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CAFO's are a Public Health Crisis: The Creation of COVID-19

Helena Masiello

University of Miami School of Law

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CAFO's are a Public Health Crisis: The Creation of COVID-19

HELENA MASIELLO*

Concentrated Animal Feeding Operations (“CAFO’s”) are largely unregulated by State or Federal Laws in the United States. As a result of this lack of oversight, they are a breeding ground for deadly infectious diseases. The COVID-19 epidemic has demonstrated the threat that diseases pose to the United State like H1N1, SARS, and Ebola. The USDA needs to regulate CAFOs under the mandate given to them by congress in the AHPA to ensure that they are not the epicenter of the next wave of deadly infectious diseases. Scientists have been warning about the disease potential of CAFOs for the last decade, and it is time for policy makers to listen and take action.

* J.D. 2022, University of Miami School of Law; B.A. 2019, Georgetown University. Thank you so much to Professor Owley, Professor of Law and Faculty Director for the Environmental Law Program at the University of Miami, for all your guidance and support during this writing process.

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INTRODUCTION

You might guess the United States Department of Agriculture (“USDA”) oversees farm animal conditions, but you’d be wrong. The USDA has the ability to regulate farm animal conditions under the Animal Health Protection Act (“AHPA”), but they are not using it.¹ Meanwhile, The FDA has minimal authority to regulate animal conditions under the FDCA and PHSa, but regulation isn’t sufficiently funded.² This regulatory gap is worrisome because unhealthy farm practices have a direct impact on human health—

¹ *Detection, Control, and Eradication of Diseases and Pests*, 7 U.S.C § 8308(a) (2012) (“The Secretary may carry out operations and measures to detect, control, or eradicate any pest or disease of livestock (including the drawing of blood and diagnostic testing of animals), including animals at a slaughterhouse, stockyard, or other point of concentration.”).

² See Anastasia S. Stathopoulos, Note, *You Are What Your Food Eats: How Regulation of Factory Farm Conditions Could Improve Human Health and Animal Welfare Alike*, 13 N.Y.U. J. LEGIS. & PUB. POL’Y 407, 436–437 (2010); U.S. FOOD & DRUG, FDA AT A GLANCE 1 (2020), <https://www.fda.gov/media/143704/download> (the FDA has a discretionary authority because they have a myriad of other responsibilities and a 2020 budget of only about \$5.9 billion).

factory farms contribute to the spread of zoonotic diseases and antibiotic resistance.³

Concentrated Animal Feeding Operations (“CAFOs”) are unsanitary and create a breeding ground for disease.⁴ Studies have found that the densities of animals on factory farms, specifically CAFOs, creates an increase in transmission of zoonotic diseases (diseases in animals) as well as recurrent infections.⁵ In factory farms, infectious zoonotic diseases can spread between the domestic animal species, the factory workers, and the rest of the local human population.⁶ Zoonotic diseases can spread from animals to workers through the air, untreated waste, water, and direct contact with bodily fluids.⁷ Additional examples of infectious diseases are H1N1, SARS, and Ebola.

The H1N1 virus is an example of how CAFOs can create zoonotic diseases that spread to humans. Notably, twenty-five years ago, the transmission of diseases like influenza from chickens was almost non-existent and now serious outbreaks occur in humans every year.⁸ Health experts have warned that if avian influenzas, like H7N9, continue to appear on factory farms they could potentially result in an epidemic that is “much greater than the great pandemic of 1918” that globally killed an estimated 50 million people and was

³ See Stathopoulos, *supra* note 2, at 420, 430. Swine Flu in the early 2000s was an infectious disease outbreak that originated in a CAFO.

⁴ Stathopoulos, *supra* note 2, at 437.

⁵ Rob Wallace et al., *Covid-19 and Circuits of Capital: New York to China and Back*, MONTHLY REV. ARCHIVES 7–8 (Mar. 27, 2020), <https://fighttwin.noblogs.org/files/2020/06/Rob-Wallace-et-al.-COVID-19-and-Circuits-of-Capital.pdf>.

⁶ Roberto Saenz, *Confined Animal Feeding Operations as Amplifiers of Influenza*, VECTOR BORN ZOO NOTIC DIS. 1 (2006) (“A mathematical model is used to examine the transmission dynamics of a new influenza virus among three sequentially linked populations: the CAFO species, the CAFO workers (the bridging population), and the rest of the local human population.”).

⁷ See James E. Hollenbeck, *Interaction of the Role of Concentrated Animal Feeding Operations (CAFOs) in Emerging Infectious Diseases (EIDS)*, INFECT GENET. EVOL 44–46 (Dec 2, 2015); Zoonotic Diseases, CDC, (Jul. 1, 2021), <https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html>.

⁸ See also David Wiebers & Valery Feigin, *What The COVID-19 Crisis Is Telling Humanity*, Neuroepidemiology 1, 2 (June 4, 2020), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7316645/pdf/ned-0001.pdf>.

more deadly than COVID-19, which as of 2022, has killed almost 1 million people in the United States.⁹

Congress has explicitly acknowledged, in the Animal Health Protection Act (“AHPA”), that infectious diseases in livestock pose a threat to the “health and welfare of the people of the United States,” and gave the USDA indirect broad authority to regulate the conditions of factory farms to prevent outbreaks.¹⁰ The USDA has chosen not to use this statutory authority. The unregulated conditions of factory farms have many negative impacts, but this paper will focus on the public health prevention of infectious diseases.

This article argues that factory farming is creating and amplifying infectious diseases like H1N1, with pandemic potential similar to COVID-19 and, therefore, that the USDA needs to regulate factory farms to prevent these outbreaks. Part II addresses the size and scope of the disease health threat that factory farming poses to Americans. Part III discusses more threats it presents to American health like antibiotic resistance. Finally, part IV proposes policy reforms for the USDA going forward.

I. A MASSIVE PROBLEM: THE SCOPE OF THE HEALTH THREAT

The large populations and densities of animals on factory farms, known as CAFOs, facilitate greater transmission of diseases in animals as well as recurrent infections.¹¹ These large facilities provide a unique breeding ground for new infectious diseases because they “provide an unnaturally high concentration of animals with limited air space, and waste removal, which allows for the rapid selection of, amplification, and with the rapid transportation of animals from one site to another, and results in never before spread of zoonotic pathogens on such a large scale.”¹² When animals are confined in circumstances that are different from their natural behavior, viruses

⁹ *Id.*; *Trends in Number of COVID-19 Cases and Deaths in the US Reported to CDC, by State/Territory*, CDC, https://covid.cdc.gov/covid-data-tracker/#trends_dailydeaths (last visited Apr. 12, 2022).

¹⁰ 7 U.S.C § 8308(a) (2012) (“The Secretary may carry out operations and measures to detect, control, or eradicate any pest or disease of livestock (including the drawing of blood and diagnostic testing of animals), including animals at a slaughterhouse, stockyard, or other point of concentration.”).

¹¹ See Wallace et al., *supra* note 5, at 8.

¹² Hollenbeck, *supra* note 7, at 44–45.

can mutate and become novel strains that can survive in other hosts, like humans.¹³

There are thousands of CAFOs in the United States, and each farm has the potential to breed zoonotic diseases.¹⁴ CAFOs in the United States are statutorily defined as a Large Concentrated Animal Feeding Operation (CAFO), a facility that meets at least one of these categories: 700 dairy cows, 1,000 veal calves, 2,500 swine, 500 horses, 10,000 sheep or lambs, 30,000 laying hens or broilers, 125,000 chickens, or 30,000 ducks.¹⁵ Medium CAFOs are defined as factory farms with about half those numbers of animals, and Small CAFOs are factory farms that have fewer number of animals than those designated as medium.¹⁶ These numbers put into perspective the scope of the zoonotic disease threat.

A. *Unsanitary Conditions of CAFOS*

CAFOs are unsanitary and create a breeding ground for disease.¹⁷ CAFOs are industrial facilities that by definition, raise huge numbers of farm animals in intensive confinement.¹⁸ In CAFOs, animals are confined to cages, crates, or crowded pens and common conditions include: overcrowding, rough or abusive handling by workers, indoor confinement with poor air and light, inability to engage in natural behaviors, illness and injuries left untreated, and an overreliance on antibiotics.¹⁹ It is common to rely on antibiotics to compensate for stressful and unsanitary conditions, and this practice

¹³ *Id.*

¹⁴ See FOOD & WATER WATCH, FACTORY FARM NATION: 2020 EDITION 1 (2020), https://www.foodandwaterwatch.org/sites/default/files/ib_2004_updfacfarmmaps-web2.pdf (As of 2020, there are estimated to be about 25,000 factory farms in the U.S.).

¹⁵ Concentrated Animal Feeding Operations, 40 C.F.R. §122.23(b)(4)(i)–(xiii) (2021).

¹⁶ 40 C.F.R. §122.23(b)(6)–(9).

¹⁷ Stathopoulos, *supra* note 2, at 409.

¹⁸ 40 C.F.R. §122.23(b)(4)–(9).

¹⁹ *The Problem with Factory Farming*, ASPCA, <https://www.aspc.org/protecting-farm-animals/problem-factory-farming> (last visited Nov. 18, 2021) (“In polling, 94% of Americans agree that animals raised for food deserve to live free from abuse and cruelty. Yet the majority of the nearly 10 billion land-based animals,” do not live this way).

has a direct and harmful impact not only on animal health, but also on human health.²⁰

There are approximately 25,000 CAFOs in the United States,²¹ and in 2019, the USDA collected data and found that 99% of US farmed animals live in CAFOs.²² The scope of the risk of infectious disease outbreaks from CAFOs is massive, America's factory farms currently contain 1.6 billion animals.²³ Notably, government agencies have not published an up to date count on exactly how many CAFOs exist nationwide.²⁴ Since 2012, CAFOs have increased by fourteen percent, adding 190 million animals to factory farms.²⁵ In contrast, smaller-run farming operations have decreased by fifteen percent throughout that same period.²⁶

A high output of industrial production within CAFOs has created a continually renewing supply of diseases at regional levels and within farms.²⁷ Housing lots of animals together actually rewards strains of diseases that can burn through the animals fastest.²⁸ Since humans are animals as well, we are creating conditions for pathogens that will burn through *us* the fastest.²⁹ Unlike smaller farms,

²⁰ *Id.*; see Mackenzie Aime, *The Next Pandemic Could Come From A US Factory Farm*, FOOD & WATER WATCH (May 2, 2020) (“70 percent of the total volume of medically important antibiotics in the US are sold for animal agriculture.” As a result of this overuse, “rise of drug-resistant superbugs, MRSA for example, puts our collective public health at risk and could have dire consequences in future pandemics, especially those that have bacterial complications like pneumonia.”).

²¹ FACTORY FARM NATION, *supra* note 14, at 1 (as of 2020, there are estimated to be about 25,000 factory farms in the U.S.).

²² Jacy Reese Anthis, *U.S. Factory Farming Estimates*, SENTIENCE INSTITUTE (Apr. 11, 2019), <https://www.sentienceinstitute.org/us-factory-farming-estimates>.

²³ FACTORY FARM NATION, *supra* note 14, at 1.

²⁴ REPORT TO CONGRESSIONAL REQUESTERS: CONCENTRATED ANIMAL FEEDING OPERATIONS, GAO (Sept. 2008) <https://www.gao.gov/assets/gao-08-944.pdf> (In 2008 the EPA was found to “not have data on the number of and location of CAFOs nationwide,” and to this day they have not obtained the information).

²⁵ FACTORY FARM NATION, *supra* note 14, at 1.

²⁶ *Id.*

²⁷ Wallace et al., *supra* note 5, at 8.

²⁸ *Id.*

²⁹ See Cynthia Schuck-Paim, *Intensive Animal Farming Conditions Are a Major Threat To Global Health*, ANIMALS SENTIENCE 1 (2020),

CAFOs usually slaughter chickens at only six weeks of age.³⁰ As a result, pathogens created in CAFOs are more able to survive in robust young immune systems, because they spread in younger and healthier chickens.³¹

The more animals that are held together in close quarters, the higher the chance that infectious diseases will spread through them and spread to the human workers who handle them; on average, about twenty-five million farm animals are slaughtered every day in the United States.³² Every day, thousands of farm animals are packed together spreading diseases, but the diseases don't die with their slaughtering, because there is a constant supply of new hosts as animals are continually funneled through factory farms. In CAFOs, with every daily mass slaughter of animals, new diseases are spreading and jumping from one animal to another, like the H1N1 outbreak, and we are creating a world more deadly to humans. Zoonotic diseases are more likely to spread through livestock than wild animals because of the high concentration of animals in a closed space, and human workers interact with them.³³

CAFOs provide a massive infectious threat, and COVID-19 has demonstrated that such a threat should not be underestimated or ignored.

B. *How CAFOs Can Spread Infectious Diseases*

Currently, livestock species take up more biomass than all the other wild animals combined, creating a much larger potential for dangerous animal viruses to spread to humans.³⁴ There are about 1.7 million undiscovered viruses in animals.³⁵ Research suggests that:

<https://www.wellbeingintlstudiesrepository.org/cgi/viewcontent.cgi?article=1635&context=animsent>.

³⁰ Wallace et al., *supra* note 5, at 8.

³¹ *Id.*

³² *Id.*; Facts—*Farm Animals*, Animal Matters, <http://www.animalmatters.org/facts/farm/#:~:text=Approximately%2025%20million%20farm%20animals,day%20in%20the%20United%20States.&text=Approximately%20nine%20percent%20%E2%80%94%20more%20than,stress%2Dinduced%20disease%20or%20injury> (last visited Nov. 18, 2021).

³³ Schuck-Paim, *supra* note 29, at 1.

³⁴ *Id.*

³⁵ See also Sophie Attwood & Cother Hajat, *How Will the Covid-19 Pandemic Shape the Future of Meat Consumption?*, 23 CAMBRIDGE CORE 3116, 3116

(1) novel infectious diseases created in CAFOs can spread to the workers; (2) in a process called amplification, CAFOs can make existing infectious diseases worse; and (3) viruses can spread from CAFOs to workers or surrounding communities through contaminated meat, air, water, and odors.³⁶

First, research shows that CAFOs can create breeding grounds where viruses can spillover from animals to humans; one recent model based on data from hog farms shows that “workers at these facilities, being in close proximity to animals and thus at increased risk of contracting a virus, can be a “bridging population for transmission of diseases from pigs to humans.”³⁷ The study suggests, that if CAFO workers made up fifteen to forty-five percent of a given community, which is common in some rural areas—human influenza cases in that community could increase by forty-two to eighty-six percent.³⁸ Specifically, multiple studies have confirmed that the exposure of factory farm workers to pigs increases the risk of swine influenza infection in humans.³⁹

Second, the spread between factory farm animals and humans does not just start as an origin of zoonotic viruses. Factory farms can amplify existing viruses and make epidemics worse through a process called amplification.⁴⁰ Specifically, “[a]mplification occurs if the size of the epidemic in humans is increased due to transmission of the influenza virus into the CAFO species which leads to an epidemic in the CAFO species, and subsequent transmission back to the local human population.”⁴¹ This means that CAFO workers can become sick with infectious diseases that originate outside their jobs, and then when they interact directly or indirectly with animals in the CAFOs, they can spread the disease through the animal

(Aug. 12, 2020), <https://www.cambridge.org/core/journals/public-health-nutrition/article/how-will-the-covid19-pandemic-shape-the-future-of-meat-consumption/1E58577A80363EF5DD3AE7E2C47ED860>.

³⁶ See *infra* Part II, III.

³⁷ Saenz, *supra* note 6, at 1; Matt Wellington, *Factory Farms a Pandemic in the Making*, U.S. PIRG (Apr. 24, 2020) <https://uspig.org/blogs/blog/usp/factory-farms-pandemic-making>.

³⁸ Saenz, *supra* note 6, at 1.

³⁹ *Id.* at 2; see also Schuck-Paim, *supra* note 29, at 1.

⁴⁰ *Id.*

⁴¹ *Id.*

species, which gives it a chance to mutate and become worse and then re-infect the workers with a more dangerous strain of the disease.⁴²

Third, zoonotic diseases can spread from animals to workers or neighboring populations through diseased meat, air, untreated waste, and direct contact with bodily fluids.⁴³ The Center for Disease Control (“CDC”) states that zoonotic spread between animals and people when factory workers touch animals on CAFOs because contact with saliva, blood, urine, mucous, feces, or other body fluids of an infected animal can infect humans.⁴⁴ CAFO workers are also particularly susceptible to zoonotic diseases because they can spread through indirect contact—contact with areas where animals live and roam, or objects or surfaces that have been contaminated with germs.⁴⁵ Factory workers and neighboring human populations are susceptible to infectious diseases that breed in CAFOs that can spread by vector borne emissions (contact with a tick, mosquitos, or flea), foodborne emissions (eating contaminated undercooked meat), and waterborne emissions (drinking or coming into contact with water that has been contaminated with the feces of infected animals).⁴⁶

Additionally, CAFOs produce dust which can contain disease particles that make neighboring human communities sick.⁴⁷ Dust from CAFOs have been found to contain biologically active organisms such as bacteria, and this dust has proven to pose a health hazard.⁴⁸ In 2015, a study of swine CAFOs found that twenty percent of the workers suffered from Organic Dust Toxic Syndrome (“ODTS”).⁴⁹ ODTS is an acute influenza-like illness that occurs after four to six hours of intense exposure to agricultural dust. The airborne emissions from CAFOs act as vectors for airborne viruses and as one scientist put it, “with so many swine and poultry CAFOs

⁴² *See id.*

⁴³ *See* Hollenbeck, *supra* note 7, 44–45; Zoonotic Diseases, *supra* note 7.

⁴⁴ Zoonotic Diseases, *supra* note 7.

⁴⁵ Hollenbeck, *supra* note 7, at 45.

⁴⁶ *See* Zoonotic Diseases, *supra* note 7; *See* Hollenbeck, *supra* note 7, at 45.

⁴⁷ Hollenbeck, *supra* note 7, at 45.

⁴⁸ *Id.*

⁴⁹ *Id.*

in proximity, the acceleration of the mixing and assortment of influenza viruses is unfathomable.”⁵⁰

With multiple points of transmission, CAFOs pose an infectious disease threat to human communities.

C. *Federal and State Laws for Regulating CAFOs Are Basically Non-Existent*

With the high infectious disease threat from the crowded and unsanitary condition of animals on CAFOs you would assume that federal laws in the United States would regulate the conditions of farm animals, but few laws regulate standards of care. The Federal Animal Welfare Act—a law that provides minimum standards of care for dogs and cats—exempts farm animals.⁵¹ In fact, *no* federal laws are specifically tailored to protect animals on farms.⁵²

The Humane Methods of Slaughter Act is one of the few federal laws that regulates the slaughtering of livestock, not conditions on the farm before slaughtering, but it excludes poultry which accounts for 98% of animals raised for food.⁵³ There are no rules about slaughtering chickens. This regulatory hole is a problem because if the conditions of farm animals on CAFOs are not regulated, their zoonotic infectious threat will continue to pose a risk to the health of humans.

Congress knows factory farms are a major disease threat to humans because Congress passed the Animal Health Protection Act (“AHPA”), to prevent and control livestock diseases and pests, and it gives the USDA indirect authority to regulate the conditions of animals on farms.⁵⁴ Congress plainly stated in the AHPA that “the prevention, detection, control, and eradication of diseases and pests

⁵⁰ *Id.*

⁵¹ *See Humane Method of Slaughter Act*, 7 U.S.C. § 1902 (2018) (humane slaughter laws are limited to “cattle, calves, horses, mules, sheep, swine, and other livestock” and, has not been interpreted to include poultry); *see also* *Clay v. N.Y. Cent. R. Co.*, 224 A.D. 508, 511-512 (App. Div. 1928) (holding that the Twenty-Eight Hour Law applies only to “cattle, sheep, swine, and other animals” but does not apply to poultry); *see also* *The Problem with Factory Farming*, *supra* note 19.

⁵² *Id.* There are federal animal cruelty acts, but they precisely *exclude* poultry. There are no laws protecting chickens as a result.

⁵³ 7 U.S.C. § 1902 (Cattle, sheep, swine, goats, horses, mules, and other equines, but not poultry are regulated).

⁵⁴ 7 U.S.C § 8308(a) (2012).

of animals are essential to protect animal health and the health and welfare of the people of the United States.”⁵⁵ As a result of the infectious health threat to both animals and humans, the AHPA gives the USDA broad authority to “carry out operations and measures to detect, control, or eradicate any pest or disease of livestock, including animals at slaughterhouse, stockyard, or other point concentration.”⁵⁶

Congress was clear in the language of the AHPA that the threat of livestock diseases posed a threat to the health and welfare of the people of the United States, and, yet, the USDA has not used this authority to regulate farm conditions.⁵⁷ On the USDA’s website, on April 28, 2020, they answered the question—why doesn’t the USDA do more to protect the welfare of farm animals?⁵⁸ The USDA answered by deflecting the problem and said that the “primary authority for regulating CAFOs rests with State and local governments . . . congressional action would be required to modify the Animal Welfare Act (“AWA”) to include Federal regulation of animals in CAFOs.”⁵⁹ The USDA failed to acknowledge that Congress gave them statutory authority under the AHPA. The USDA deflects the regulation of animal conditions on factory farms, even though Congress gave them authority to regulate livestock to prevent diseases.⁶⁰

The treatment of animals on factory farms directly affects the health and welfare of humans, however, the USDA attempts to separate the two issues and deflect regulatory authority to state and local governments. This deflection is putting Americans at risk, because a majority of states expressly *exempt* farm animals from anti-

⁵⁵ 7 U.S.C § 8301(1) (2012).

⁵⁶ 7 U.S.C § 8308(a) (2012).

⁵⁷ *Detection, Control, and Eradication of Diseases and Pests*, 7 U.S.C § 8308(a) (2012) (“The Secretary may carry out operations and measures to detect, control, or eradicate any pest or disease of livestock (including the drawing of blood and diagnostic testing of animals), including animals at a slaughterhouse, stockyard, or other point of concentration.”).

⁵⁸ See 7 U.S.C § 8308(a) (2012) (Congress has explicitly acknowledged, in the Animal Health Protection Act (“AHPA”), that infectious diseases in livestock pose a threat to the “health and welfare of the people of the United States.”). *AskUSDA*, USDA (Apr. 28, 2020), <https://ask.usda.gov/s/article/Why-doesnt-the-United-States-Department-of-Agriculture-do-more-to-protect-the-welfare-of-farm-animals>.

⁵⁹ *Id.*

⁶⁰ 7 U.S.C § 8308.

cruelty provisions, which would alleviate the conditions that create diseases.⁶¹ In fact, rather than reform, anti-whistleblower bills are popping up across the country, making it illegal to document and report animal abuse.⁶² Importantly, animals are not the only victims of these inhumane conditions; general consumer health, rural communities, farmers, workers, the environment, and the public's health are all being harmed by the intensive farming systems used on factory farms.⁶³

D. *When the Viruses of Birds and Pigs Fly*

The scope of the danger presented by Congressional failure, and the USDA's failure to regulate CAFOs and the factory farming industry, can be seen in outbreaks of bird and pig flus. CAFOs are breeding grounds for emerging infectious diseases ("EID"), defined by scientists as an infectious disease which has become more dangerous following its first introduction into a new host population or it is introduced into an existing host population in a new environment.⁶⁴ Examples of EIDs include H1N1, SARS, and Ebola.

From April 12, 2009, to April 10, 2010, the CDC estimated that in the United States there were 60.8 million cases of H1N1, 274,304 hospitalizations, and 12,469 deaths due to the virus.⁶⁵ Worldwide, the CDC estimates that the H1N1 disease has killed between 151,700 and 575,400 people.⁶⁶ The H1N1 outbreak showed that pigs can not only cause avian, swine, and human influenza viruses, but

⁶¹ *What is Ag-Gag Legislation?*, APSCA, <https://www.aspc.org/improving-laws-animals/public-policy/what-ag-gag-legislation> (last visited Nov. 18, 2021).

⁶² *Id.*; see e.g., ARK. CODE ANN. §16-118-112 (2018).

⁶³ *See Id.*

⁶⁴ Saenz, *supra* note 6.

⁶⁵ *2009 H1N1 Pandemic*, CDC (June 11, 2009), <https://www.cdc.gov/flu/pandemic-resources/2009-h1n1-pandemic.html>.

⁶⁶ *First Global Estimates of 2009 H1N1 Pandemic Mortality Released by CDC-Led Collaboration*, CDC (June 25, 2012), <https://www.cdc.gov/flu/spotlights/pandemic-global-estimates.htm> ("These global estimates are more than 15 times higher than the number of laboratory-confirmed deaths reported to the World Health Organization (WHO). WHO has acknowledged for some time that official, lab-confirmed reports are an underestimate of actual number of influenza deaths.").

also, are ideal carriers to create influenza viruses with pandemic potential.⁶⁷

Twenty-five years ago, the transmission of diseases like influenza from chickens was almost non-existent and now serious outbreaks occur regularly—H5N1 outbreaks occur in humans every year.⁶⁸ In fact, there are more outbreaks from chickens to humans in the past fifteen years than in the *entire* twentieth century combined.⁶⁹ Cynthia Schuck-Paim, a zoologist and researcher on the epidemiology of human and animal diseases, explains the magnitude of the threat to human health when she noted that in just three weeks, from August, 1 to August 20, 2022, there were reports of new outbreaks of the highly infectious avian influenza in twelve different countries.⁷⁰

Additionally, Amesh Adalja of the Johns Hopkins Center for Health Security worries that the relatively new avian influenza, H7N9, is a “hugely concerning” pandemic threat.⁷¹ Beginning in southern China in 2013, there is no evidence of human-to-human transmission yet.⁷² However, more than 1,500 human cases have occurred, and the virus carries a massive fatality rate of forty percent. Adalja warns, “[a]n H7N9 pandemic could well be worse—perhaps much worse—than the great pandemic of 1918” that killed an estimated fifty million people.⁷³ To put that in perspective, as of April

⁶⁷ See Sigal Samuel, *The Meat We Eat Is a Pandemic Risk, Too*, VOX, (Aug. 20, 2020), <https://www.vox.com/future-perfect/2020/4/22/21228158/coronavirus-pandemic-risk-factory-farming-meat>. (“When people became infected with H5N1, it had a 60 percent mortality rate. For comparison, experts estimate that Covid-19’s mortality rate is probably somewhere in the neighborhood of 1 percent to 3 percent, though these estimates continue to evolve and vary widely by country and by age.”).

⁶⁸ See also Wiebers & Feigin, *supra* note 8, at 2.

⁶⁹ *Id.*

⁷⁰ Schuck-Paim, *supra* note 29, at 1 (“In just the last three weeks, from Aug. 01 to Aug. 20, 2020, new outbreaks of HPAI were reported in Australia, Taiwan, Vietnam and Russia, with previously reported outbreaks ongoing in South Africa, Nigeria, Afghanistan, China, India, Korea, Philippines and Bulgaria (OIE 2020). These many new cases provide numerous opportunities for these viruses to mutate or reassort with other strains and at some point acquire the capability of sustained human transmission.”).

⁷¹ Wiebers & Feigin, *supra* note 8, at 3.

⁷² *Id.*

⁷³ *Id.*

12, 2022, COVID-19 has killed over an estimated 6.1 million people worldwide and has a fatality rate of over 1%,⁷⁴ which means H7N9 is more deadly than COVID-19 and could potentially result in substantially more deaths.

Worldwide, as CAFOs continue to expand in size, the infectious threat becomes more serious.⁷⁵ In 2021, intensive poultry CAFOs in Virginia have expanded to hold a million birds,⁷⁶ and worldwide mega-farms can hold as many as ten million birds.⁷⁷ Scientists warned back in 2015, that in China alone there are over ten million reservoirs for EIDs to exist and mutate within.⁷⁸ Terrestrial bird livestock such as chickens, turkeys, and quail, “may serve as a suitable intermediate hosts to influenza to convert to more virulent strains.”⁷⁹ Poultry CAFOs are some of the most common worldwide and in the United States.⁸⁰

For years, the CDC and World Health Organization (“WHO”) have warned about the risk factory farming carries to human health because of CAFOs increased animal susceptibility to infection and disease.⁸¹ The CDC states that, “more than 6 out of every 10 known infectious diseases in people can be spread from animals, and 3 out of every 4 new or emerging infectious diseases in people come from

⁷⁴ WHO *Coronavirus (COVID-19) Dashboard*, World Health Organization (Apr. 11, 2022), <https://covid19.who.int/> (6,179,104 cumulative deaths and 497,057,239 cumulative cases).

⁷⁵ See Hollenbeck, *supra* note 7, at 44–45.

⁷⁶ Lisa Held, *A Huge New Chicken CAFO in West Virginia Has Stoked Community Resistance*, CIVIL EATS (Apr. 7, 2021), <https://civileats.com/2021/04/07/a-huge-new-chicken-cafo-in-west-virginia-has-stoked-community-resistance/>.

⁷⁷ Hollenbeck, *supra* note 7, at 45.

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ Nicholas Kristof, *The Mistakes That Will Haunt Our Legacy*, N.Y. TIMES (July 11, 2020), <https://www.nytimes.com/2020/07/11/opinion/sunday/animal-rights-cruelty.html?searchResultPosition=3> (The largest meat industry in the US is poultry. In 2019, 9.3 billion chickens were slaughtered for consumption).

⁸¹ *Animal Feeding Operations*, CDC (Oct. 11, 2016), <https://www.cdc.gov/healthywater/other/agricultural/afo.html> (Farms may cause “pathogens” including “parasites, bacteria, and viruses which cause disease in humans”.); see also Rooney Mara & Joaquin Pheonix, *Wet Markets Breed Contagions Like The Coronavirus. The U.S. Has Thousands of Them*, WASH. POST (April 21, 2020), <https://www.washingtonpost.com/outlook/2020/04/21/mara-phoenix-wet-market-animal-cruelty/> (“more than half of all human diseases emanate from animals.”).

animals.”⁸² Zoonotic diseases can spread between animals and humans through direct contact and indirect contact, as well as vector-borne, foodborne, and waterborne emissions.⁸³ Currently, farm workers in CAFOs have direct and indirect contact with animals and can potentially spread these diseases through communities, like what happened with the H1N1 virus.⁸⁴

The USDA cannot allow the factory farming industry to police itself.⁸⁵ Congress and the USDA need to take immediate and strong action to protect the future health of the American public. The unsanitary conditions of factory farms contribute to the WHO’s current estimate that more than half of all human diseases emanate from animals.⁸⁶

III. FACTORY FARMING AND THREATS IT PRESENTS TO THE HEALTH OF AMERICANS

Unhealthy farm conditions have contributed to disease safety problems in America.⁸⁷ In the United States, the scope of the problem of unsafe farming conditions has created antibiotic resistance and deadly disease outbreaks like H5N1. Not only are these outbreaks increasing in regularity, but they have the potential to spread like COVID-19.⁸⁸ If the health and safety of farm animals is not

⁸² Zoonotic Diseases, *supra* note 7.

⁸³ *Id.*

⁸⁴ Hollenbeck, *supra* note 7, at 45.

⁸⁵ *See infra* Part IV.

⁸⁶ *Of All Human Diseases, 60% Originate in animals—“One Health” Is The Only Way to Keep Antibiotics Working*, WHO (Nov. 12, 2018) <https://www.euro.who.int/en/health-topics/disease-prevention/food-safety/news/news/2018/11/of-all-human-diseases,-60-originate-in-animals-one-health-is-the-only-way-to-keep-antibiotics-working>.

⁸⁷ Stathopoulos, *supra* note 2, at 7.

⁸⁸ *See* C. Lee Ventola, *The Antibiotic Resistance Crises*, PHARMACY & THERAPEUTICS 280 (2015) (“Antibiotic-resistant infections are already widespread in the U.S. and across the globe. A 2011 national survey of infectious-disease specialists, conducted by the IDSA Emerging Infections Network, found that more than 60% of participants had seen a pan-resistant, untreatable bacterial infection within the prior year. Many public health organizations have described the rapid emergence of resistant bacteria as a “crisis” or “nightmare scenario” that could have “catastrophic consequences.”); *see also* Wiebers & Feigin, *supra* note 8, at 2 (“Over the last 40 years, as the factory farm model has become a global

regulated, specifically how many animals are allowed to be kept in close quarters with one another, then diseases transport from farms to human workers then to communities, or diseases transport from animal meat to humans.⁸⁹

Scientists warn that in the United States factory farming is creating a breeding ground for antibiotic resistance and super-viruses that threaten the safety and wellbeing of all people.⁹⁰ There is a dangerous potential for infectious diseases to spread from animals to factory workers and, finally, to the general public because zoonotic epidemics are created on factory farms; rampant diseases mutate as they spread through the CAFOs where animals are tightly confined and they jump from the animals to the human workers who spread it through communities.⁹¹ The size of the issue and the lack of any federal or state laws regulating factory farm conditions emphasizes why the USDA needs to use the broad authority given by the AHPA to step up and regulate the industry.⁹² The health of the world is at stake.

phenomenon, a host of avian influenza (bird flu) viruses, including H5N1, have emerged in countries with large-scale industrial poultry operations.”).

⁸⁹ See Jay P. Graham et al., *The Animal-Human Interface and Infectious Disease In Industrial Food Animal Production: Rethinking Biosecurity and Biocontainment*, PUB. HEALTH REP. 284 (2008), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2289982/pdf/phr123000282.pdf> (“[I]t is not surprising that increased risks of pathogen exposure and infections, both bacterial and viral, have been reported among farmers, their families, and farm workers at poultry and swine operations.”).

⁹⁰ Ventola, *supra* note 88 (“Many public health organizations have described the rapid emergence of resistant bacteria as a “crisis” or “nightmare scenario” that could have “catastrophic consequences.”).

⁹¹ *Id.* at 282–284 (“An analysis of data from the Thai government investigation in 2004 indicates that the odds of H5N1 outbreaks and infections were significantly higher in large-scale commercial poultry operations as compared with backyard flocks.” Additionally, “increased risks of pathogen exposure and infections, both bacterial and viral, have been reported among farmers, their families, and farm workers at poultry and swine operations.”).

⁹² See *infra* Part IV.

A. *Downed Animals*

Downed animals, called “downers” are a reality in CAFOs that present both human and food-safety issues.⁹³ When animals fall because they are sick or injured, they are often left where they have fallen without water, food, or medical care and then dragged to the slaughterhouse where they are processed for human consumption. Currently, there is a federal ban on the slaughter of downed cattle on a farm for human consumption, but there are no federal laws that govern the treatment of downed animals at the market or during transport to slaughterhouses, and the federal law only applies to cattle not pigs or any other type of downed animal.⁹⁴ As a result, a loophole still exists for consuming downed cattle because if a cattle is downed while in transport to a slaughtering facility, then it can still be consumed by humans.⁹⁵

One consequence of unsafe CAFOs and downed animals is they often die from infectious diseases and if the contaminated meat is consumed, it can result in human diseases.⁹⁶ Eating diseased meat can make humans sick. One example of a cow disease that causes cattle to be downed, and harms humans if consumed, is Bovine Spongiform Encephalopathy (“BSE”), otherwise known as mad cow disease.⁹⁷ BSE is a “direct consequence of industrial

⁹³ Kevin Briley, Note, *Downed Animals: Can Your Steak Stand Up For Itself?*, 15 SAN JOAQUIN AGRIC. L. REV. 39–40, (2006).

⁹⁴ The federal law governing transport only limits the length of time that an animal may be transported before food, water, and rest must be provided. The law does not address any other transport-related conditions like downed animals. See 49 U.S.C. § 80502 (1994) (limiting transport to no more than “28 consecutive hours without unloading the animals for feeding, water, and rest”); see also Ante-Morten Inspection, 9 C.F.R. § 309 (2012).

⁹⁵ See 49 U.S.C. § 80502 (1994).

⁹⁶ Robert Roos, *Senate Wants to Keep Downed Cattle Out of Food Supply*, CIDRAP (Nov. 10, 2003), <https://www.cidrap.umn.edu/news-perspective/2003/11/senate-wants-keep-downed-cattle-out-food-supply> (“Many of these animals are dying from infectious diseases and present a significant pathway for the spread of disease[.]”).

⁹⁷ *About BSE*, CTR. FOR DISEASE CONTROL, <https://www.cdc.gov/prions/bse/about.html> (last reviewed Oct. 18, 2021); See *Bovine Spongiform Encephalopathy (BSE)*, U.S. DEP’T OF AGRIC., <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/nvap/NVAP-Reference-Guide/Control-and-Eradication/Bovine-Spongiform-Encephalopathy> (last reviewed Nov. 18, 2021) (“BSE was first

agriculture,” because ground up animal parts were systematically fed to cows as part of a dietary protein supplement, and, as a result, a new deadly cow disease and a new deadly untreatable human disease called Creutzfeldt-Jakob (“vCJD”) was created.⁹⁸

Following a 2003 outbreak of BSE in the United States, there have been at least six other identified cases of BSE, and twenty-six cases in North America.⁹⁹ It is unclear how many cases have been unidentified, because there is no reliable way to test for BSE while a cow is alive.¹⁰⁰ Moreover, the nature of the infectious agent that causes BSE remains unknown.¹⁰¹ The most commonly accepted theory is that the agent is a modified form of a normal cell protein known as a prion.¹⁰² A prion is not a bacteria, parasite, or virus, so its exact nature is unknown.¹⁰³ Concerningly, when humans digest a cow that died because of BSE, they can get sick with vCJD and,

diagnosed in 1986 in Great Britain. Since then, more than 185,000 cases have been confirmed worldwide.”).

⁹⁸ *Mad Cow Disease*, BEYOND FACTORY FARMING, <http://www.beyondfactoryfarming.org/get-informed/health/mad-cow-disease-bse> (last visited Oct. 14, 2021); see Robert Roos, *supra* note 96 (“Eating meat products from BSE-infected cattle is believed to be the cause of variant Creutzfeldt-Jakob disease in humans.”).

⁹⁹ *BSE In North America*, CTR. FOR DISEASE CONTROL, <https://www.cdc.gov/prions/bse/bse-north-america.html> (last reviewed Sept. 10, 2021).

¹⁰⁰ See *Bovine Spongiform Encephalopathy*, *supra* note 97 (with limited factory farm regulations and no reliable way to test for BSE, it is unclear how many cows had BSE that were never identified or reported by the farmers and might have been sold to the general public for consumption); see also *All About BSE (Mad Cow Disease)*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/animal-veterinary/animal-health-literacy/all-about-bse-mad-cow-disease> (last updated July 23, 2020) (“Currently, there is no reliable way to test for BSE in a live cow. After a cow dies, scientists can tell if it had BSE by looking at its brain tissue under a microscope and seeing the spongy appearance.”).

¹⁰¹ *Bovine Spongiform Encephalopathy (BSE) Questions and Answers*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/vaccines-blood-biologics/safety-availability-biologics/bovine-spongiform-encephalopathy-bse-questions-and-answers> (last updated Mar. 23, 2018); see also *All About BSE*, *supra* note 100 (“For reasons that are not completely understood, the normal prion protein changes into an abnormal prion protein that is harmful.”).

¹⁰² *All About BSE*, *supra* note 100.

¹⁰³ *Id.* (Moreover it is unusual that, “[i]n cattle naturally infected with BSE, the BSE agent has been found in brain tissue, in the spinal cord, and in the retina of the eye . . . small intestine, tonsil, bone marrow, and dorsal root ganglia (lying along the vertebral column).”).

as of 2019, the 232 people known to have become sick with vCJD all died.¹⁰⁴

The uncommon nature of BSE means that common treatments used for bacterial infections or viruses are not effective.¹⁰⁵ The CDC believes that there is strong evidence that a new human prion disease variant called vCJD occurred after the BSE outbreak in cattle.¹⁰⁶ The CDC has on its website that “[t]he interval between the most likely period for the initial extended exposure of the population to potentially BSE-contaminated food (1984 to 1986) and the onset of initial vCJD cases (1994 to 1996) is consistent with known incubation periods for the human forms of prion disease”—as a result, if there is a substantial BSE outbreak in humans, there is no cure for vCJD because antibiotics and vaccines do not work against it.¹⁰⁷

Federal laws only protect humans from downed cattle, not any other type of animal, which means humans can consume diseased chickens and pigs that become incapacitated on farms with diseases.¹⁰⁸ For example, various diseases can pass from pigs to humans when infected meat is consumed: ringworm, erysipelas, leptospirosis, streptococcosis, campylobacteriosis, salmonellosis, cryptosporidiosis, giardiasis, balantidiasis, influenza, infection with pathogenic *E. coli*, and brucellosis.¹⁰⁹ Because of the disease transmitting capabilities of livestock on CAFOs, Congress needs to pass laws which regulate the unsafe conditions of these industrial operations. If the USDA is not going to act under the authority of the AHPA, then Congress needs to pass more laws which provide guidance for the USDA.

B. *Antibiotics in Meat*

CAFOs are also dangerous to humans because there can be antibiotic residue in their animal products.¹¹⁰ CAFOs use antibiotics

¹⁰⁴ BSE In North America, *supra* note 99.

¹⁰⁵ *Bovine Spongiform Encephalopathy*, *supra* note 97 (“There is not treatment or vaccine to prevent BSE.”).

¹⁰⁶ About BSE, *supra* note 97.

¹⁰⁷ *Id.*

¹⁰⁸ See Ante-Mortem Inspection, 9 C.F.R. § 309 (2012).

¹⁰⁹ *Zoonoses Associated With Swine*, WASHINGTON STATE UNIVERSITY (Jan. 2021), <https://iacuc.wsu.edu/zoonoses-associated-with-swine/>.

¹¹⁰ See Takele Beyene, *Veterinary Drug Residues in Food-animal Products: Its Risk Factors and Partial Effects*, J. VETERINARY SCI. TECHNOL 1 (Dec. 11,

to treat and prevent the livestock diseases which are created from their unsanitary conditions.¹¹¹ Antibiotics in animal products can have a direct impact on human health because they contribute to antibiotic resistance.¹¹² On an individual level, antibiotic resistance means that antibiotics will not work on individuals because they have been over-exposed to them and, on a large scale, overuse of antibiotics creates super diseases which are resistant to antibiotics. Notably, “[t]he major health significances of drug residue are development of antimicrobial drug resistance, hypersensitivity reaction, carcinogenicity, mutagenicity, teratogenicity, and disruption of intestinal normal flora.”¹¹³

In America, drug residue is found in almost every animal product sold to American consumers: turkey, pork, beef, and poultry.¹¹⁴ In 2018, the WHO recommended that “farmers and the food industry stop using antibiotics in healthy animals,” but the USDA has ignored this.¹¹⁵ Since 2009, the intensity and amount of antibiotics consumed in human medicine within the United States has decreased because there is widespread fears in hospitals of antibiotic

2015) (“The use of veterinary drugs in food-producing animals has the potential to generate residues in animal derived products and poses a health hazard to the consumer.”).

¹¹¹ See Julia R. Barrett, *Airborne Bacteria in CAFOs: Transfer of Resistance from Animals to Humans*, ENVIRON HEALTH PERSPECT., 116, 116 (Feb. 2005).

¹¹² See Ronald Ngom, *Human Health Risks Related to Penicillin G and Oxytetracycline Residues Intake Through Beef Consumption and Consumer Knowledge About Drug Residues in Maroua, Far North of Cameroon*, 7 FRONTIERS IN VETERINARY SCIENCE 5 (2020), <https://www.frontiersin.org/articles/10.3389/fvets.2020.00478/full> (“[T]he rate of antibiotic residue consumption estimated could affect the health of consumers. Indeed, several studies have shown that intake of PEN (penicillin) residues can cause allergic reactions, hypersensitivity, and anaphylactic reactions in sensitive consumers. This is important, given that ~5–10% of the population worldwide is hypersensitive to PEN.”).

¹¹³ Beyene, *supra* note 110, at 1.

¹¹⁴ See NRDC, ANTIBIOTIC CONSUMPTION IN U.S. PORK, BEEF, AND TURKEY INDUSTRIES VASTLY OUTSTRIPS COMPARABLE INDUSTRIES IN EUROPE, AND THE U.S. CHICKEN INDUSTRY 2 (2018), <https://www.nrdc.org/sites/default/files/antibiotic-consumption-us-pork-beef-and-turkey-industries-ib.pdf> (“The conventional turkey, pig, and cattle industries in the United States consume medically important antibiotics much more intensively than . . . their counterpart European industries, as well.”) [hereinafter ANTIBIOTIC CONSUMPTION IN U.S.].

¹¹⁵ *Id.* at 1 (citations omitted).

resistance.¹¹⁶ However, most Americans are not aware that all uses of antibiotics contributes to the spread of antibiotic resistance including use in human medicine and raising animals.¹¹⁷ A common practice on CAFOs, is long-term, low-level dosing of antibiotics which creates an appropriate environment for bacteria to develop antibiotic resistance.¹¹⁸

In the United States, the largest product of factory farms is poultry, and about twenty-eight chickens per American were kept in CAFOs in 2019—9.3 billion chickens total.¹¹⁹ Pumped full of antibiotics, the chicken industry contributes to antibiotic resistance.¹²⁰ According to the FDA in their “2016 Summary Report on Antimicrobials,” chicken production consumed 508,500 kilograms of antibiotics per livestock, which humans then consumed small quantities of in their meat.¹²¹

Producers of turkey, pork, and beef are feeding Americans even more kilograms of antibiotics.¹²² In fact, beef production consumed 3,610,943 kilograms of medically important antibiotics, followed by 3,133,262 kilograms in pig production, and 756,620 kilograms in turkey production.¹²³ The turkey industry by far had the highest percentage of antibiotics per animal, with 474 milligrams of antibiotic per kilogram of turkey.¹²⁴ The high levels of antibiotic used on CAFOs leads to antibiotic resistance in humans.¹²⁵ Because antibiotics become less effective the more they are used, it is necessary that lifesaving drugs be used judiciously in every setting.¹²⁶

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ Barrett, *supra*, note 111.

¹¹⁹ Kristof, *supra* note, 80.

¹²⁰ See ANTIBIOTIC CONSUMPTION IN U.S., *supra* note 114, at 2; see also Ngom, *supra* note 112, at 5 (“Indeed, infections caused by resistant bacteria result in longer duration of illness, higher mortality rates, and increased costs associated with alternative treatment. Current projections suggest that antimicrobial resistance will cause ≈300 million premature deaths by the year 2050.”).

¹²¹ ANTIBIOTIC CONSUMPTION IN U.S., *supra* note 114, at 2.

¹²² *Id.* at 2.

¹²³ *Id.* at 3.

¹²⁴ *Id.*

¹²⁵ Barrett, *supra* note, 111.

¹²⁶ David Hyun & Helene Sherburne, *FDA Will Require Veterinary Oversight for All Animal Antibiotics Important to Human Medicine*, PEW, (July 22, 2021), <https://www.pewtrusts.org/en/research-and-analysis/articles/2021/07/13/fda->

The FDA is supposed to regulate antibiotics in meat, but the overuse of antibiotics has run rampant in the United States because up until June 10, 2021, producers were allowed to purchase over-the-counter antibiotics without a prescription.¹²⁷ The new policy known as Guidance for Industry #263, requires veterinary oversight over all medically important antibiotics.¹²⁸ Strict enforcement of this new policy will be necessary to ensure that the hundreds of thousands of CAFOs in the United States do not continue to cause antibiotic resistance in humans. The USDA is responsible for performing residue tests at slaughtering, but the FDA is the primary agency that regulates antibiotic use in animals.¹²⁹

Currently, the CDC reports that “[a]ny time antibiotics are used, in people and animals, they can contribute to the development of antibiotic resistance. Antibiotic use in food animals can help treat bacterial diseases in animals. However, to slow the spread of antibiotic resistance, antibiotics should only be used when necessary.”¹³⁰ Judicious use of antibiotics in people and animals is necessary to slow the spread of antibiotic resistance, and the FDA and USDA are improving antibiotic use in animals.¹³¹ However, the US Government Accountability Office has been calling on the FDA and USDA to collect more comprehensive data from livestock producers for years, but the agencies have not complied.¹³² The USDA has

will-require-veterinary-oversight-for-all-animal-antibiotics-important-to-human-medicine.

¹²⁷ *Id.*

¹²⁸ RECOMMENDATIONS FOR SPONSORS OF MEDICALLY IMPORTANT ANTIMICROBIAL DRUGS APPROVED FOR USE IN ANIMALS TO VOLUNTARILY BRING UNDER VETERINARY OVERSIGHT ALL PRODUCTS THAT CONTINUE TO BE AVAILABLE OVER-THE-COUNTER, FDA, (June 2021), <https://www.fda.gov/media/130610/download>.

¹²⁹ *Antimicrobial Resistance Action Plan*, USDA 3 (June 2014), <https://www.usda.gov/sites/default/files/documents/usda-antimicrobial-resistance-action-plan.pdf>.

¹³⁰ *Antibiotic/ Antimicrobial Resistance (AR/AMR)*, CTR. FOR DISEASE CONTROL, <https://www.cdc.gov/drugresistance/food.html> (last reviewed Nov. 19, 2020).

¹³¹ *Id.*

¹³² See Chris Dall, *Report Slams Beef Industry For Overuse of Antibiotics*, CIDRAP (June 26, 2020), <https://www.cidrap.umn.edu/news-perspective/2020/06/report-slams-beef-industry-overuse-antibiotics> (“The US meat industry has spent its time arguing that currently collected data on antibiotic sales is not useful,

deferred action to the FDA but under the AHPA, the USDA has broad authority to regulate for diseases in livestock, because the overuse of antibiotics causes diseases in animals and humans to become untreatable, the USDA likely has the authority and should exercise it to assist the FDA in stopping the rampant problem of antibiotic overuse on CAFOs.¹³³

Other studies on antibiotics in animals have discovered how truly dire the problem is in America:

Researchers at the Johns Hopkins Bloomberg School of Public Health drove cars . . . behind trucks that were transporting broiler chickens from farms to slaughterhouses in Virginia and Maryland; they documented antibiotic-resistant bacteria in the air inside the cars, as well as on the top of soda cans in the cars' cupholders.¹³⁴

Americans consume antibiotics in their chicken, which leads to antibiotic resistance in humans.¹³⁵

According to the CDC, more than 2.8 million people suffer from antibiotic-resistant infections each year.¹³⁶ The CDC also estimates that more than 35,000 Americans die from these antibiotic-resistant infections.¹³⁷ Moreover, the CDC has confirmed that there is a definitive link between the common use of antibiotics in farm animals and the emerging and fast-growing problem of antibiotic-resistant

yet they have not helped find amenable solutions.”); *see also* Antimicrobial Resistance Action Plan, *supra* note, 125 (the USDA has not updated its action plan since 2014).

¹³³ 7 U.S.C. § 8308 (2012).

¹³⁴ Wiebers & Feigin, *supra* note 8, at 2–3.

¹³⁵ *See* ANTIBIOTIC CONSUMPTION IN U.S., *supra* note 114, at 2 (“At 242.8 mg of antibiotic/kg of livestock, the figure for U.S. livestock production is 95 percent greater than the combined figure (124.6 mg of antibiotic/ kg of livestock) for the 30 European countries.”).

¹³⁶ Trisha Calvo & Rachel Meltzer-Warren, *What ‘No Antibiotics’ Claims Really Mean: Was That Meat or Poultry Raised With Drugs? The Truth Behind Those Labels*, CONSUMER REP. (Sept. 10, 2020), <https://www.consumerreports.org/overuse-of-antibiotics/what-no-antibiotic-claims-really-mean/>.

¹³⁷ *Inhumane Practices on Factory Farms*, ANIMAL WELFARE INST., <https://awionline.org/content/inhumane-practices-factory-farms> (last visited Jan. 5, 2021).

bacteria.¹³⁸ If large amounts of antibiotics keep being used in CAFOs, tuberculosis, gonorrhea, typhoid, syphilis, diphtheria, and meningitis will likely become fatal to humans because individuals are resistant, and the diseases will mutate to become resistant.¹³⁹

C. *Antibiotics Dumps*

Antibiotics are not only found in the meat of animals produced on CAFOs, but also high concentrations of antibiotics are found in CAFO manure. Forty-five percent of chickens are produced in only four states: Arkansas, North Carolina, Georgia, and Alabama.¹⁴⁰ States with CAFOs have high concentration of areas with antibiotic resistant bacteria, as thirty to eighty percent of antibiotics given to animals are excreted in manure and urine, which then gets into human water.¹⁴¹ Scientists have postulated that, “poultry litter-amended soil may serve as a non-point source for antibiotics that enter surface and ground waters via runoff and leaching.”¹⁴² There is evidence of transmission of antibiotics from chicken manure to soil, water, and plants, which then spread to humans.¹⁴³ Also, there is a transmission chain between antibiotics, chickens, poultry products, and humans.¹⁴⁴ A new sequencing of genes has uncovered that in every gram of chicken feces, there is up to 10^{23} copies of an antibacterial resistant pathogen being released into the environment every day.¹⁴⁵ “Soils receiving poultry litter may be a major reservoir and transmission route” for antibiotic resistant bacterial genes.¹⁴⁶ Nevertheless, this study, which was funded by the USDA, reasons that the pathway of this antibiotic-resistant material through the

¹³⁸ *Id.*

¹³⁹ Mike Turner, *Antibiotic Resistance: 6 Diseases That May Come Back to Haunt Us*, GUARDIAN (May 9, 2014), <https://www.theguardian.com/commentis-free/2014/may/09/6-diseases-becoming-resistant-to-antibiotics>.

¹⁴⁰ Yichao Yang et al., *Review of Antibiotic Resistance, Ecology, Dissemination, and Mitigation in U.S. Broiler Poultry Systems*, FRONTIERS IN MICROBIOLOGY 2 (2019) (discussing the U.S. states where most chickens are produced).

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ *Id.* at 3.

¹⁴⁴ *Id.*

¹⁴⁵ *Id.* at 4.

¹⁴⁶ *Id.* at 6.

environment is “complicated” and “more research is needed” to understand it.¹⁴⁷ Additionally, monitoring of land water will be critical, even though it is clear from the study that CAFOs have high concentration of antibiotic resistance excrement which is polluting human water sources.¹⁴⁸ The four American states primarily responsible for poultry, create dumps of chicken waste, which are sources of antibacterial resistance.¹⁴⁹

D. *Organic Labels . . . Misleading and Not Enforced*

Consumers look to USDA labels to see if their meat contains antibiotics, however, the labels contribute to the problem rather than solve it. In 2020, a study of American adults found “that 50% of the respondents thought meat products with ‘antibiotic-free’ and ‘hormone-free’ labels were healthier than other products not labeled.”¹⁵⁰ The USDA has certified labels for products that state “organic,” which is supposed to mean that the animal did not receive antibiotics.¹⁵¹

There are two problems with organic labels, these labels don’t mean what we think they mean, and the rules are not enforced. First, the organic labels are misleading, even though the USDA claims meat is antibiotic free, “[c]hickens and turkeys can be given antibiotics in the hatchery while the chick is still in the egg and on its first day of life” and still meet the requirements to be labelled

¹⁴⁷ *Id.* at 7.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* at 4 (Since antibiotic resistance genes can be transferred from manure to soil and “antibiotics migrate from soil through runoff,” the four states where most poultry are produced are most likely home to high intensity areas of antibiotic resistance and pollution); Hayden Hedman et al., *A Review of Antimicrobial Resistance in Poultry Farming within Low-Resource Settings*, ANIMALS 2 (Jul. 24, 2020), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7460429/pdf/animals-10-01264.pdf>. (“Promotion of intensive poultry production could increase antimicrobial resistance (AMR).” Also, “intensively raised poultry can function as animal reservoirs for AMR.”).

¹⁵⁰ Lindsey Newman, *Consumer Perception of Antibiotic-Free and Hormone-Free Meat Products*, J. FOOD STUDIES 81 (2020), https://www.researchgate.net/publication/344735905_Consumer_Perception_of_Antibiotic-Free_and_Hormone-free_Meat_Products.

¹⁵¹ Miles McEvoy, *Organic 101: What the USDA Organic Label Means*, USDA (Mar. 13, 2019), <https://www.usda.gov/media/blog/2012/03/22/organic-101-what-usda-organic-label-means>.

“organic.”¹⁵² Similarly, the label “no medically important antibiotics” is misleading because *any* antibiotic use can lead to antibiotic resistance in humans and the creation of antibiotic resistance bacteria.¹⁵³ Second, “raised without antibiotics” is supposed to mean that the USDA has confirmed no antibiotics were used, however, the industry is left to police itself.¹⁵⁴ Producers send documentation to the USDA to support their claims, but the USDA does not confirm the reports with any investigations.¹⁵⁵ Overall, the USDA’s meat labels about antibiotics mislead consumers.¹⁵⁶

CAFOs pose a threat to human health through the creation of infectious diseases, BSE spread, and antibiotic resistance.¹⁵⁷ This threat needs to be addressed and rectified. The UK government commissioned a review on antimicrobial resistance and found that without action the number of humans who could die yearly because of antibiotic resistance could grow to ten million by the year 2050.¹⁵⁸

IV. USDA AND CONGRESS POLICY ON CAFOs NEEDS TO CHANGE

CAFOs can be reformed to prevent the spread of infectious diseases to humans through the regulation of the USDA’s policies and the creation of new laws. On the USDA’s website they state their policy concerning CAFO’s—“USDA’s goal is for CAFO owners and operators to take voluntary actions to minimize potential air and water pollutants from storage facilities, confinement areas, and land application areas.”¹⁵⁹ The USDA’s policy talks generally about CAFO pollution, but the agency has not set forth any strategic plan

¹⁵² Calvo & Warren, *supra* note 136.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ See part III.

¹⁵⁸ *Antimicrobial Resistance: Tackling a Crisis For the Health and Wealth of Nations*, Review on Antimicrobial Resistance, Chaired by Jim O’Neill, 5 (Dec 2014) https://amr-review.org/sites/default/files/AMR%20Review%20Paper%20-%20Tackling%20a%20crisis%20for%20the%20health%20and%20wealth%20of%20nations_1.pdf.

¹⁵⁹ *Animal Feeding Operations*, USDA, <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/livestock/afo/> (last visited Nov. 13, 2021).

for preventing or minimizing the spread of infectious diseases. The USDA's general policy encourages CAFOs to police themselves through voluntary action, and the USDA offers to provide technical and financial assistance through the National Resource Conservation Service ("NRCS").¹⁶⁰ Congress has passed the AHPA to address infectious disease spread on CAFOs, and the USDA needs to use its broad mandate to promote policies of de-intensification and more sanitary animal conditions.¹⁶¹

First, if the USDA promotes policies of de-intensification of the livestock industry these efforts would go a long way towards helping reduce the pandemic risk from factory farming.¹⁶² Overcrowding and unsanitary conditions in factory farms present the two biggest risks that could be effectively changed through policies that limit the number of livestock allowed on factory farms.¹⁶³ One example, is the USDA could act under the authority of the AHPA and mandate a cap on the number of livestock allowed to be held on one CAFO. Another policy that would help with de-intensification, is the USDA could mandate that the "organic" label rules apply to *all* CAFOs. One of the organic rules is that "[a]ll organic livestock and poultry are required to have access to the outdoors year-round."¹⁶⁴ If this standard was adopted for all livestock on CAFOs, then producers would be forced to de-intensify to provide sufficient outdoor space for their animals. The USDA needs to shift its policies to fill the regulatory hole by policing farm animal conditions to prevent pandemics and expand its organic policies to all CAFOs.

Second, the USDA needs to promote policies of vaccination and protection of CAFO workers to stop the spread of infectious diseases from livestock to workers. If de-intensification occurs, then less factory workers will be necessary, which will lessen the threat of disease spread. As a baseline, all CAFO workers need to be trained to

¹⁶⁰ *Id.* ("NRCS can help landowners achieve this goal by providing technical and in many cases financial assistance, for the adoption of practices that will protect our natural resources.").

¹⁶¹ 7 U.S.C. § 8308(a).

¹⁶² *Id.*

¹⁶³ See *Surge in Diseases of Animal Origin Necessitates New Approach to Health-Report*, FOOD AND AGRIC. ORG. OF THE UNITED NATIONS (Dec. 16, 2013), <https://www.fao.org/news/story/en/item/210621/icode/>; Samuel, *supra* note, 67.

¹⁶⁴ *About the Organic Standard*, USDA, <https://www.ams.usda.gov/grades-standards/organic-standards> (last visited Nov. 18, 2021).

observe, identify, and treat infected animals.¹⁶⁵ Additionally, studies have found that vaccination of CAFO workers would effectively prevent diseases from spreading.¹⁶⁶ The USDA needs to pass regulations that mandate CAFO workers are up to date on relevant vaccines because they are the first point of contact between zoonotic diseases.

Finally, legislation is another avenue to achieve this de-intensification. Senator Cory Booker has proposed legislation that would phase out factory farms by 2040.¹⁶⁷ Booker said in a statement, “[o]ur food system was not broken by the pandemic and it was not broken by independent family farmers, . . . [i]t was broken by large, multinational corporations like Tyson . . . because of . . . buying power and size, have undue influence over the marketplace and over public policy.”¹⁶⁸

Big picture, the most effective way to prevent against the CAFO pandemic threat, is for the USDA to invest more in plant-based agriculture to grow crops to feed humans, rather than raising livestock, to reduce the threat of infectious diseases and antibiotic resistance.¹⁶⁹ Positively, the USDA does seem to be shifting its energy towards de-intensification because on October 12, 2021, the USDA announced it would be investing more than \$146 million into sustainable agricultural research made through the National Institute of Food and Agriculture (“NIFA”) Sustainable Agriculture Systems program.¹⁷⁰ Currently, there are over 25,000 CAFOs in the United States, and action needs to be taken to de-intensify farms, protect workers, and shift resources towards sustainable research.¹⁷¹

¹⁶⁵ Hollenbeck, *supra* note 7, at 45.

¹⁶⁶ Saenz, *supra* note 6, at 3.

¹⁶⁷ J. Edward Moreno, *Booker Renews Push to Phase Out Factory Farming By 2040 After Pandemic Hits Meatpacking Plants*, HILL, (May 7, 2020), <https://thehill.com/homenews/senate/496661-booker-renews-push-to-phase-out-factory-farming-by-2040-after-pandemic-hits>.

¹⁶⁸ *Id.*

¹⁶⁹ See Wiebers & Feigin, *supra* note 8, at 3.

¹⁷⁰ *USDA Announces More Than \$146M Investment in Sustainable Agricultural Research*, USDA (Oct. 6, 2021), <https://www.usda.gov/media/press-releases/2021/10/06/usda-announces-more-146m-investment-sustainable-agricultural>.

¹⁷¹ FACTORY FARM NATION, *supra* note 14, at 1 (as of 2020, there are estimated to be about 25,000 factory farms in the U.S.).

V. CONCLUSION

Antibiotics are present in American meat at higher amounts than the combined levels of thirty European countries.¹⁷² The United States provides an example to the rest of the world and the President alongside Congress, need to address CAFOs and their infectious public health threats.¹⁷³ The USDA needs to shift its energies from animal agriculture and protecting CAFOs, towards the de-centralization of farming, protection of workers, and plant-based agriculture.¹⁷⁴ We need to stop treating nature and community, so full of all we need to survive, as just another competitor to be run off by the market.¹⁷⁵ We need to respect our food and in doing so we will preserve the health of humans.

Many scientists are stating clearly that the “most significant change in the evolution of the influenza virus is the rapid growth of the CAFOs on a global scale.”¹⁷⁶ Scientists are explicitly warning that CAFO’s are creating new emerging infectious diseases because their overcrowded and unsanitary conditions create the perfect host environment that modifies genetic traits to make new deadly diseases.¹⁷⁷ COVID-19 has shown us what our future will look like if America continues to not regulate CAFOs and ignore how they are breeding grounds of infectious diseases.¹⁷⁸ As one scientists put it, CAFO’s “are the most likely epicenter of the next pandemic.”¹⁷⁹

¹⁷² Antibiotic Consumption, *supra* note 114; *See* discussion *supra* Part III.

¹⁷³ *See* discussion *supra* Part II, III.

¹⁷⁴ *See* discussion *supra* Part IV.

¹⁷⁵ *See* discussion *supra* Part II-IV.

¹⁷⁶ Hollenbeck, *supra* note 7, at 44.

¹⁷⁷ *Id.*

¹⁷⁸ *See* discussion *supra* Part II.

¹⁷⁹ Hollenbeck, *supra* note 7, at 44.