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SB 841 – Water Pollution Control - Discharge Permits - Industrial Poultry Operations - SUPPORT TESTIMONY
Bill Sponsor: Senator Lam
Committee: Education, Health, and Environmental Affairs
Person Submitting: Sarah Goldman
Position: FAVORABLE

Disclaimer: The opinions expressed herein are our own and do not necessarily reflect the views of The Johns Hopkins University.

Dear Chair Pinsky, and members of the Education, Health, and Environmental Affairs Committee, thank you for the opportunity to submit this statement for the record in support of S.B. 841. We are researchers at the Johns Hopkins Center for a Livable Future, an interdisciplinary academic center focused on food systems and public health. The Center is in the Bloomberg School of Public Health's Department of Environmental Health and Engineering. We have been researching Industrial Food Animal Production since our Center's founding in 1996. Recognizing the negative public health implications that results from industrial food animal production, we support S.B. 841.

Confined Animal Feeding Operations (CAFOs) are harmful to human and environmental health. Due to the negative impacts associated with CAFOs, the Center for Disease Control determined that these operations pose risks to public health and the environment.[1] The American Public Health Association also released a policy statement calling for a precautionary moratorium on new and expanding CAFOs based on these operations' negative public health impacts.[2]

CAFOs contribute to negative human health outcomes via environmental degradation
Raising animals in large, high-density operations leads to the routine accumulation of large volumes of animal waste, often at rates far exceeding the capacity of nearby farmland to absorb it. The excess waste produced is often disposed of in a manner that can pollute surface and

[1] Centers for Disease Control and Prevention. Animal feeding operations. Available at: https://www.cdc.gov. Accessed November 28, 2019.
[2] American Public Health Association. Precautionary Moratorium on New and Expanding Confined Animal Feeding Operations. Available at: https://www.apha.org/policies-and-advocacy/public-health-policy-statements/.

groundwater resources, posing public health and ecological hazards. CAFO-generated manure has constituents and byproducts of health concern, including antibiotics, pathogens, bacteria, nitrogen, and phosphorus.[3] Manure from these operations can contaminate ground and surface waters with nitrates, drug residues, and other hazards,[4] and studies have demonstrated that humans can be exposed to waterborne contaminants from poultry operations through the recreational use of contaminated surface water and the ingestion of contaminated drinking water.[5],[6] This is of particular concern for the 34.2 million Americans, approximately 11% of the population, who rely on private wells for drinking water and household use,[7],[8] as private wells are not monitored by government agencies to ensure safe levels of pathogens.[9] Furthermore, land application of manure in excess of the land's absorptive capacity can lead to excess nitrogen and phosphorus in soil, water resource pollution, eutrophication of surface waters, and algae overgrowth, including some algae producing human toxins.[10] Exposure to elevated levels of nitrates in drinking water is associated with adverse health effects such as cancer, birth defects and other reproductive problems, thyroid problems, and methemoglobinemia (blue baby syndrome).[11] In addition, exposure to algal toxins has been linked to adverse health effects including gastrointestinal illness, liver inflammation and failure, severe dermatitis, respiratory paralysis, cardiac arrhythmia, and tumor promotion.[12]

<u>CAFOs pose additional risks to workers and surrounding communities</u>

CAFOs pose a particular risk for workers. One Pennsylvania study showed that living in close proximity to poultry operations may increase the risk of community-acquired pneumonia.[13] In addition, CAFO workers can be exposed to airborne waste particles, drug residues, heavy metals, and potentially harmful pathogens, many of which can be transferred into neighboring

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[3] Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality. Washington, DC: Environmental Protection Agency; 2013.
[4] Ibid.
[5] Environmental Protection Agency. Relation between nitrates in water wells and potential sources in the Lower Yakima Valley, Washington State. Available at: https://cfpub.epa.gov. Accessed November 28, 2019.
[6] Burkholder J, Libra B, Weyer P, et al. Impacts of waste from concentrated animal feeding operations on water quality. Environ Health Perspect. 2007;115:308–312.
[7] Centers for Disease Control and Prevention. Ground Water Awareness Week. Available at: https://www.cdc.gov. Accessed November 28, 2019.
[8] U.S. Census Bureau. U.S. and world population clock. Available at: https://www.census.gov. Accessed November 28, 2019.
[9] Environmental Protection Agency. Private drinking water wells. Available at: https://www.epa.gov. Accessed November 28, 2019.
[10] Ibid.
[11] Ward MH. Too much of a good thing? Nitrate from nitrogen fertilizers and cancer. Rev Environ Health. 2009;24:357–363.
[12] Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality. Washington, DC: Environmental Protection Agency; 2013.
[13] Poulsen MN, Pollak J, Sills DL, et al. High-density poultry operations and community-acquired pneumonia in Pennsylvania. Environ Epidemiol. 2018;2:e013.

communities by these workers.[14],[15] People living near CAFOs may also have an increased risk of infection owing to the transmission of harmful microbes from CAFOs via flies or contaminated water and air.[16]

CAFOs perpetuate environmental injustice

Research has also revealed that CAFOs have disproportionate negative health impacts for low-income, disadvantaged, and economically distressed communities, as well as communities of color.[17],[18],[19] The establishment of CAFOs in a community is frequently associated with declines in local economic and social indicators (e.g., business purchases, infrastructure, property values, population, social cohesion), which undermine the socioeconomic and social foundations of community health.[20] Moreover, the negative health and environmental impacts associated with CAFOs can become concentrated in these communities due to their limited economic and political resources to address problems.

CAFOs contribute to antibiotic resistance

Administering antibiotics to animals at levels too low to treat disease fosters the proliferation of antibiotic-resistant pathogens.[21] While many CAFOs utilize antibiotics prophylactically, there is scientific consensus that antibiotics administered to food animals contribute to antibiotic resistance in humans.[22],[23] Studies have demonstrated that antibiotic-resistant pathogens are found in animal operations that administer antibiotics for purposes other than treating or controlling veterinarian-diagnosed disease and are also found in the environment in and around production facilities.[24] Pathogens can spread from animal production operations to surrounding communities, exposing workers, their family members, and community members to these

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[14] Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality. Washington, DC: Environmental Protection Agency; 2013.

[15] Graham JP, Leibler JH, Price LB, et al. The animal-human interface and infectious disease in industrial food animal production: rethinking biosecurity and biocontainment. Public Health Rep. 2008;123:282–299.

[16] Ibid.

[17] Donham KJ, Wing S, Osterberg D, et al. Community health and socioeconomic issues surrounding concentrated animal feeding operations. Environ Health Perspect. 2007;115:317–320.

[18] Nicole W. CAFOs and environmental justice: the case of North Carolina. Environ Health Perspect. 2013;121:a182–a189.

[19] Abara W, Wilson SM, Burwell K. Environmental justice and infectious disease: gaps, issues, and research needs. Environ Justice. 2012;5:8–20.

[20] Donham KJ, Wing S, Osterberg D, et al. Community health and socioeconomic issues surrounding concentrated animal feeding operations. Environ Health Perspect. 2007;115:317–320.

[21] Pew Commission on Industrial Farm Animal Production. Putting meat on the table: industrial farm animal production in America. Available at: https://www.pewtrusts.org. Accessed November 28, 2019.

[22] Ibid.

[23] Hribar C. Understanding concentrated animal feeding operations and their impact on communities. Available at: https://www.cdc.gov. Accessed November 28, 2019.

[24] Graham JP, Price LB, Evans SL, Graczyk TK, Silbergeld EK. Antibiotic resistant enterococci and staphylococci isolated from flies collected near confined poultry feeding operations. Sci Total Environ. 2009;407:2701–2710.

resistant pathogens.[25] In addition, numerous studies have shown that industrial food animal production workers and their family members, as well as those who are in residential proximity to CAFOs, face increased risk of antibiotic-resistant infections. Resistant infections in humans are more difficult and expensive to treat[26] and more often fatal[27] than infections with non-resistant strains.

S.B. 841 is an important step towards reducing the negative public health implication of CAFOs. We applaud the committee for considering this bill.

Sincerely,

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[25] Casey JA, Kim BF, Larsen J, Price LB, Nachman KE. Industrial food animal production and community health. Curr Environ Health Rep. 2015;2:259–271.
[26] Aryee A, Price N. Antimicrobial stewardship—can we afford to do without it? Br J Clin Pharmacol. 2014;79:173–181.
[27] Filice GA, Nyman JA, Lexau C, et al. Excess costs and utilization associated with methicillin resistance for patients with Staphylococcus aureus infection. Infect Control Hosp Epidemiol. 2010;31:365–373.

Asthma (and Respiratory Disease) & Poultry Production
Annotated Bibliography

United States:

Ngajilo, D., Singh, T., Ratshikhopha, E., Dayal, P., Matuka, O., Baatjies, R., & Jeebhay, M. F. (2018). Risk factors associated with allergic sensitization and asthma phenotypes among poultry farm workers. American Journal of Industrial Medicine, 61(6), 515–523. doi: 10.1002/ajim.22841

The Study: This study investigated the risk factors for occupational allergic sensitization and various asthma phenotypes in poultry‐workers.

Results: **The findings of this study are consistent with other studies that show poultry workers are at increased risk of allergic sensitization and asthma** with non‐atopic asthma being the most prevalent asthma phenotype in this group of workers. **Moreover, sensitization to poultry work-related allergens develops early during employment (within the first 2 years).**

Loftus, C., Yost, M., Sampson, P., Torres, E., Arias, G., Breckwich Vasquez, V., Hartin, K., Armstrong, J., Tchong-French, M., Vedal, S., Bhatti, P., & Karr, C. (2015). Ambient Ammonia Exposures in an Agricultural Community and Pediatric Asthma Morbidity. *Epidemiology (Cambridge, Mass.)*, *26*(6), 794–801. https://doi.org/10.1097/EDE.0000000000000368

The Study: Describes spatial and temporal patterns in ambient ammonia concentrations in an agricultural region (Yakima Valley, Washington State), and investigates associations between short-term fluctuations in ammonia and subsequent changes in respiratory health in children with asthma.

Results: **Ammonia concentrations were elevated in this community and strongly predicted by proximity to animal feeding operations**. **Exposure to airborne ammonia from animal feeding operations may exacerbate pediatric asthma in surrounding communities.**

Donham KJ, Cumro D, Reynolds SJ, Merchant JA. Dose-response relationships between occupational aerosol exposures and cross-shift declines of lung function in poultry workers: recommendations for exposure limits. J Occup Environ Med 42(3):260-269, 2000.

The Study: This study reports new results from a previously reported in-depth multiphase study of occupational exposures and health risks in the poultry industry.

The research described here is an expansion of the previous study and focuses on dose-response relationships and threshold environmental concentrations. A total of 257 poultry workers (30% women, 70% men) were recruited from the complete Iowa membership rosters of the relevant producer organizations, including 124 turkey growers/loaders and 92 egg producers.

Results: This is the **first study of poultry confinement workers to exhibit dose-response trends between increasing environmental dust, ammonia, and endotoxin concentrations with corresponding cross-shift declines in worker lung function**. **In summary, relationships observed between ambient environmental exposures and acute changes in lung function for persons occupationally exposed to live poultry include significant dose-response relationships between total and respirable dust, total and respirable endotoxin, and ammonia, and cross-shift declines in FEV_1 and $FEF_{25–75}$.**

Note: FEV1 is the amount of air you can force from your lungs in one second. It's measured during a spirometry test, also known as a pulmonary function test, which involves forcefully breathing out into a mouthpiece connected to a spirometer machine.

Note: $FEF_{25–75}$ is the forced expiratory flow averaged over the middle portion of FVC, and is hypothesized to be a marker for peripheral airways obstruction.

Morris, P. D., Lenhart, S. W., & Service, W. S. (1991). Respiratory symptoms and pulmonary function in chicken catchers in poultry confinement units. American Journal of Industrial Medicine, 19(2), 195–204. doi: 10.1002/ajim.4700190207

The Study: Evaluates the respiratory consequences of working in poultry confinement units through a cross-sectional epidemiologic study of respiratory symptoms and pulmonary function in 59 chicken catchers. The results were compared to a published reference standard of nonexposed blue-collar workers.

The Results: **Chicken catchers reported a high rate of acute respiratory symptoms associated with work in poultry houses.** They also reported statistically significant higher rates for chronic phlegm (39.0%) and chronic wheezing (27.1%) than non-exposed blue-collar workers. Chicken catchers had significant decrements over a work shift in forced vital capacity (-2.2%) and forced expiratory volume in 1 sec (-3.4%), and there was suggestive evidence that they had decreased pre-shift pulmonary function compared with non-exposed blue-collar workers. **These results indicate that chicken catchers are at risk for respiratory dysfunction** and emphasize the need to develop measures to minimize their exposure to respiratory toxicants in poultry confinement units.

International:

Viegas, S., Faisca, V. M., Dias, H., Clerigo, A., Carolino, E., & Viegas, C. (2013). Occupational exposure to poultry dust and effects on the respiratory system in workers. J Toxicol Environ Health A. , 76(4), 230–239. Doi:10.1080/15287394.2013.757199

The Study: The aim of this study was to determine PM contamination in seven poultry farms located in Lisbon district, Portugal. In addition, it was of interest to examine prevalence rate of pulmonary disorders in workers and the presence of clinical symptoms associated with asthma and other allergy diseases using a questionnaire formulated by European Community Respiratory Health Survey.

Results: Prevalence rate of obstructive pulmonary disorders was higher in individuals with longer exposure to poultry dust regardless of smoking status. In addition, a high prevalence for asthmatic (42.5%) and nasal (51.1%) symptoms was noted in poultry workers. **Data thus show that poultry farm workers are more prone to suffer from respiratory ailments. This may be attributed to higher concentrations of Particulate Matter found in the dust.**

Note: Dust is one of the components present in poultry production that originates from poultry residues, molds, and feathers and is biologically active as it contains microorganisms. Exposure to dust is known to produce a variety of clinical responses, including asthma, chronic bronchitis, chronic airways obstructive disease (COPD), allergic alveolitis, and organic dust toxic syndrome (ODTS).

Rimac, D., Macan, J., Varnai, V.M. et al. Exposure to poultry dust and health effects in poultry workers: impact of mould and mite allergens. Int Arch Occup Environ Health 83, 9–19 (2010). https://doi.org/10.1007/s00420-009-0487-5

The Study: The aim of the study was to evaluate exposure to molds and house dust mite Dermatophagoides pteronyssinus in poultry farms, and related health effects in poultry workers (PW). The study involved 41 poultry workers and 45 control office workers.

The Results: **In comparison to control subjects, significantly higher prevalence of work-related nose, asthma, eye and skin symptoms, and slight decline in ventilatory lung function was found in Poultry Workers.**

Borghetti C1, Magarolas R, Badorrey I, Radon K, Morera J, Monsó E. Sensitization and occupational asthma in poultry workers. Medicina Clinica, 28

Feb 2002, 118(7):251-255 Language:spa DOI: 10.1016/s0025-7753(02)72352-x PMID: 11882277

The Study: A high prevalence of asthma has been reported in poultry farmers. The aim of this study was to determine air contaminants in poultry confinement buildings and the prevalence of occupational asthma in these workers.

Results: **1/3 of poultry farmers working inside the studied poultry confinement buildings reported wheezing. The wheezing was partly attributable to occupational asthma caused by storage mites.**

Zuskin, E., Mustajbegovic, J., Schachter, E., Kern, J., Rienzi, N., Goswami, S., Maayani, S. (1995). Respiratory Function in Poultry Workers and Pharmacologic Characterization of Poultry Dust Extract. Environmental Research, 70(1), 11–19. doi: 10.1006/enrs.1995.1040

The Study: A group of 343 workers (252 males and 91 females) employed in four poultry farms in Croatia was studied for the prevalence of acute and chronic respiratory symptoms and lung function changes.

Results: **There were significantly higher prevalence of chronic cough, chronic phlegm, chronic bronchitis, and chest tightness in poultry workers than in control workers.** There was also a high prevalence of acute symptoms in poultry workers which developed during the work shift. The measured FVC, FEV1, and FEF25 in poultry workers were significantly lower than predicted normal values. Workers exposed for more than 10 years had lower ventilatory capacity tests (expressed as percentage of predicted) than those workers with shorter exposures. **This suggests that work in poultry farms may, for some workers, cause the development of acute and chronic respiratory symptoms and lung function changes.**

Quick Guide to Poultry Dust. (n.d.). Retrieved March 10, 2020, from https://www.hse.gov.uk/agriculture/poultry/guide.htm

Information on Poultry Dust: Poultry dust is a mixture of bird feed, bedding material (eg wood shavings/shreds or straw), bird droppings, feathers and dander (dead skin), dust mites and storage mites, and micro-organisms such as bacteria, fungi (molds) and endotoxins (cell wall components of bacteria). Poultry dust contains a complex mix of toxins and allergens

Respiratory Disease: Respiratory disease (a disease affecting our lungs and breathing tubes) is a major occupational health risk for people working in agriculture. The number of occupational asthma cases is double the national average**. Studies have shown that poultry workers' exposure to poultry dust can be substantial.**

Workers with occupational respiratory disease may develop permanent breathing problems, becoming disabled, and unable to work. This not only affects individual workers but has wider cost implications for employers and the poultry industry as a whole.

Respiratory Disease that Becomes Asthma: **Some occupational respiratory diseases affect the tubes that carry air in and out of the lungs (airways). Occupational asthma is an example of this sort of problem.**

Precautionary Moratorium on New and Expanding Concentrated Animal Feeding Operations

Date: Nov 05 2019 | **Policy Number:** 20194
Key Words: Environment, Environmental Health, Agriculture

Abstract

Over the last six decades, food animal production in the United States has transformed from a system of small and medium-sized farms toward one characterized by much larger operations that concentrate large numbers of animals and their manure in relatively small geographic areas. These operations function with the high throughput and rapid turnover of an industrialized system and are often referred to as concentrated animal feeding operations (CAFOs). The enormous accumulation of manure and other untreated waste created by CAFOs is often stored and disposed of in a manner that pollutes the air, surface, and groundwater, posing risks to the environment and human health, particularly for CAFO workers and nearby residents. These operations also disproportionately affect low-income, disadvantaged communities with high proportions of racial and ethnic minority residents, raising serious social and environmental justice concerns. The current industrial system of food animal production has externalized the costs of environmental degradation and adverse health impacts, keeping retail meat prices artificially low while shifting health and environmental costs onto communities and individual Americans. Moreover, these negative, externalized costs are likely to mount in coming years. Despite the growing evidence that CAFOs pose health and environmental risks and negatively impact workers and communities, CAFO regulations and their enforcement have failed to adequately protect human health and the environment. This policy statement calls for a moratorium on the establishment of new CAFOs and expansion of existing CAFOs until regulation and enforcement conditions are in place to adequately protect the public's health.

Relationship to Existing APHA Policy Statements

- APHA Policy Statement 201713: Establishing Environmental Public Health Systems for Children at Risk or with Environmental Exposures in Schools
- APHA Policy Statement 201712: Advancing a 'One Health' Approach to Promote Health at the Human-Animal-Environment Interface
- APHA Policy Statement 201711: Public Health Opportunities to Address the Health Effects of Air Pollution
- APHA Policy Statement 20177: Improving Working Conditions for U.S. Farmworkers and Food Production Workers
- APHA Policy Statement 201511: Impact of Preemptive Laws on Public Health
- APHA Policy Statement 201210: Promoting Health Impact Assessment to Achieve Health in All Policies
- APHA Policy Statement 20126: Anticipating and Addressing Sources of Pollution to Preserve Coastal Watersheds, Coastal Waters, and Human Health
- APHA Policy Statement 201110: Ending Agricultural Exceptionalism: Strengthening Worker Protection in Agriculture Through Regulation, Enforcement, Training, and Improved Worksite Health and Safety
- APHA Policy Statement 20098: Opposition to the Use of Hormone Growth Promoters in Beef and Dairy Cattle Production
- APHA Policy Statement 200712: Toward a Healthy Sustainable Food System
- APHA Policy Statement 200413: Helping Preserve Antibiotic Effectiveness by Demanding Meats Produced Without Excessive Antibiotics

- APHA Policy Statement 20037: Precautionary Moratorium on New Concentrated Animal Feed Operations

- APHA Policy Statement 200112: Discontinuing the Use of Fluoroquinolone Antibiotics in Agriculture

Problem Statement

Over the last several decades, food animal production in the United States has shifted from an extensive system of small and medium-sized farms to one characterized primarily by large-scale industrial operations that concentrate large numbers of animals in small geographic areas.[1] These operations function with high throughput and rapid turnover fueled by specially formulated animal feeds, pharmaceutical inputs, mechanization of production, and highly specialized animal breeds. This production model is known as industrial food animal production (IFAP).[2] The Centers for Disease Control and Prevention has determined that these operations pose risks to public health and the environment.[3]

In addition, food animal production has become a vertically integrated system, particularly in the swine and poultry industries.[2] In this model, a processing company, known as an integrator, owns and controls all stages of the production process, from the animals to the feed to the slaughterhouses. The farmer, or grower, contracts with the integrator to raise the animals and is responsible for capital investments of equipment and facilities, as well as the management and disposal of animal waste. Growers often have little market power and little to no autonomy over their farming operations.[1] Accompanying the trends of vertical integration and concentration of animals is the consolidation of the livestock and poultry industries, with operations becoming larger in size and fewer in number than in years past.[4] For example, over the last five decades, the average number of hogs per farm has increased from 37 to 1,044, while the number of hog farms has decreased from 1.85 million to 63,000.[5]

IFAP facilities, depending on their size and production methods, may be considered animal feeding operations or concentrated animal feeding operations (CAFOs) by the Environmental Protection Agency (EPA). The EPA defines animal feeding operations as facilities where "animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility."[6] To be considered a large CAFO, the facility must house at least 1,000 beef cattle, 700 dairy cows, 2,500 hogs, 125,000 broiler hens, or 82,000 laying hens,[7] although the average size of these facilities is much greater. One report revealed, for example, that the average cattle feedlot held 4,300 animals, and in some states the average poultry operation exceeded 500,000 birds.[8] CAFOs smaller than those designated as large by the EPA are regulated in the same way if they are determined by permitting authorities to be significant contributors of pollutants.[7] While the EPA has precise definitions for CAFOs, the term CAFO in this statement refers to operations that employ the IFAP methods and practices just described.

Raising animals in large, high-density operations leads to the routine accumulation of large volumes of animal waste, often at rates far exceeding the capacity of nearby farmland to absorb it.[9] As a result, these operations represent a significant public health and ecological hazard because the excess waste they produce is disposed of in a manner that can pollute surface and groundwater resources.[9] In the United States, CAFOs produce an estimated 369 million tons of animal manure a year, approximately 13 times the sewage produced by the U.S. population.[8] This animal waste is typically stored in open or covered pits or liquid lagoons and later spread or sprayed untreated on nearby cropland, posing additional risks to public health.[1] Workers in animal production can be exposed to airborne waste particles, drug residues, heavy metals, potentially harmful pathogens, and antibiotic-resistant bacteria, many of which can be transferred into neighboring communities by these workers.[9,10] In addition, people living near CAFOs may have an increased risk of infection owing to the transmission of harmful microbes from CAFOs via flies or contaminated water and air.[10]

Close proximity to CAFOs is frequently associated with declines in local economic and social indicators (e.g., business purchases, infrastructure, property values, population, social cohesion), which undermine the socioeconomic and social foundations of community health,[11] often in poor and African American rural communities.[12] There are disproportionate negative health impacts associated with CAFOs on low-income, disadvantaged, and economically distressed communities, as well as communities that are heavily dependent on groundwater and have high proportions of ethnic and racial minority residents, raising serious environmental justice concerns.[11–13] In addition, studies have shown that CAFOs are clustered in areas near low-income and non-White schools.[14,15] Also, low wages, lack of healthy food options, and poor access to medical care may intensify

the burden of disease in these communities.[13] Moreover, the negative health and environmental impacts associated with CAFOs can become concentrated in these communities due to their limited economic and political resources to address problems.[13]

In addition, while CAFOs produce large quantities of meat and other animal-source foods such as milk, eggs, cheese, and yogurt, their relatively low retail costs obscure the upstream, higher costs of industrial production. Externalized impacts, including environmental degradation and negative health effects associated with CAFOs as well as taxpayer subsidies, cost the American public billions of dollars annually.[16,17] Some of these externalized impacts include lower property values in communities located near CAFOs, costs associated with treating antibiotic-resistant disease, and costs associated with the cleanup and prevention of air and water pollution.[16] Externalized costs of CAFOs also include those associated with climate change.[17] Livestock production is the largest source of food system–related greenhouse gas emissions, accounting for an estimated 14.5% of such emissions worldwide.[18] Studies have also shown that meat and dairy from ruminant animals are particularly emissions intensive.[19]

Although animal manure is an invaluable fertilizer, waste quantities of the magnitude produced by CAFOs represent a public health and ecological hazard through the degradation of surface and groundwater resources.[9] CAFO-generated manure has constituents and byproducts of health concern, including antibiotics, pathogens, bacteria, hormones, nitrogen, and phosphorus.[9] Manure from these operations can contaminate ground and surface waters with nitrates, drug residues, and other hazards,[9] and studies have demonstrated that humans can be exposed to waterborne contaminants from livestock and poultry operations through the recreational use of contaminated surface water and the ingestion of contaminated drinking water.[20,21] This is of particular concern for the 34.2 million Americans, approximately 11% of the population, who rely on private wells for drinking water and household use,[22,23] as private wells are not monitored by government agencies to ensure safe levels of pathogens.[24] Manure storage systems, such as liquid lagoons or cess pits, are also vulnerable to breaches during heavy rainfall and flooding events, increasing the risk of environmental contamination.[21] This is particularly concerning given that extreme weather events are predicted to increase in frequency and severity over the coming decades.[25]

Pathogens in manure that are capable of causing severe gastrointestinal disease, complications, and sometimes death in humans include Campylobacter and Salmonella species, as well as Listeria monocytogenes, Yersinia enterocolitica, fecal coliforms such as Escherichia coli, and the protozoa Cryptosporidium parvum and Giardia lamblia.[9] Studies have linked human disease outbreaks involving these pathogens to livestock waste.[26,27] Of additional concern is exposure to pathogens that are resistant to antibiotics used in human medicine. Administering antibiotics to animals at levels too low to treat disease fosters the proliferation of antibiotic-resistant pathogens.[2] There is scientific consensus that antibiotics administered to food animals contribute to antibiotic resistance in humans.[1,2] More than 12 million pounds of antibiotics important to human medicine are sold annually for use in food animal production in the United States.[28] This represents 64% of all sales of these precious drugs, including for use in treating people.[29] U.S. food animal production uses these antibiotics at nearly twice the intensity (measured as milligrams of antibiotic active ingredient per kilogram of meat produced) as the collective livestock industries in 30 European countries.[30,31] In the United States, these antibiotics are used to treat or control disease and to prevent disease in animals without any clinically diagnosed disease to compensate for the overcrowded, poor environmental conditions characteristic of industrial animal agriculture.[2,32] Current APHA policy statements (201712, 20098, and 200712) register appropriate concern about agricultural use of medically important antibiotics.[33–35]

Studies have demonstrated that antibiotic-resistant pathogens are found in animal operations that administer antibiotics for purposes other than treating or controlling veterinarian-diagnosed disease[36] and are also found in the environment in and around production facilities.[37–40] Pathogens can spread from animal production operations to surrounding communities, exposing workers, their family members, and community members to these resistant pathogens.[41,42] In addition, numerous studies have shown that industrial food animal production workers and their family members, as well as those who are in residential proximity to CAFOs, face increased risk of antibiotic-resistant infections. A North Carolina study of industrial hog operation workers revealed that workers with nasal carriage of multidrug-resistant Staphylococcus aureus and livestock-associated Staphylococcus aureus were 8.8 and 5.1 times more likely to report recent skin and soft tissue infections than non-carriers, respectively.[43] Additional studies have shown that residential proximity to CAFOs is associated with increased risks of antibiotic-resistant infection[44] and colonization.[45] Resistant infections in humans are more difficult and expensive to treat[46] and more often fatal[47] than infections with non-resistant strains.

Furthermore, land application of manure in excess of the land's absorptive capacity can lead to excess nitrogen and phosphorus in soil, water resource pollution, eutrophication of surface waters, and algae overgrowth, including some algae producing human toxins.[9]

Exposure to elevated levels of nitrates in drinking water is associated with adverse health effects such as cancer, birth defects and other reproductive problems, thyroid problems, and methemoglobinemia (blue baby syndrome).[48] In addition, exposure to algal toxins has been linked to adverse health effects including gastrointestinal illness, liver inflammation and failure, severe dermatitis, respiratory paralysis, cardiac arrhythmia, and tumor promotion.[9]

Workers and community members living near CAFO operations also face increased exposure to air pollution from these operations, which can cause or exacerbate respiratory conditions including asthma,[49] eye irritation, difficulty breathing, wheezing, sore throat, chest tightness, nausea,[50] bronchitis, and allergic reactions.[49] Toxic air emissions include particulates, volatile organic compounds, and gases such as hydrogen sulfide and ammonia.[51] One Pennsylvania study showed that living in close proximity to poultry operations may increase the risk of community-acquired pneumonia,[52] and another study in that state revealed an association between proximity to industrial animal agriculture operations and clinically documented asthma exacerbations.[53] Odors associated with air pollutants from large-scale hog operations have been shown to interfere with daily activities, quality of life, social gatherings, and community cohesion[11] and to contribute to stress and acute increased blood pressure.[54] It is important to note that many of these risks are borne disproportionately by low-income, minority communities where, research has shown, CAFOs are often clustered.[14,15,55]

Evidence-Based Strategies to Address the Problem

While some federal, state, and local CAFO regulations exist, they are not sufficiently enforced and contain loopholes and deficiencies that limit their capacity to protect human and environmental health.[2] Many CAFOs are exempted from regulation, and monitoring and inspection are insufficient.[2] For example, CAFOs are exempt from hazardous air emissions reporting requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the EPA does not require reporting of air emissions from animal agriculture under the Emergency Planning and Community Right-to-Know Act (EPCRA).[56] Thus, the public is ill informed about the categories and quantities of hazardous substances released by CAFOs. In addition, as outlined in APHA Policy Statement 201511, preemption laws related to animal agriculture can prevent local governments from enacting ordinances to protect environmental and public health from CAFO air and water pollution.[57] This means local residents have little authority over the governance of CAFOs once they have been established in an area. Finally, the Safe Drinking Water Act does not apply to private wells, the EPA does not regulate private groundwater wells, and the Clean Water Act applies only to navigable, or surface, waters.[58–60] In light of these exemptions and loopholes, some states have proposed, and one has passed, CAFO moratoria in order to protect public health and the environment.[61,62]

Existing regulations must be strengthened, enforced, and applied to all CAFOs, as described below in the action steps, in order to adequately protect human and environmental health. Until such a time that this occurs, a moratorium on new and expanding CAFOs should be established.

Opposing Arguments

Without accounting for externalized costs, it can be argued that greater economies of scale can be achieved when raising large numbers of animals in CAFOs due to higher efficiencies and lower costs per unit.[2] A number of factors, including efficient animal feeding and housing, specialization of animals for food production, and large facility sizes, allow CAFOs to supply large quantities of animal-sourced foods such as milk, eggs, and meat.[1] CAFO technologies and practices that have reduced operating costs can mean bigger profits on less land and capital, and livestock systems have a global asset value of at least $1.4 trillion, providing food for individuals throughout the world.[1,63] In addition, animal manure, when applied appropriately, can be an effective, low-cost fertilizer for crops.[9] When CAFOs are being considered in particular areas, it is often argued that they can benefit the local economy by increasing demand for local materials and feed and can stimulate an increase in employment.[1] It is also argued that increased tax expenditures related to CAFOs will translate into greater funding for schools and infrastructure.[1]

As discussed earlier, however, the apparently low retail price tag for grocery items produced in CAFOs is due in large part to the substantial health and environmental costs of this production that have been “externalized” or deliberately ignored by this system. Rather than being the responsibility of CAFO operators, billions of dollars of these health and environmental costs have been paid by the American public each year.[16,17] In addition, the vertically integrated model characteristic of CAFOs has been found to contribute less to local economies than locally owned and controlled farms.[2] CAFO integrators are often not rooted in the local farming community, and thus profits from CAFO businesses leave the community.[2] In the United States (where the proposed moratorium would take effect), meat is consumed at more than three times the global average, which enhances the risk of chronic illness and has major negative consequences with respect to land use, water use,

and environmental change.[64] Also, as CAFOs are established and expanded in communities, the operations often rely more on technology than on additional labor to function, and as a result fewer jobs are available to local people.[2] In addition, the jobs that are available are often low paid and itinerant and filled by migrant laborers willing to work for low wages.[2] Furthermore, the potential for economic benefits should not be prioritized at the expense of human and environmental health. As described in the problem statement, wide-ranging human and environmental health impacts such as air and water pollution, environmental degradation, increased risk of exposure to pathogens, and increased risk of antibiotic resistance result from CAFO establishment and expansion.

Action Steps

In light of the wide-ranging negative health and environmental impacts associated with CAFOs, as well as serious environmental justice concerns, APHA urges federal, state, and local governments and public health agencies to impose a moratorium on new and expanding CAFOs until additional scientific data on the attendant risks to public health have been collected, uncertainties have been resolved, and the following action steps have been taken:

1. The federal government brings the use of medically important antibiotics in U.S. poultry and livestock production into compliance with the 2017 recommendation of the World Health Organization that producers stop using these precious antibiotics in healthy animals.[65] Federal regulators should end approval of such drug use in food-producing animals for the prevention of infectious diseases where disease has not been clinically diagnosed. This approval practice is currently allowed and is deemed "therapeutic" by the Food and Drug Administration.

2. The federal government removes CAFO exemptions from reporting of environmental emissions of hazardous materials under CERCLA and EPCRA reporting requirements.

3. The federal government enforces the Clean Water Act as it pertains to CAFOs.

4. The federal government strengthens CAFO regulations under the Clean Air Act by developing mechanisms to better monitor air emissions and collecting air emissions data to improve understanding of community exposure risks.

5. The federal government and state governments prohibit the installation of new liquid manure handling systems, including waste lagoons, and phase out their use in existing operations to reduce the risk of public health and environmental disasters.

6. The federal government government and state governments, in coordination with the National Pollutant Discharge Elimination System and Natural Resources Conservation Service Comprehensive Nutrient Management Plans, develop and implement strict oversight protocols for the application of dry manure so that it does not exceed agroeconomic standards.

7. develops baseline federal zoning guidelines for food animal production facilities that set a framework for states and require a rigorous, pre-permit environmental impact study and a health impact assessment; such requirements should not prevent states and counties from enacting more comprehensive zoning laws. Impact studies should include assessments of the cumulative effects of food animal production facilities located in vulnerable low-income, minority, and economically distressed communities.

8. The federal government removes exemptions for agricultural operations from the Occupational Safety and Health Act, including exempting agricultural operations from inspection and enforcement of labor laws based on their number of employees.

9. The federal government and state governments increase funding for research on and dissemination of food animal production practices that will be beneficial to the environment, public health, and rural communities and offer funding and technical assistance to farmers to adopt these practices.

10. The federal government eliminates waste management subsidies CAFOs receive under the Environmental Quality Incentive Program (EQIP).

11. The federal government directs EQIP funding and Farm Service Agency loans to small and medium-sized operations rather than CAFOs and requires a rigorous environmental and public health assessment as part of the approval process.

12. The federal government addresses environmental equity issues in permitting decisions for projects with the potential to disparately impact communities protected by Title VI of the Civil Rights Act of 1964.

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Maryland Supports Poultry Industry Reform

News release | Blogpost | Survey results | Infographics (4)

Summary of Findings

Our 2016 statewide survey of Maryland voters, with a focus on the Eastern Shore, found that there is broad support for a number of reforms to the poultry industry. Hot spot areas for reform include the issues of who pays for chicken waste removal, the contracting system that leaves seven in ten growers living below the poverty line, practices that harm the environment and jeopardize Maryland's tourist industry, and limits on the number of new chicken houses that can be built.

Methodology

The Johns Hopkins Center for a Livable Future worked with Greenberg Quinlan Rosner (GQR), a public opinion research company, to conduct a survey of Maryland voters to determine perceptions about the poultry industry and attitudes toward reform within the industry. The survey was conducted in 2016 among 500 registered voters across Maryland, with an additional 100 voters from the Eastern Shore for a statewide total of 600.

Key Findings

- Maryland voters believe government should do more to solve problems and meet needs.
- Maryland voters want large chicken processing companies to pay for the removal of excess waste.
- Across party lines, Maryland voters support reforms to the poultry contracting system.
- Maryland voters support a 5-cent per chicken fee on processing companies that would be dedicated to protecting the environment.
- Maryland voters support measures that would allow local areas to limit new poultry houses and number of chickens.
- Maryland voters said they would feel more favorably toward a legislator who supports increased oversight.

For more information about the survey and its findings, please contact Robert Martin, director of the Food Policy Program at CLF: rmarti57@jhu.edu

GREENBERG QUINLAN ROSNER RESEARCH

October 27, 2016

A Stronger, Fairer Poultry Industry for Maryland

Findings from a Survey of Maryland Voters

To: Interested Parties

From: Greenberg Quinlan Rosner Research

A recent survey of Maryland voters conducted for the Johns Hopkins Center for a Livable Future indicates that Marylanders both recognize the importance of the poultry industry and industrial chicken farming to the state's economy and support actions that will strengthen the industry for everyone in the state. Even in the face of pushback on fiscal arguments, voters—including in the Eastern Shore counties where the industrial poultry industry has a strong presence—support more oversight of the industry as a way of creating a fairer and more equitable system and protecting the health and wellbeing of Maryland residents.

Voters not only broadly support increasing oversight of the industrial chicken farming industry, but also back specific proposals that help that effort. This includes requiring large poultry processing companies to pay their fair share for the removal of excess waste from their contract growers in the state, as well as a proposal to encourage local governments to pass public health laws that limit the number of chickens that can be contained in a specific area.

There is clear support for action here, and voters also express willingness to reward state legislators who take action on these issues, with majorities of voters saying they would be more favorable toward a lawmaker who supports proposals to increase oversight of the industrial chicken farming industry.

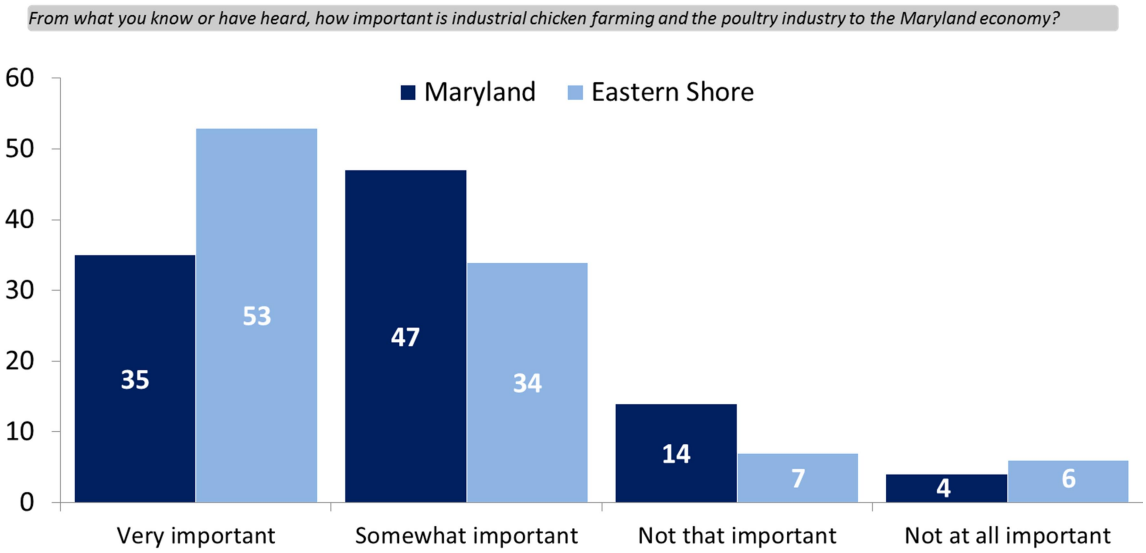
The following findings are based on an online survey of 500 registered voters in the state of Maryland, including an oversample of 100 voters in the Eastern Shore, for a total of 600 interviews, weighted to reflect a representative sample of Maryland voters. The results of the survey, conducted August 18-28, 2016, are subject to a margin of error of +/- 4.0 percentage points at a 95 percent confidence level.

Voters recognize the importance of Maryland's poultry industry, but also see a role for government in overseeing and strengthening the industry

Voters across the state understand that the poultry farming industry plays a big role in the state's economy; 82 percent of voters statewide believe the industrial chicken farming industry is very or somewhat important to the Maryland economy. Not surprisingly, voters in the Eastern Shore express even more intensity on this notion—87 percent believe the industrial chicken

farming industry is very or somewhat important to the Maryland economy, with more than half who think the industry is very important to the economy.

Figure 1: Importance of industrial chicken farming industry on MD economy



However, voters also express confidence in governmental institutions and believe that government can play a role in improving the industrial poultry farming industry. Maryland voters view both the Maryland Department of the Environment (36 – 23 percent favorable-unfavorable) and the Maryland Farm Bureau (26 – 21 percent favorable-unfavorable) positively. Among voters in the Eastern Shore, the Farm Bureau's standing is even stronger (36 – 20 percent favorable-unfavorable), while the Department of the Environment receives positive ratings (41 – 28 percent favorable-unfavorable) that are comparable to voters statewide.

Most importantly, most voters in the state (61 percent) fundamentally believe that government has a role in working to improve problems in the state versus leaving businesses and individuals to handle issues on their own (38 percent). Even in in the Eastern Shore where voters are more reticent initially on government's role in industry, nearly half think government should do more.

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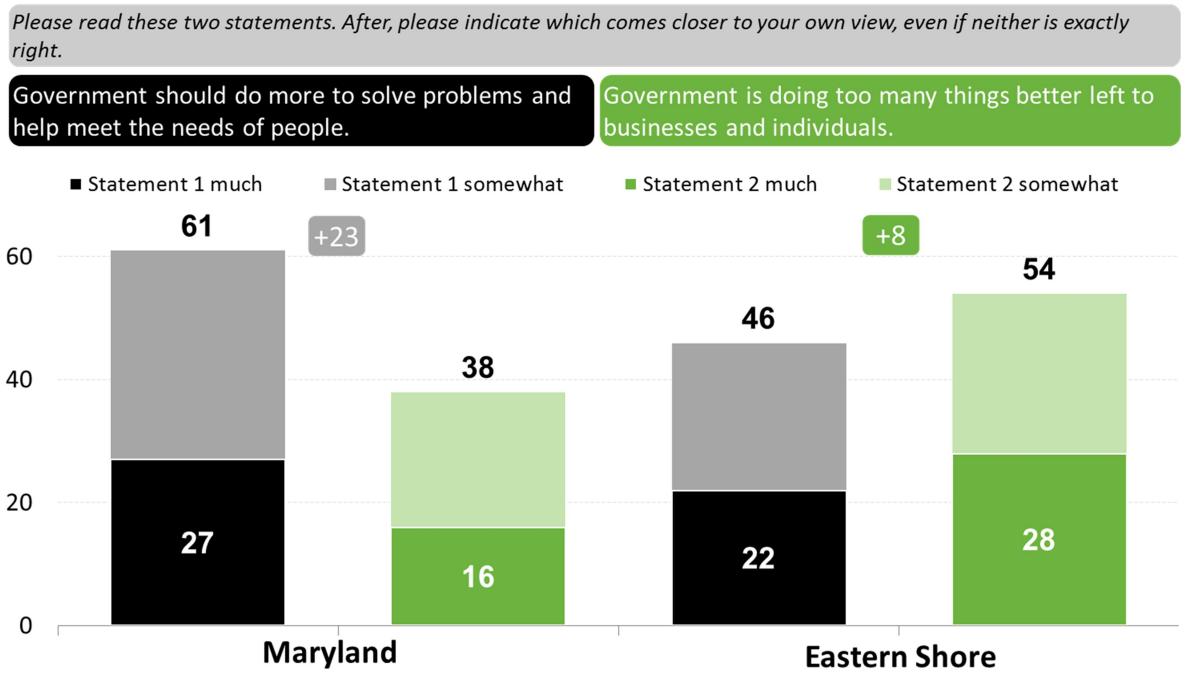
Figure 2: General support for role of government



A strong desire exists for more oversight on handling waste from industrial chicken farms initially, while voters are more mixed on oversight of operations generally

Voters statewide come to this issue with strong support for more oversight of the industrial chicken farming industry broadly and with respect to the handling of chicken waste specifically. More than half of voters in the state (52 percent) want more oversight of the industry, while only 8 percent believe oversight should be decreased. Fifty-nine percent of voters want more oversight of the management of chicken waste.

Voters in the Eastern Shore are equally as eager to see more oversight on the handling of chicken waste; however, they are more reluctant about additional oversight broadly (39 percent want increased oversight), with a plurality of 47 percent who favor the current levels of oversight.

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Figures 3 and 4: Initial measure of support for more oversight of industrial chicken farming industry

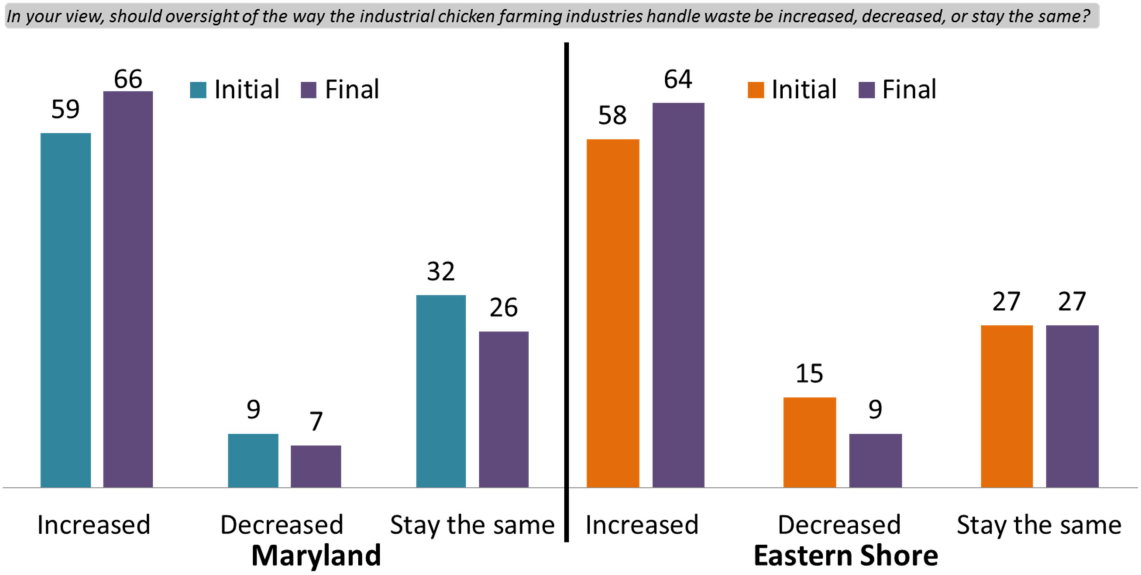
Oversight should be…	% of all Maryland voters	% of Eastern Shore voters
Increased	52	39
Stay the same	40	47
Decreased	8	14

Oversight of handling chicken waste should be…	% of all Maryland voters	% of Eastern Shore voters
Increased	59	58
Stay the same	32	27
Decreased	9	15

Playing out the debate on both sides produces strong movement toward support for more oversight of the industrial chicken farming industry, including among voters in the Eastern Shore

Educating voters produces a real impact here, and voters across the state—and particularly in the Eastern Shore counties—show stronger support for increased oversight after hearing arguments in favor of and against making changes to the way the chicken farming industry operates. Statewide, the number of voters who want an increase in the oversight of the handling of chicken waste jumps from 59 to 66 percent; in the Eastern Shore, the increase is from 58 to 64 percent. Support also increases disproportionately among voters with children, women, and voters under the age of 50.

Figure 5: Increase in support for more oversight of handling of chicken waste after balanced debate



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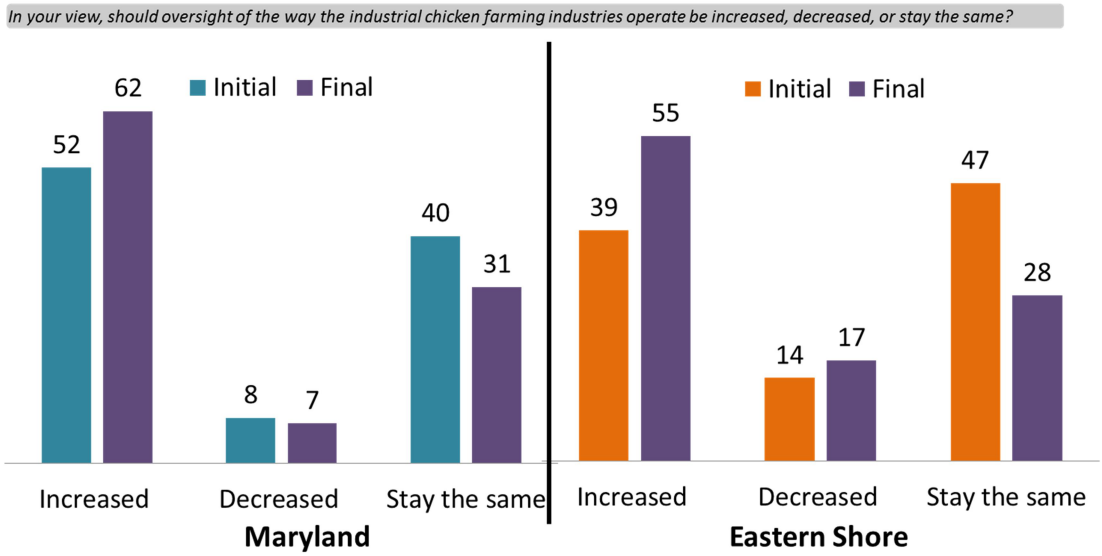
Importantly, support for broadly increasing oversight of the chicken farming industry also increases among voters statewide and in the Eastern Shore in particular. The desire for more oversight increases by 10 points, from 52 to 62 percent, among all Maryland voters. More impressively, the debate moves the more reluctant voters in the Eastern Shore from 39 percent supporting more oversight initially to a majority of 55 percent supporting after information.

Figure 6: : Increase in support for more broad oversight of industrial chicken farming industry



Voters overwhelmingly support specific proposals to improve the chicken farming industry; support holds up against tough economic pushback

Voters maintain support for more oversight of the industrial chicken farming industry when presented with specific proposals to strengthen the industry and protect the state's residents, farmers, and environment. Large majorities of voters statewide and in the Eastern Shore support these measures, including:

- *Require large poultry processing companies to pay for the removal of excess chicken waste from their local contract growers* – 86 percent support among Maryland voters; 84 percent support among voters living on the Eastern Shore

- *Encourage local counties and communities to pass public health laws that limit the construction of new poultry houses and the number of animals that can be contained in one area* – 76 percent support among Maryland voters; 71 percent support among voters living on the Eastern Shore

Even after voters hear arguments for and against these proposals[1], support remains strong, with more than 7-in-10 voters supporting each of the proposals. The post-argument support for these proposals is encouraging in that there is no real shift even after voters hear tough economic arguments that these measures could lead to higher costs, job losses, and businesses leaving.

[1] The full text of arguments for and against the proposals is included in the attached appendix.

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Figure 7: Increase in support for specific proposals after information

Proposal	Maryland		Eastern Shore	
	Initial	Post Argument	Initial	Post Argument
Processing companies pay for removal of excess waste	86-14	86-13	84-16	83-17
Local areas pass public health laws limiting new poultry houses and number of animals	76-24	78-22	71-29	72-28

Two themes stand out as most powerful for voters in support of these proposals, centering on improving economic fairness and protecting residents' health and wellbeing:

- Voters want to ensure the industrial chicken farming industry works for all who participate, including the individual growers and the broader economy. They favor plans that require the large processing companies to pay their fair share of managing chicken waste removal instead of making taxpayers and growers bear the burden.

- Voters want to make sure that there is oversight requiring the industrial chicken farming industry to monitor and pay for cleanup of the environmental impacts of the industry, and promote industry practices that keep Maryland's air and water clean and safe.

Maryland voters are willing to reward legislators who support increased oversight of the industrial chicken farming industry

Voters are not only supportive of increased oversight over the industrial chicken farming industry in Maryland, but also express a willingness to reward legislators who support action on the issue. A strong majority of voters statewide (58 percent) say they would be more favorable toward their state legislator if he or she supported proposals to increase oversight of the industrial chicken farming industry. This also includes 58 percent of voters in the Eastern Shore who would look more favorably toward state legislators. This indicates that this is an issue that legislators can be comfortable talking about and taking action on with the support of their constituents.

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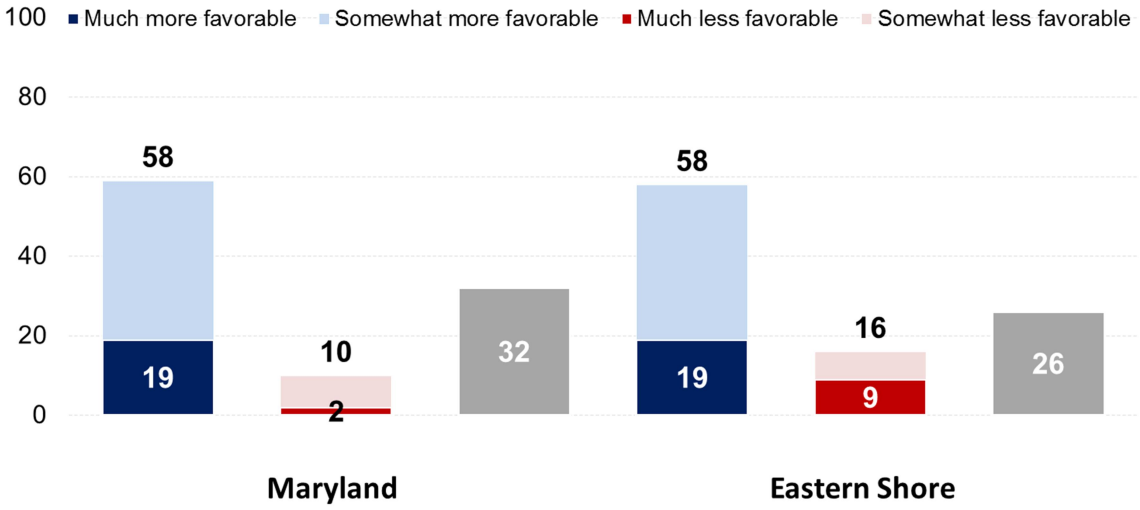
Figure 8: Impact on legislators' standing if supporting more oversight

Thinking about everything you have read, if your state legislator supported proposals to increase oversight of the industrial farming industry, would that make you more or less favorable toward him or her, or would it make no difference?



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APPENDIX A: Arguments in favor of changes to the industrial chicken farming industry

Argument	% Very Convincing (all MD)	% Total Convincing (all MD)	% Very Convincing (Eastern Shore)	% Total Convincing (Eastern Shore)
[250 Respondents] (WATER RUNOFF - WELL MONITOR) The pollution caused by run-off from chicken waste often contains heavy metals and drug residues that can contaminate public drinking water supplies and private wells and cause kidney failure, liver disease, birth defects, or other illnesses. We need to require big poultry corporations to take responsibility for monitoring water supplies and private wells for contamination	50	83	40	72
(TAX FAIRNESS) Maryland taxpayers currently pay millions of dollars each year to subsidize the removal of chicken waste from local chicken farms, while big poultry corporations make billions of dollars in profits while paying little costs. We need to make these big corporations pay their fair share for the removal of the waste they produce	47	79	47	75
(LOCAL BURDEN) Big corporate poultry producers make billions of dollars in profits a year, while most local Maryland chicken growers live below the poverty line. Yet these local farmers are solely responsible for bearing the costs of disposing of chicken waste, while the big corporations pay little. Big poultry corporations should share in the cost of dealing with this problem by paying for the removal of waste from local chicken farms.	45	78	45	74
[250 Respondents] (WATER RUNOFF - PAY CLEANUP) The pollution caused by run-off from chicken waste applied to land carries pathogens, viruses, and bacteria like E.coli, some of which can cause kidney failure, liver disease, birth defects, or other illnesses. We need to make sure big poultry corporations do their part to keep Maryland's drinking water supply safe from the effects of chicken waste runoff.	43	77	47	73

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Argument	% Very Convincing (all MD)	% Total Convincing (all MD)	% Very Convincing (Eastern Shore)	% Total Convincing (Eastern Shore)
[250 Respondents] (QUAL OF LIFE) Maryland residents and families deserve to enjoy a good quality of life, without dealing with the mess and smell created by chicken waste and the big poultry industry. We need to pass reasonable methods of oversight that balance a successful poultry industry with making sure Marylanders can enjoy their property and communities.	39	78	24	63
(RESPIRATORY) Allowing unregulated growth and expansion of poultry farms can create serious health risks for poultry workers and local communities. Emissions from these farms create foul odors and have been linked to higher levels of asthma, chronic bronchitis, and respiratory problems in people living nearby poultry operations. We need to limit the number and density of animals within individual poultry houses to protect the air we breathe.	38	74	43	69
[250 Respondents] (TOUR/ECONOMY) The local economies of Maryland and the Eastern Shore rely heavily on tourism and recreation, and we need to pass reasonable measures that balance building a successful poultry industry with protecting our vital tourist industry.	28	67	37	72

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APPENDIX B: Arguments against changes to the industrial chicken farming industry

Argument	% Very Convincing to Oppose (all MD)	% Total Convincing to Oppose (all MD)	% Very Convincing to Oppose (Eastern Shore)	% Total Convincin to Oppos (Eastern Shore)
(TAX KILL JOB) Maryland businesses already face high taxes that make it hard to grow and create jobs. Putting new taxes and fees on the industrial farming industry will only encourage poultry companies to take their business to other states, costing the state's economy billions of dollars and thousands of jobs.	17	54	18	55
(SAFETY/VOLUNTARY MEASURES) Poultry companies work hard to make sure their facilities are safe and healthy and to limit any impact on the community. Poultry producers like Perdue have voluntarily introduced measures to reduce potential risks, like eliminating the use of antibiotics in their chickens, because they are good business practices. Instead of adding more government regulation, we should encourage businesses to voluntarily adopt environmentally-friendly, healthy practices.	14	54	20	49
(OVERREGULATION) There are already plenty of laws in place regulating the industrial chicken farming industry, and we do not need more red tape and regulations that will hurt our state's local growers.	10	41	9	42
(HURT SMALL BIZ) Shifting the responsibility and "ownership" of chicken waste from local growers to processing companies will hurt the small local farms who currently rely on those materials to use as fertilizer or to make profit by selling to other customers.	9	42	11	43

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