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American Meat: A Threat to Your Health and to the Environment

Polly Walker, M.D., M.P.H.* & Robert S. Lawrence, M.D.†

Slaughterhouse Blues: The Meat and Poultry Industry in North America. By Donald D. Stull and Michael J. Broadway. *Belmont, CA: Thomson/Wadsworth*, 2003. Pp. 172.

In 1923 Mrs. Cecile Steele of Delaware received 500 chicks instead of the fifty she had ordered to restock her flock of laying hens. When she decided to keep all 500 chicks and found she could turn a profit selling them as food, the era of "big chicken" was born on the eastern shore of Maryland.[1] In *Slaughterhouse Blues: The Meat and Poultry Industry in North America*,[2] anthropologist Donald Stull and social geographer Michael Broadway team up to investigate the impact of the unprecedented changes that followed in the poultry industry and similar changes that occurred in the beef and pork industries.

Slaughterhouse Blues is an important book and should be of interest to all who care about sustainable agriculture, the future of rural communities, and the health and environmental consequences of the current industrial agricultural system. The book is an excellent introduction to the important links between public health and food production. The authors frame the larger issue in the book's preface:

> Canada and the United States are urban societies and, despite our collective dependence upon agriculture, most North Americans have lost

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1. DONALD D. STULL & MICHAEL J. BROADWAY, SLAUGHTERHOUSE BLUES: THE MEAT AND POULTRY INDUSTRY IN NORTH AMERICA 38 (2003). "Big Hog" developed only in the latter part of the twentieth century, *id.* at 57-60, and "Big Beef" developed slowly from the late nineteenth century and through the twentieth century, *id.* at 27-35.

2. STULL & BROADWAY, *supra* note 1.

> any connection to their agrarian heritage. Yet, if we do not understand where our food comes from and how it gets to our table, who produces it and . . . at what cost, we stand to jeopardize the very food supply that sustains us. . . . [W]hat we eat has real consequences for workers, communities, and the environment.[3]

Stull and Broadway proceed to analyze the industrialization of meat and poultry production systems over the last 150 years along with the sociological consequences of these changes on workers and communities. While the authors' discussion of the industrialization of the meat and poultry industry is excellent, they fail to fully explore two important issues introduced in the opening chapter: 1) the fact that current per capita meat consumption in the United States exceeds nutritional needs and 2) the fact that industrial agriculture and animal production systems are unsustainable, inequitable, and injurious to public health and the environment. Despite this, *Slaughterhouse Blues* is an outstanding introduction to the social and environmental consequences of industrial meat and poultry production at the start of the twenty-first century—problems too long ignored by the public health community.

The book's first chapter, "Setting the Table," lays out the authors' central thesis. They contend that the industrialization of agriculture, specifically meat and poultry production, has resulted in a few very large producers, huge concentrated animal production facilities, the selection of animal breeds for quick growth, negative health and environmental consequences, and a changed rural America. By providing ostensibly cheap meat and poultry, this system has also contributed to increased per capita consumption of meat and poultry.[4]

Since most Americans have never visited a feedlot, a slaughterhouse, or a concentrated animal feeding operation (CAFO), the authors provide important, vivid descriptions both of the conditions inside these facilities and of the consequences of these conditions for workers and communities. The current food system produces inexpensive food, but at enormous costs that are passed on to workers, the public, and to future generations; these are the economic externalities of the current food production system. Increasingly, this scenario of concentrated animal production is being replicated in countries around the world, especially as U.S. environmental regulations become more stringent, U.S. communities organize to block construction of new factory farms in their neighborhoods, and more states adopt state-wide moratoriums against building additional CAFO facilities.

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3. *Id.* at xvi-xvii.
4. *Id.* at 19-20.

The development of animal production systems in the twentieth century has followed a model of increased efficiency, where corporate profit is maximized and there is very little regulation. The industry has not given adequate attention to worker safety, public health, and animal welfare concerns, despite the enormous impact that these systems may potentially have on the public's health. The health of workers is affected by air pollution, repetitive motion diseases, industrial accidents, and direct contact with ill or diseased animals.[5] Those living near the feeding lots and CAFO facilities may be exposed to air and water pollution and may suffer psychological stress associated with odors, noise pollution, and other factors.[6] The authors mention concerns for the public at large that include food poisoning and an increase in antibiotic resistant infections resulting from the widespread and inappropriate use of antibiotics in animal feed.[7]

In the early chapters of the book, the authors trace the history of beef, pork, and poultry production in the United States, giving colorful examples from history and their own first-hand experiences touring slaughterhouses and factory farms and interviewing slaughterhouse workers and factory farm contract growers. The authors also provide a thorough and interesting discussion of forces, such as the development of railroads and refrigeration, which have contributed to the geographical and corporate concentration of meat and poultry production into vertically integrated industries and the concomitant decline of family farms and independent operators.

In *Slaughterhouse Blues*, the authors document the increasing concentration and intensification seen in all three industries—beef, pork, and poultry. Only four companies now control eighty-one percent of the beef market, fifty-nine percent of the pork market, and fifty percent of poultry production.[8] Vertical integration began in the poultry industry in the 1960s. Corporate giants such as Tyson and Purdue now control all stages of chicken production, from breeding chickens, hatching chicks, and growing the chickens, to processing and shipping finished cuts of poultry to the supermarket. Increasingly, they are producing value-added,

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5. Richard Fenske & Nancy Simcox, *Agricultural Workers, in* OCCUPATIONAL HEALTH: RECOGNIZING AND PREVENTING WORK-RELATED DISEASE AND INJURY 729 (Barry S. Levy & David H. Wegman eds., 4th ed. 2000); NL Sprince et al., *Risk Factors for Agricultural Injury: A Case-Control Analysis of Iowa Farmers in the Agricultural Health Study*, 9 J. AGRIC. SAFETY & HEALTH 5 (2003).

6. Steve Wing et al., *Environmental Injustice in North Carolina's Hog Industry*, 108 ENVTL. HEALTH PERSPS. 3 (2000).

7. STULL & BROADWAY, *supra* note 1, at 20.

8. *Id.* at 158.

prepared cuts of poultry as well. This same pattern was adopted by the hog industry beginning in the 1980s in North Carolina—the number of hogs raised increased five-fold between 1982 and 1997, while the number of hog farms fell from over 11,000 to about 3000.[9] The authors show how this same pattern of hog production is now occurring elsewhere in the United States and in Canada and is being adopted by the beef and dairy industries as well.

The dramatic change from small farms raising a few hundred head of cattle, hogs, or chickens to the large, vertically integrated CAFOs and slaughterhouses of today has many consequences. In *Slaughterhouse Blues*, Stull and Broadway focus on the social changes rural communities experience as their family farmers are forced out of business and as towns are forced to cope with an influx of immigrants who work at the new plants. Ordinary people living in rural communities are not included in the decision to attract industrial animal producers to their doorsteps, in determining the location of the new CAFOs, or in reaping the tax breaks and other benefits of their presence. But while ordinary people are not included in these decisions, they suffer the consequences. As the authors note, "[A]s farm size increases, so does rural poverty."[10]

Communities must cope with the increased demand for services accompanying the rapid influx of migrant and low-wage earners, including demand for low-cost housing, social services, and more schools.[11] The authors point out that communities are often unprepared for these realities and lack the resources to deal with these problems when they do occur. By way of example, they cite the town of Brooks in Alberta, Canada. Based on their studies of other towns' experiences, the authors of *Slaughterhouse Blues* advised the town not to allow a beef processing plant to be constructed there, but the town's leaders rejected that advice. After the fact, those town leaders sadly admitted that the overall impact of the new plant was negative despite the promises of economic development, jobs, and prosperity that the corporation had made prior to the plant's construction.[12] The authors describe their frustration in trying to help communities deal with the social changes brought by these large meat packing facilities: "And while we nod knowingly as community members tell us our predictions came true, we are invariably humbled and disappointed by the rigidity of the industry and the inability of local

9. *Id.* at 58.
10. *Id.* at 149.
11. *Id.* at 122.
12. *Id.* at 124.

communities to do more than mitigate its social and economic costs."[13]

The authors' research focuses on the changes that take place in a community once a large meatpacking plant or CAFO is constructed. Knowledge about the social and economic consequences of industrial agriculture should aid local governments in making informed decisions for their communities and will also help community members hold governments accountable. An equally important area of research, given less attention in *Slaughterhouse Blues*, is documentation of the factors that make an area attractive for industrial animal production. These factors may include lack of environmental regulations, tax incentives by county or city government, infrastructure such as roads built at local government expense, available land, and the proximity of transportation, markets, and slaughterhouses. Further research to identify the specific factors that lead large companies to choose a particular region or community for a plant would explain much about the growth of industrial animal production.[14]

Another area where more research is needed is assessment of the full impact of the odor, noise, water pollution, air pollution, and transmission of antibiotic resistance on the physical and mental health of people living near CAFOs. Three studies have shown increased rates of both physical and mental illness among people living near CAFOs, but further investigation is required in order to understand the specific components of CAFO emissions that are contributing to the many reported illnesses.[15]

As the authors note, locating CAFOs or slaughterhouses in areas where the residents are predominantly poor and/or from minority groups raises concerns about environmental justice. *Slaughterhouse Blues* discusses the seminal work of Steve Wing and colleagues in North Carolina who have documented that CAFO facilities in North Carolina are sited disproportionately in poor, nonwhite communities that lack the political power to resist.[16] While the permitting process for siting CAFOs varies by state and county, and may include environmental considerations such as water use and manure management, health and justice concerns for communities are rarely included in the permitting process.

In chapter five, the authors mention, but do not elaborate on, the serious impact of large concentrations of animals on the environment, nearby residents, and the public at large. The current industrial food

13. *Id.* at 126.

14. *Id.* at 42.

15. Steve Wing & Susanne Wolf, *Intensive Livestock Operations: Health and Quality of Life Among Eastern North Carolina Residents*, 108 ENVTL. HEALTH PERSPS. 233 (2000).

16. Steve Wing et al., *supra* note 6; *see also* STULL & BROADWAY, *supra* note 1, at 59.

production system causes environmental effects that ultimately lead to public health problems and, therefore, warrant increased attention from public health professionals. Irreplaceable fossil aquifers are being drawn down for irrigation of feed crops; pesticides and fertilizers used to grow animal feed contaminate water and soil; and ocean fisheries are being depleted to produce feed for factory farmed poultry, pork, and fish.[17] Animal feed additives, such as antibiotics and heavy metals including arsenic, end up in manure that is spread on fields, and manure from lagoon spills, leaks, and excess land applications contaminate waterways.[18]

Stull and Broadway provide a good discussion of the astounding amount of manure produced by hog CAFOs. Since hogs produce up to four times as much solid waste as an average person, a CAFO of 5000 hogs is equivalent to a city of 20,000 with no sewage treatment plant. The total amount of animal manure produced annually in the United States is 12.4 billion tons. The authors discuss how difficult it is to safely store and dispose of all that waste. Hog waste "lagoons" are prone to having leaks and can overflow during storms, thereby polluting streams, rivers, and drinking water wells with massive amounts of raw manure.[19]

Cropland application of manure, the standard disposal practice, often saturates the land with more phosphorous and nitrogen than crops can utilize or the soil can retain. In addition, land application may not be as safe as the authors of *Slaughterhouse Blues* imply. Since the growers usually do not know what ingredients are included in the feed, they also do not know what is in the manure produced by the chickens or hogs. Manure may contain antibiotics, bacteria—such as Salmonella—that may be resistant to those same antibiotics, arsenic, and other additives.[20]

The use of antibiotics as "growth promoters" in feed has caused concern among many health organizations including the World Health Organization and the U.S. Centers for Disease Control and Prevention.[21]

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17. JOHN DAVENPORT ET AL., AQUACULTURE: THE ECOLOGICAL ISSUES 10-18 (2003).

18. Lars Jensen et al., *Antimicrobial Resistance Among* Pseudomonas ssp. *and the* Bacillus cereus *Group Isolated from Danish Agricultural Soil*, 26 ENV'T INT'L. 581 (2001); I. Krapac et al., *Impacts of Swine Manure Pits on Groundwater Quality*, 120 ENV'T POLLUTION 475 (2002).

19. Steve Wing et al., *The Potential Impact of Flooding on Confined Animal Feeding Operations in Eastern North Carolina*, 110 ENVTL. HEALTH PERSPS. 387 (2001).

20. NAT'L RESEARCH COUNCIL, BIOSOLIDS APPLIED TO LAND (2002), *available at* http://www.nap.edu/books/0309084865/html/ (last visited Jan. 18, 2004); D. Rutherford et al., *Environmental Fate of Roxarsone in Poultry Litter. Part II. Mobility of Arsenic in Soils Amended with Poultry Litter*, 37 ENVTL. SCI. & TECH. 1515 (2003).

21. Press Release, World Health Organization (WHO), Council and Parliament Prohibit Antibiotics as Growth Promoters (July 22, 2003), *at*

Over seventy percent of all antibiotics in the United States are used in animal production, including many identical to those used to treat humans. The emergence of resistant strains of bacteria in animals jeopardizes the future usefulness of these powerful agents against human disease.[22]

The effect of the industrial animal production system on the farmers who actually raise the animals is an important issue, but the authors discuss it only briefly. The authors do not address the nearly feudal system of contracts where "growers" commit to build chicken houses or swine confinement facilities to company specifications, and the company provides the chicks or piglets, their feed, and their medications. In a system where growers essentially become serfs on their own land, the company owns the chicks or piglets from start to finish and rewards those who produce in larger quantities and achieve a higher than average ratio of animal weight per feed input. However, the company does not own the manure or any dead or sick animals; instead, the growers remain responsible for disposing of these wastes. The margin of profit for the growers is extremely slim, and they often actually lose money but continue in the business because of huge debts incurred for building the chicken or swine facilities in the first place.[23]

Increased productivity is the stated goal of industrial animal production, but at what cost? The authors of *Slaughterhouse Blues* suggest that the costs of that increased productivity may be significant; they discuss the economic impact of CAFOs and disassembly plants in the chapter entitled, "There's No Such Thing as a Free Lunch." However, their analysis omits a full discussion of the externalized costs of industrial animal production and the inherent non-sustainability of the system. The root of the problem with industrial animal production is that the industry does not pay for the true costs of the system. Instead these costs are externalized—passed on to workers as low wages; imposed on communities as increased social services, over-crowded schools, and additional taxpayer-funded

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http://www.keepantibioticsworking.com/News/News.cfm?news_ID=349 (last visited Nov. 5, 2003); *Frequently Asked Questions About NARMS*, Centers for Disease Control and Prevention (CDC), *at* http://www.cdc.gov/narms/faq.htm (Dec. 29, 2003).

22. STULL & BROADWAY, *supra* note 1, at 151; MARGARET MELLON ET AL., HOGGING IT!: ESTIMATES OF ANTIMICROBIAL ABUSE IN LIVESTOCK 63 (2001).

23. The authors have engaged in personal communication with many animal farmers, and this information is on file with the authors. An insightful conference on this topic, entitled "The Chicken: Its Biological, Social, Cultural and Industrial History: From Neolithic Middens to McNuggets," was held at Yale University in New Haven, Connecticut in May 2002.

infrastructure; and left to the future as polluted waterways, depleted aquifers, toxic residues from agrichemicals used in feed production, depletion of non-renewable fossil fuels, and the diversion of crops suitable for human consumption to the inefficient conversion of grain into meat. These externalities are not included in the market prices. Chickens are now raised in half the time to twice the size they were in 1926 and cost the consumer a fraction of what they cost per pound in 1926 (ten dollars per pound in today's dollars), but they still yield a profit for the corporations.[24] Meanwhile, the short and long-term human and environmental costs are generally not acknowledged, understood, or addressed by consumers or policy makers; instead, they are absorbed by current and future generations. Profits are privatized while health risks and environmental costs are socialized.

Stull and Broadway paint a picture of an industry crying out for regulation. Upton Sinclair, by drawing attention to conditions in the slaughterhouses of the early twentieth century in *The Jungle*, stimulated passage of legislation such as the Federal Food and Drugs Act of 1906 (the "Wiley Act").[25] Sinclair's original intent was to stir empathy for the plight of workers, rather than to arouse concerns about the safety of food, although reform was needed in the latter area as well. Unions finally succeeded in improving wages and working conditions by mid-century, only to have conditions deteriorate as the meat industry increasingly recruited non-union workers from minority groups and immigrants who lacked the power or know-how to alleviate their condition. Today, unions are once again helping to change the food industry. For example, the United Food and Commercial Workers (UFCW) union won a settlement with Perdue Farms in which 25,000 poultry workers were awarded ten million dollars.[26]

Stull and Broadway point out that consumption of meat has increased, without addressing the important fact that current meat consumption in the United States far exceeds nutritional needs. However, they do contend that increased consumption of meat is the driving force of the whole system. In their first chapter, "Setting the Table," they lay out key United States Department of Agriculture (USDA) figures on average meat consumption in the United States to illustrate how it has changed during the last century. In the year 2000, the average American ate ninety-one

24. STULL & BROADWAY, *supra* note 1, at 38.

25. Pub. L. No. 59-384, 34 Stat. 768 (1906); *see* STULL & BROADWAY, *supra* note 1, at xiii.

26. *$10 Million Back Pay Award for Poultry Workers a Victory; But Too Many Employers Still Breaking Wage Laws*, LRA Online, *at* http://www.laborresearch.org/story2.php/197 (May 14, 2002).

pounds of chicken per year compared with fourteen pounds per year in 1926 and twenty-one pounds per year in 1930. Annual beef consumption doubled from 48.6 pounds per capita in 1930 to a high in 1970 of 113.7 pounds per capita

But do we need all that animal fat and protein? The authors refer to the obesity epidemic in the United States, and they discuss some of the changes in the American food industry, such as the prevalence of fast food and "supersizing," and other changes in the American lifestyle that may contribute to this epidemic.[27] This excess consumption of saturated fat, mostly from animal products such as meat and high fat dairy, deserves more attention as a health, equity, and environmental problem. Saturated fat consumption is a major contributor to the high prevalence of cardiovascular disease in developed countries, and an emerging problem among the affluent in developing countries as well.[28] Current meat consumption in the United States averages 220 pounds per person per year, supplying nearly double the amount of protein we need.[29]

In the section "Feed People, Not Cows!" the authors make the very important observation that producing poultry and meat is an inefficient way to produce calories and nutrients for the human diet.[30] Lester Brown of World Watch argues further that world food production capacity cannot produce enough grain to meet world food needs if more people adopt the high meat diet of the average person in the United States. The amount and type of meat in the diet determines the total amount of grain needed. The United States has the highest per capita grain consumption in the world at about 900 kilograms of grain per capita per year.[31] The more meat a person consumes, the more grain that person will indirectly consume per year since grain must be fed to cattle, pigs or poultry first. On average it takes seven kilograms of grain to produce one kilogram of beef, four

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27. STULL & BROADWAY, *supra* note 1, at 147-49.

28. THE NUTRITION TRANSITION: DIET AND DISEASE IN THE DEVELOPING WORLD 1-5 (Benjamin Caballero & Barry M. Popkin eds., 2002) [hereinafter THE NUTRITION TRANSITION].

29. The American Heart Association recommends no more than six ounces of cooked lean meat per day for protein needs or 136.9 pounds per year. *Eating Plan: Meat, Poultry and Fish*, American Heart Association, *at* http://www.americanheart.org/presenter.jhtml?identifier=1084 (last visited Jan. 18, 2004).

30. STULL & BROADWAY, *supra* note 1, at 18.

31. W. W. NORTON & CO., STATE OF THE WORLD, 1999: A WORLD INSTITUTE REPORT ON PROGRESS TOWARD A SUSTAINABLE SOCIETY 120 (1999). Italy and Taiwan are in the middle at 400 and 300 kilograms average per capita grain consumption respectively, and India is at 200 kilograms per capita. These figures are current as of 1990. *Id.*

kilograms of grain for one kilogram of pork, and two kilograms of grain to produce one kilogram of poultry. It is much more efficient for humans to ingest the grain protein directly.

The United States is exporting both the methods of industrial animal production and the retail outlets to fuel an increased appetite for meat—and in many countries laws governing occupational health and environmental protection are much weaker than they are here. More in-depth research is needed to document fully how the consolidation and concentration of animal production has impacted the environment, communities, and health. Solutions to these problems will likely include government regulation and enforcement, as well as better-informed consumer choices. Since both depend on an informed public, we concur with the authors' views in the closing statement of their last, "Food for Thought":

> Each of us chooses the food we eat, and our choices shape prevailing systems of production, processing, and packaging. The challenge for those concerned about developing a sustainable agricultural system, one that respects land, producers, harvesters, and processing workers is to show consumers the connection between the food they eat and the prevailing industrial production system. Only if we make that connection will more people demand changes in their food and how it is produced. It is to that end, that we offer this book.[32]

This volume is an important contribution to our understanding of the many connections between the food we eat and the industrial production system that creates that food. Anyone concerned about food security, environmental justice, and intergenerational equity with regard to use of the earth's non-renewable resources should read this book. We also hope *Slaughterhouse Blues* will stimulate much needed research to document more completely the adverse health effects of high rates of meat consumption and the adverse environmental and public health effects associated with the industrial animal production system that is needed to satisfy America's insatiable desire for large amounts of cheap meat.

32. STULL & BROADWAY, *supra* note 1, at 158.