar>

Hog farm waste spill raises questions about NC regulations, **The News & Observer**, Sept. 6, 2022. P. 1.

Hribar, C., Understanding Concentrated Feeding Operations and their impact on communities, National Association of Local Boards of Health, 2010.  
[https://www.cdc.gov/nceh/ehs/docs/understanding\\_cafos\\_nalboh.pdf](https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf)

Miller, D. and R. Longest, Reconciling Environmental Justice with Climate Change Mitigation: A Case Study of NC Swine CAFOs, **Vermont Journal of Environmental Law**, Vol. 21, 2020.  
[https://scholarship.law.duke.edu/faculty\\_scholarship/4034/](https://scholarship.law.duke.edu/faculty_scholarship/4034/)

Nicole, W., CAFOs and Environmental Justice: The case of North Carolina, **Environmental Health Perspectives**, Vol. 121, No. 6, June, 2013. <https://ehp.niehs.nih.gov/doi/10.1289/ehp.121-a182>

North Carolina Council of Churches, Eco-Justice Committee, Biogas and Communities Webinar, Part 1, October 19, 2021: <https://www.youtube.com/watch?v=b7sUssWa6LQ>; Part 2, November 2, 2021: <https://www.youtube.com/watch?v=o-eD66rAlKA&t=691s>

Oglesby, C., NC Releases general biogas permit despite environmental Justice concerns, **Southerly**, July 12, 2022.

Pew Commission on Industrial Farm Animal Production in America, Putting Meat on the Table: Industrial Farm Animal Production in America, 2010; Animal Welfare, pp. 31-39

<https://www.pewtrusts.org/en/research-and-analysis/reports/0001/01/01/putting-meat-on-the-table>

Raff, Z., A Meyer, CAFOs and Surface Air quality: Evidence from Wisconsin, **American Journal of Agricultural Economics**, Vol. 104, Issue 1, 2021

<https://onlinelibrary.wiley.com/doi/epdf/10.1111/ajae.12222>

Rogers, S., and J. Haines, Detecting and mitigating the environmental impact of fecal pathogens originating from Concentrated Animal Feeding Operations: Review, Environmental Protection Agency September, 2005

Sneeringer, S., A National Longitudinal Study of the Effects of Concentrated Hog Production on Ambient Air Pollution, **American Journal of Agricultural Economics**, Vol. 92, 2010, p. 821-835.

<https://www.jstor.org/stable/40648022>;

Southern Environmental Law Center, Industrial Animal Operations,

<https://www.southernenvironment.org/topic/pollution-from-industrial-animal-operations/> accessed December 23, 2022.

Wing, S, D. Cole, G. Grant, Environmental Injustice in North Carolina's Hog Industry

**Environmental Health Perspectives** Vol. 108, No. 3 (Mar., 2000), pp. 225-231;

<https://www.jstor.org/stable/3454438>

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