

## CAFOs: An Industrial-Sized Pollution Problem



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### *Abstract*

Today most meat Americans consume comes from factory farms known as Confined Animal Feeding Operations (CAFOs). CAFOs house thousands to millions of animals in close quarters; this paradigm permits large-scale meat production, but pollutes soil, air, and groundwater. CAFOs do not bear the costs of their pollution: favorable government policies and lax environmental regulation allow them to externalize their costs to society. CAFO pollution represents a market failure as well as an unconscionable threat to human health and the environment. The government must stop subsidizing CAFOs and strictly regulate their pollution. Otherwise, their unabashed environmental harms will continue.

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The methods of livestock farming in the United States have changed dramatically over the past few decades. Starting with broiler chickens, raising animals for food has left the ambit of small farms for industrial-scale operations.<sup>i</sup> (Burkholder, 2007). Today the majority of our meat comes from industrial factory farms known as Confined Animal Feeding Operations (CAFOs). CAFOs differ from traditional livestock rearing by their size, high-density confined animal population, and reliance upon grain for animal feed.<sup>ii</sup> (Osterberg, 2004). Compared to traditional farms, the CAFO industry is heavily concentrated: four companies produce 81 percent of our beef, 73 percent of our total sheep, 57 percent of our pigs, and 50 percent of our chickens in CAFOs.<sup>iii</sup> (Antitrust Enforcement Improvement Act of 2000). Three percent of America's hog CAFOs produce more than fifty percent of our pork.<sup>iv</sup> (Mallon, 2005).

CAFOs house animals from the thousands to the millions in very tight quarters.<sup>v</sup> (Stokstad, 2008). Mazes of corrals the size of a city block house tens of thousands of cattle; egg-laying chickens live packed in cages so tightly that they cannot stretch a wing.<sup>vi</sup> (Windham, 2007; Pollan, 2006). The dense, overcrowded conditions at CAFOs, combined with their frequent geographic co-location, pollute the environment and harm public health. However the impacts of industrial animal production are not borne by CAFOs themselves; they are externalized

through water pollution, air pollution, increased pathogen resistance, and degraded health and quality of life for those in their vicinity. This paper will discuss the externalities surrounding CAFOs, the policies and regulations that entrench the CAFO paradigm, and the need to change the status quo.

### Externalities


CAFOs exert negative external effects on society and the environment through their pollution. Negative external effects from CAFOs are properly classified as externalities because the private cost to CAFOs for these effects is less than the social cost, and the social cost is at an inefficient level.<sup>vii</sup> (Morey, 2008). An inefficient level of market allocation allows an actor to benefit at the expense of others, i.e. he enjoys a ‘free ride’ despite making others worse off in the process. (*Id.*). By shifting the hazards of their production methods onto society and the environment, CAFOs avoid paying for the harm they cause.<sup>viii</sup> (Gurian-Sherman, 2008). Indeed, CAFOs are getting the proverbial ‘free ride;’ they do not even offer parties that suffer from their pollution a choice to avoid it. Until CAFOs’ private cost of polluting increases to the social cost, this market failure will persist. Accordingly, to the extent that CAFOs reduce their pollution by absorbing its costs, their mistreatment of the commons and public health should diminish.

### Pollution Outputs

High animal density lies at the heart of CAFO pollution. CAFOs generate prodigious amounts of manure. In the United States, the amount of manure CAFOs produce annually exceeds the amount of human waste produced in the same timeframe by three times.<sup>ix</sup> (Osterberg, 2004). Storage and disposal of such quantities of manure at CAFOs is problematic. Regional environmental health suffers because manure contaminants “readily move offsite in water and air.”<sup>x</sup> (*Id.*).

Manure can be a valuable fertilizer when applied to crops at a concentration soil can absorb, as occurs on small and mid-sized farms.<sup>xi</sup> But manure becomes a significant source of pollution if it is over-applied to fields, and if its components enter the air and water.<sup>xii</sup> (Gurian-Sherman, 2008). CAFOs routinely spray manure on nearby fields in amounts far beyond their capacity to absorb it, transforming what is ordinarily a source of fertility into toxic waste.<sup>xiii</sup> (Windham, 2007). It is impossible to completely dispense CAFO manure onto nearby fields; there is far too much of it. Nor can the manure cannot be economically transported for use at other locations due to its sheer quantity and weight. Instead, CAFOs store manure mixed with urine and water on site in open-air lagoons or underground containers.<sup>xiv</sup> (Gurian-Sherman, 2008). On-site storage invariably pollutes the environment through leakage, stormwater runoff, volatilization of nitrogen, and catastrophic failure of containment structures.<sup>xv</sup> (Burkholder, *et al.*, 2007). As a result, populations who live in proximity to CAFOs are exposed to higher levels of water pollution, harmful airborne particulates, and pathogens.<sup>xvi</sup> (Gurian-Sherman, 2008).

The most severe pollution from CAFOs occurs from manure entering surface and ground water. Manure contaminants include nitrogen, phosphorous, pathogens, veterinary pharmaceuticals, heavy metals, and hormones.<sup>xvii</sup> (Burkholder, *et al.*, 2007). Microbes in water from manure contamination have caused serious outbreaks of disease. America's largest waterborne disease event to date involved runoff from dairy feedlots near Milwaukee, sickening over 400,000 people and killing 54.<sup>xviii</sup> (Osterberg, 2004). The cost to aquatic ecosystems is also severe: between 1990 and 2000, water pollution from livestock agriculture caused more fish kills than municipal and industrial pollution combined.<sup>xix</sup> (Stokstad, 2008).

The effect of air emissions from CAFOs on workers and neighboring communities is a growing concern.<sup>xx</sup> (Osterberg, 2004). Workers suffer ill effects from manure sses, odors,

dust, bacteria, and endotoxins.<sup>xxi</sup> (*Id.*). According to the American Lung Association, 58 percent of all swine CAFO workers experience chronic bronchitis, and nearly 70 percent experience some form of respiratory irritation.<sup>xxii</sup> (Schrum, 2005). The volatilization of ammonia into the atmosphere from nitrogen in manure is of particular concern.<sup>xxiii</sup> (Gurian-Sherman, 2004). Up to 70 percent of the nitrogen in CAFO manure can be lost to the atmosphere.<sup>xxiv</sup> (Walker, *et al.*, 2000). Volatilized nitrogen often returns to the ground through deposition within 80 km of its origin, compounding terrestrial and water pollution.<sup>xxv</sup> (*Id.*). The amount of ammonia deposition in regions with large numbers of CAFOs has risen dramatically over the past several decades, to the extent that it may “exceed the capacity of forests and other environments to utilize it without harm.”<sup>xxvi</sup> (Gurian-Sherman, 2008).

The overwhelming odors that emanate from CAFOs can span a radius of several miles. This has forced many neighbors to cease outdoor activity, and some to live in their basements to escape nausea and asthma.<sup>xxvii</sup> (Schrum, 2005). Odor and pollution lower property values in the vicinity of CAFOs.<sup>xxviii</sup> (Gurian-Sherman, 2008). A University of Missouri study by the College of Agriculture, Food, and Natural Resources determined that each individual CAFO in a given area lowered surrounding regional property value by an average of \$2.68 million.<sup>xxix</sup> (Gurian-Sherman, 2008). Since CAFOs are typically co-located in clusters, this equates to significant overall reduction in property value.

Another particularly worrisome CAFO by-product is increased antibiotic resistance in pathogens. Antibiotic-resistant bacteria exist at higher concentrations in soil and air emissions from CAFOs.<sup>xxx</sup> (Osterberg, 2004). To combat disease outbreaks from overcrowding and to promote faster growth, CAFOs administer antibiotics to their entire animal population regardless of health. Estimates of antibiotic usage in U.S. industrial animal populations range from forty to

eighty-seven percent of our *entire country's* usage.<sup>xxxii</sup> (Gilchrist, *et al.*, 2007). As much as seventy-five percent of the antibiotics administered to animals at CAFOs are excreted in their urine and feces, which then escapes into soil, air, and water.<sup>xxxiii</sup> (Osterberg, 2004). In addition to these avenues, humans and animals also absorb antibiotics and resistant bacteria by consuming antibiotic-laden meat.<sup>xxxiii</sup> (Osterberg, 2004).

The potential public health impacts of decreased antibiotic efficacy are alarming. Today, multi-drug resistant pathogens have become a problem in CAFOs, particularly in poultry and swine operations.<sup>xxxiv</sup> (Gilchrist, 2007). A 2008 Louisiana State University study of Baton Rouge grocery stores determined that 5 of 90 retail pork samples tested positive for Methicillin Resistant *Staphylococcus aureus* (MRSA), a particularly dangerous antibiotic-resistant staph infection once only found in hospitals.<sup>xxxv</sup> (Pu, *et al.*, 2009). Initial analysis by veterinarian and swine disease researcher Peter Davies indicates that up to 39 percent of American hogs carry MRSA; he believes his research will ultimately yield a value on par with the 70 percent known incidence rate in Canada.<sup>xxxvi</sup> (Davies, 2008). Why hasn't the United States followed the lead of other nations that have banned nontherapeutic use of antibiotics on livestock? Agribusiness interests have consistently and successfully resisted such a ban. Considering the risks to public health, continued indiscriminate use of antibiotics to perpetuate crowded, unsanitary conditions at CAFOs is unconscionable.<sup>xxxvii</sup>

### CAFO Subsidies and Regulation

The predominance of CAFOs is not simply the result of market forces. CAFOs have largely supplanted smaller farming operations through government policies that favor consolidated, industrial operations. Enormous subsidies for grain inputs -- exceeding thirty billion dollars a year -- offset the cost of animal feed.<sup>xxxviii</sup> (Windham, 2007). This provides

CAFOs substantially reduced operation costs: feed accounts for about 60 percent of the cost of producing hogs and chickens at CAFOs and a substantial percentage of beef and dairy production.<sup>xxxix</sup> (Gurian-Sherman, 2008). Federal policies facilitate the production of cheap grain for these operations through taxpayer-funded subsidies that compensate grain farmers for low prices -- even prices below the cost of production.<sup>xi</sup> (*Id.*)

In addition to grain subsidies, CAFOs also receive subsidies, ironically, for environmental clean-up. The federal Environmental Quality Incentives Program (EQIP) pays the CAFO industry more than \$100 million per year to reduce their environmental damage.<sup>xii</sup> (Gurian-Sherman, 2008). During its first seventeen years, EQIP was aimed at smaller farming operations. In 2002, EQIP was modified to include CAFOs, which now receive far more funding than smaller farms.<sup>xlii</sup> (*Id.*) Taxpayers are further encumbered by CAFO-related environmental remediation projects. For example, remediation of manure pollution from dairy and hog CAFOs in Kansas will cost taxpayers upwards of \$56 million (consider that Kansas doesn't even rank among the top hog or dairy producers).<sup>xliii</sup> (Gurian-Sherman, 2008). Using this figure, the total potential cost of soil remediation for hog and dairy CAFOs in the U.S. could exceed \$4.1 billion.<sup>xliv</sup> (*Id.*)

The favored circumstances that CAFOs enjoy have led to pronounced vertical and horizontal integration within the industry.<sup>xlv</sup> (Stokstad, 2008). The meat processing industry is one of the most concentrated in the U.S.<sup>xlvi</sup> (Stokstad, 2008). In addition to CAFOs' near oligopoly in livestock production, a handful of very large animal processors control animal slaughter through ownership or contracting arrangements.<sup>xlvii</sup> (Gurian-Sherman, 2008). Such concentration may precipitate market failure through price manipulation, discrimination among

producers, and the ability to entrench and exploit market power.<sup>xlvi</sup> (Testimony of Professor Peter Carstensen before the United States Senate Committee on the Judiciary, 2003).

To the extent that CAFOs externalize their costs, they enjoy another form of subsidy.<sup>xlix</sup> (Gurian-Sherman, 2008). Lax industry regulations allow CAFOs to dodge the costs of their pollution and health hazards. Compared to other industry like mining, manufacturing, power generation, etc., industrial agriculture has benefitted from a very friendly regulatory environment.<sup>1</sup> Until recently, federal regulations on CAFO pollution have been some of the “least enforced, least effective national standards ever.”<sup>li</sup> (Braunig, 2005).

In 2003, the Environmental Protection Agency (EPA) promulgated new regulations including CAFOs as point sources under the Clean Water Act (CWA).<sup>lii</sup> (2003 Final CAFO Rule). As point sources, CAFOs are subject to effluent limitations, permitting, and nutrient management plans. (*Id.*) Under the current regulatory scheme, however, the EPA only requires CAFOs *actively* discharging, or *proposing to* discharge effluent to seek a CWA permit.<sup>liii</sup> (EPA 2008 Final CAFO Rule). CAFOs lacking actual contamination data (a routine occurrence) are thus given wide discretion to seek a permit.<sup>liv</sup> (Gurian-Sherman, 2008).

In 2005, the EPA released the Animal Feeding Operations Consent Agreement and Final Order (AFO CAFO), a voluntary industry-funded air emissions monitoring regime.<sup>lv</sup> (70 Fed. Reg. 4). The intent of the Order is to benchmark CAFO air emissions to enact stricter future regulation. The AFO CAFO is a step in the right direction for addressing CAFO air pollution, albeit a baby step. Due to the Order’s voluntary nature -- and *waiver of liability* for past and ongoing environmental violations in exchange for participation -- critics assail the AFO CAFO as a “sweetheart deal.”<sup>lvi</sup> (Merrill, 2008).

Other “command and control,” or top-down, regulation applicable to CAFOs includes the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Emergency Planning and Community Right-to-Know Act (EPCRA).<sup>lvii</sup> Both attempt to protect the public from the release of hazardous substances. However, these regulations have not been brought to bear upon CAFOs in any meaningful way.<sup>lviii</sup> (Merrill, 2008). The regulations also permit citizens to sue CAFOs for hazardous releases if their interests have been affected. Citizen suits can be an effective means of exposing polluters, but their effect is diminished for CAFOs participating in the AFO CAFO program because they are granted immunity from them.

### Conclusion

Society unjustly bears the burden of CAFO pollution. CAFO proponents argue that factory farming represents an efficient means of meat production. To date, the government has thoroughly capitulated to the factory farming lobby, allowing CAFOs to operate virtually free of constraint. However, CAFOs maximize their efficiency at too great a cost. “The industrial animal factory offers a nightmarish glimpse of what capitalism is capable of in the absence of any moral or regulatory constraint whatsoever.”<sup>lix</sup> (Pollan, 2006). The CAFO imperative to maximize efficiency must be tempered by moral considerations. Though pollution from CAFOs largely falls within the confines of present (and woefully inadequate) regulation, moral fault for its harms inheres to industry and to the government for allowing it to continue unabated.

The environmental destruction that CAFOs thrust upon society does not comport with any definition of good environmental stewardship. CAFOs produce societal harms that clearly defy celebrated naturalist and Sierra Club founder John Muir’s ideal of environmental preservation. The CAFO “ethic” of maximal production at any cost falls far short of



environmental ethicist Aldo Leopold's land ethic, which asserts that a pursuit is "right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."<sup>lx</sup> (Leopold, 1949). CAFOs even offend conservation ethicist Gifford Pinchot's market-friendly platform of responsible resource use for the service of man.<sup>lxi</sup> Indeed, it is hard to imagine any reasonable, ethical environmental bar that CAFOs could reach in their present embodiment. It is outrageous that the low bar set by our government shamelessly panders to industry and perpetuates market failure.

Some believe that human health and environmental violations of CAFOs are so high that they should be categorically eliminated.<sup>lxiii</sup> (Mallon, 2005). Economic efficiency does not dictate that outcome (though moral compunction may). At a minimum, industrial animal production must absorb its externalities and compete on the same playing field as smaller, more sustainable forms of farming. The incentive structure and regulatory framework under which CAFOs currently operate perpetuates their externalities. Consequently, subsidies that confer a competitive advantage to CAFOs should be discontinued. Further regulation must be promulgated to reduce CAFO pollution to an efficient level. Fairness, economic efficiency, and common decency dictate that CAFOs should absorb the cost of their harms; their free ride must come to an end.

## ENDNOTES

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- <sup>i</sup> Burkholder, JoAnne, *et al.* “Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality.” *Environmental Health Perspectives*, vol. 115, no. 2, Feb. 2007 at 308.
- <sup>ii</sup> Osterberg, David and David Wallinga. “Addressing Externalities From Swine Production to Reduce Public Health and Environmental Impacts.” *American Journal of Public Health*, vol. 94, no. 10, Oct 2004, at 1703 available at <http://www.ajph.org/cgi/reprint/94/10/1703> ; see also Gurian-Sherman, Doug. “CAFOs Uncovered: the Untold Costs of Animal Feeding Operations.” Union of Concerned Scientists, 2008 at 13, available at [http://www.ucsusa.org/assets/documents/food\\_and\\_agriculture/cafos-uncovered.pdf](http://www.ucsusa.org/assets/documents/food_and_agriculture/cafos-uncovered.pdf) .
- <sup>iii</sup> Testimony of Leland Swenson, president of the U.S. National Farmers' Union, on Antitrust Enforcement Improvement Act of 2000, before the House Judiciary Committee, September 12, 2000 at 61, available at [http://commdocs.house.gov/committees/judiciary/hju67334.000/hju67334\\_of.htm](http://commdocs.house.gov/committees/judiciary/hju67334.000/hju67334_of.htm) .
- <sup>iv</sup> Mallon, Robyn. “The Deplorable Standard of Living Faced by Farmed Animals in America’s Meat Industry and How to Improve Conditions by Eliminating the Corporate Farm.” *Michigan State University Journal of Medicine and Law*, Summer 2005 at 396.
- <sup>v</sup> Stokstad, Paul. “Enforcing Environmental Law in an Unequal Market: the Case of Concentrated Animal Feeding Operations.” *Missouri Environmental Law and Policy Review*, Spring 2008 at 231; see also [www.sierraclub.org/factoryfarms](http://www.sierraclub.org/factoryfarms) (the Sierra Club is a non-profit organization founded in 1892 by naturalist John Muir; its aims include protection of wilderness areas, responsible use of natural resources, and educate about environmental protection).
- <sup>vi</sup> Windham, Jodi Soyers. “Putting Your Money Where Your Mouth Is: Perverse Food Subsidies, Social Responsibility & America’s 2007 Farm Bill.” *Environs Environmental Law and Policy Journal*, Fall 2007 at 21. Pollan, Michael. *The Omnivore’s Dilemma*. Penguin Books, 2006 at 318.
- <sup>vii</sup> Morey, Edward R. “An Introduction to Market Failures.” Feb. 14, 2008 at 10, available at <http://www.colorado.edu/economics/morey/4545/introductory/marketfailures.pdf> .
- <sup>viii</sup> Gurian-Sherman, Doug. “CAFOs Uncovered: the Untold Costs of Animal Feeding Operations.” Union of Concerned Scientists, 2008 at 1, available at [http://www.ucsusa.org/assets/documents/food\\_and\\_agriculture/cafos-uncovered.pdf](http://www.ucsusa.org/assets/documents/food_and_agriculture/cafos-uncovered.pdf) .
- <sup>ix</sup> Osterberg, *supra*, note 4 at 1703.
- <sup>x</sup> *Id.* at 1704.
- <sup>xi</sup> Burkholder, *supra* note 1 at 308.

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- <sup>xii</sup> Gurian-Sherman, *supra*, note 8 at 9.
- <sup>xiii</sup> Windham, *supra* note 6 at 21.
- <sup>xiv</sup> Gurian-Sherman, *supra* note 8 at 14.
- <sup>xv</sup> Burkholder, *supra* note 1 at 309.
- <sup>xvi</sup> Gurian-Sherman, *supra* note 8, at 60.
- <sup>xvii</sup> Burkholder, *supra* note 1 at 308.
- <sup>xviii</sup> Osterberg, *supra* note 9 at 1704.
- <sup>xix</sup> Stokstad, *supra* note 5 at 239. *See also* Gurian-Sherman, *supra* note 8 at 52.
- <sup>xx</sup> Osterberg, *supra* note 9 at 1705.
- <sup>xxi</sup> *Id.* at 1707.
- <sup>xxii</sup> Schrum, Christine. “Hog Confinements Kill Communities.” *Iowa Source*. Sept. 2005, available at [http://www.iowasource.com/health/CAFO\\_people\\_0905.html](http://www.iowasource.com/health/CAFO_people_0905.html) .
- <sup>xxiii</sup> Gurian-Sherman, *supra* note 8 at 3.
- <sup>xxiv</sup> Walker, John T. *et al.* “Atmospheric Transport and Wet Deposition of Ammonium in North Carolina.” *Atmospheric Environment*, vol. 34, no. 20 (2000) at 3408.
- <sup>xxv</sup> *Id.* at 3416
- <sup>xxvi</sup> Gurian-Sherman, *supra* note 8 at 4.
- <sup>xxvii</sup> Schrum, *supra* note 22.
- <sup>xxviii</sup> Gurian-Sherman, *supra* note 8 at 60.
- <sup>xxix</sup> *Id.* at 5.
- <sup>xxx</sup> Osterberg, *supra* note 9 at 1706.
- <sup>xxxi</sup> Gilchrist, Mary *et al.* “The Potential Role of Concentrated Animal Feeding Operations in Infectious Disease Epidemics and Antibiotic Resistance.” *Environmental Health Perspectives*, vol. 115, no. 2, Feb. 2007 at 313.
- <sup>xxxii</sup> Osterberg, *supra* note 9 at 1705.

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<sup>xxxiii</sup> *Id.* at 1705-06.

<sup>xxxiv</sup> Gilchrist, *supra* note 31 at 314.

<sup>xxxv</sup> Pu, Shuaihua, *et al.* “Isolation and Characterization of Methicillin-Resistant *Staphylococcus aureus* Strains from Louisiana Retail Meats.” *Applied and Environmental Microbiology*, vol. 75, no. 1, Jan 2009 at 265-67.

<sup>xxxvi</sup> Davies, Peter, *et al.* “MRSA and swine veterinarians? Results from AASV member survey.” American Association of Swine Veterinarians. 13 May 2008, *available at* <http://www.aasv.org/news/story.php?id=3010> . *See also* Kristof, Nicholas D. “Pathogens in Our Pork.” *New York Times*, 14 March 2009, *available at* [http://www.nytimes.com/2009/03/15/opinion/15kristof.html?\\_r=1&em](http://www.nytimes.com/2009/03/15/opinion/15kristof.html?_r=1&em) .

<sup>xxxvii</sup> For a sobering story on MRSA’s ability to resist medical science’s current array of antibiotics, see Linda Lohsen’s account of her daughter’s death, “Rebecca’s Story,” from the Infectious Diseases Society of America, *available at* <http://www.idsociety.org/Content.aspx?id=7012> .

<sup>xxxviii</sup> Windham, *supra* note 6 at 28.

<sup>xxxix</sup> Gurian-Sherman, *supra* note 8 at 2.

<sup>xl</sup> *Id.* at 3.

<sup>xli</sup> *Id.* 29.

<sup>xlii</sup> *Id.* at 40. For example, in Iowa and North Carolina (states with the largest number of swine CAFOs), primary eligibility for fund allocation for water quality and waste storage favored counties with the highest concentration of swine CAFOs.

<sup>xliii</sup> *Id.* at 4.

<sup>xliv</sup> *Id.*

<sup>xlv</sup> Stokstad, *supra* note 5 at 234.

<sup>xlvi</sup> *Id.* at 235.

<sup>xlvii</sup> Gurian-Sherman, *supra* note 8 at 19.

<sup>xlviii</sup> Monopsony Issues in Agriculture: Buying Power of Processors in Our Nations’ Agricultural Markets, Hearing before the Sen. Judiciary Comm. (Oct. 30, 2003). (testimony of Peter Carstensen), *available at* [http://judiciary.senate.gov/hearings/testimony.cfm?id=975&wit\\_id=2782](http://judiciary.senate.gov/hearings/testimony.cfm?id=975&wit_id=2782) .

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<sup>xlix</sup> Gurian-Sherman, *supra* note 8 at 5, 41.

<sup>l</sup> Even at the state level, government is reticent to tighten the vise on CAFOs. In Iowa, it is legal for a 7-acre manure lagoon to leak up to *16 million gallons* annually (*see* Schrum, *supra* note 22).

<sup>li</sup> Braunig, Warren A. “Reflexive Law Solutions for Factory Farm Pollution.” *New York University Law Review*, Nov 2005 at 1514.

<sup>lii</sup> 68 Fed. Reg. 7176-01, 7183 (Feb 12, 2003). This regulation is still pretty weak – it didn’t impose strict numerical effluent limitations (to which point sources are ordinarily subject), but rather permits nebulous “best management practices.” Also, large CAFOs are exempt from obtaining a permit if they can demonstrate they have never discharged. The court in *Waterkeeper Alliance v. EPA*, 399 F.3d 486 (C.A. 2 2005), held that since the CWA regulates only actual, and not potential, discharges, the EPA could not require all CAFOs to apply for permits. Finally, the CWA does not regulate ammonia, one of the most pernicious contaminants released from CAFOs, nor does it regulate odors.

<sup>liii</sup> EPA 2008 Final CAFO Rule, Consolidated Concentrated Animal Feeding Operations (CAFO) Regulations, available at [http://www.epa.gov/npdes/regulations/cafo\\_final\\_rule2008\\_comp.pdf](http://www.epa.gov/npdes/regulations/cafo_final_rule2008_comp.pdf).

<sup>liv</sup> Gurian-Sherman, *supra* note 8 at 53.

<sup>lv</sup> Animal Feeding Operations Consent Agreement and Final Order, 70 Fed. Reg. 4, 958 (Jan 31, 2005).

<sup>lvi</sup> Merrill, Benjamin R. “What Stinks ... the Animal Feeding Operations Consent Agreement and Final Order or EPA Involvement in the Area?” *Drake Journal of Agricultural Law*, Spring 2008 at 286-87.

<sup>lvii</sup> CERCLA, 42 U.S.C. §§ 9601-9675 (1994); ECPRA, 42 U.S.C. §§ 11001-11050 (1994).

<sup>lviii</sup> Merrill, *supra* note 54 at 292.

<sup>lix</sup> Pollan, Michael. The Omnivore’s Dilemma. Penguin Books, 2006 at 318.

<sup>lx</sup> Leopold, Aldo. *A Sand County Almanac*. 1949.

<sup>lxi</sup> For more information on Pinchot’s permissive “conservation ethic,” *see* Posewitz, Jim. “Return to Root Ideals.” *Headwaters News*, 9 Nov 2006, available at <http://www.headwatersnews.org/p.Look.USFS110906.html> ; *see also* Wikipedia’s page on Pinchot, available at [http://en.wikipedia.org/wiki/Gifford\\_Pinchot](http://en.wikipedia.org/wiki/Gifford_Pinchot) .

<sup>lxii</sup> Mallon, *supra* note 3 at 406.

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### **COMMENTS ON FEEDBACK FROM MENTORS – first draft submission (27 Feb)**

During my drafting of this paper, I have benefitted from Hunter's and Adam's feedback. Both provided comments on the substance of the paper, its logical flow, and suggestions on how to improve it. Both sent me documents with embedded changes and suggestions. The group of us also met up in person and spoke over the phone on a few occasions.

Specifically, Hunter identified areas in my document that did not transition smoothly. I accepted all his suggestions for that. He suggested I move statistics on CAFO production from the middle of the document to the beginning (which I did). He also suggested I consider Singer's philosophy on animal rights. (We chatted about this, but I opted not to address animal rights in this paper. In my estimation, that topic merits treatment of its own, and I didn't want to give it short shrift.) He suggested I expound on some of the regulations I cited (which I did). Finally, Hunter was very helpful in identifying spelling and grammar oversights. Overall, I found his feedback on my paper thorough and thoughtful.

I also received a document with embedded comments from Adam. He has a keen eye for spelling and grammar mistakes, which I tend to overlook. He and I discussed the subject of CAFOs in general, what aspects of them are most troubling, and what level of detail seemed appropriate to cover in the paper. He provided clarification on my economic assertions (I struggled with that part of the paper because I am not familiar discussing it). Adam proposed that I address the government's motivation in its generous support of CAFOs. I can only speculate on the reasons behind the government's actions, but it is an intriguing tangent. I will consider addressing it if I receive feedback from you that my paper lacks depth. I likewise found Adam's contribution to my paper thorough and thoughtful.

As mentors overall, I feel that both Adam and Hunter performed well and took their task seriously.

### **COMMENTS ON FEEDBACK FROM MENTORS – final draft submission (15 Mar)**

Because we had guidance on what parts of our paper needed improvement from you, the group's mutual time investment was not as high in this iteration. But we still conferred with one another.

Adam and I got together for over two hours to exchange comments on our essays. Since then, Hunter, Adam, and I have all exchanged copies of our essays over email for final input and critique (using track changes).

During our meeting, and thereafter during essay exchange, Adam suggested I discuss more about CAFOs' effects on people that live near them. He suggested I highlight the government's role in perpetuating the CAFO paradigm. (I tried to add more detail on that in two sections of my paper.) He suggested I discuss more about the impacts of antibiotic resistance; I added another paragraph on MRSA ST 398 prevalence in swine CAFOs (a pernicious, and deadly, bacteria that

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defies most known antibiotics and kills > 18,000 people per year in this country). His comments were insightful and helped me plug some of the holes in my paper.

Hunter suggested I provide more detail on the entities impacted by CAFOs (neighbors, workers, etc.). He offered grammatical suggestions (gratefully accepted) and suggested I expound upon the Missouri study I reference on lowered property values (I did). He wondered if I should add a section discussing that cows die from eating grain and not grass – an interesting side topic. The perverse grain-fed diet does eventually kill ruminants (antibiotics help slow this effect). However, since I opted against addressing animal welfare in this paper I decided against adding it (Pandora's box).

Overall, though our cumulative effort was easier this time around, I still benefitted greatly from both Hunter's and Adam's feedback.

*One final note:* I asked both reviewers to look at my footnote numbering. On my computer, my footnotes appear as numbers (correct). But when they opened the document and sent it back, the footnotes appeared as roman numerals. This leads me to believe that when they received the document, they received roman numeral footnotes. I have checked all applicable settings and I'm at a loss for why this is happening. I can only speculate that it is a Mac versus Microsoft incompatibility issue. I strongly suspect you will also see roman numerals, despite the fact that the document in which I'm typing right now shows numbers ... Sigh. If you can open a .docx file, perhaps you can avoid this issue. I will attach one in the format just in case.