THE MEAT INDUSTRY: A LINK BETWEEN GLOBAL PANDEMICS, CLIMATE CHANGE, AND ECONOMIC CRISIS

ARTICLE

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Introduction

The consumption of meat began as a necessary means to an end, the survival of humankind. "The earliest clear evidence of [*Hominin*] cooking food dates back roughly 800,000 years ago, although it could have begun sooner" and "[o]nce humans shifted to even occasional meat eating, it didn't take long . . . [before it became] a major part of our diet."[1] However, as time has gone by, it has developed into more than a necessity, rather it is a symbol of health, strength, power, wealth, and even masculinity. Today, meat has a pivotal role in the lives of most Americans who individually consume an average of 54.5 pounds yearly,[2] and fuel a massive and powerful industry that generates an average annual gross income of 88.7 billion dollars.[3] The meat industry is considered so essential in our daily lives and society as a whole, that the United States (hereinafter, "U.S.") government spends 38 billion dollars a year alone on subsidizing it, while only spending 17 million subsidizing industries related to fruits and vegetables.[4]

But what is truly our relationship with meat? Why is meat so important to us that we are willing to overlook the risks and life-threatening dangers that accompany its production and consumption? Why is the government taking such a light-handed approach in regulating this industry despite the health risks for consumers and employees, the severe environmental damage, and the human rights violations reported in meatpacking and processing facilities? Why is it difficult for the government to

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1 *Dave Roos, The Juicy History of Humans Eating Meat,* History *(May 8, 2019),* https://www.history.com/news/why-humans-eat-meat.

2 *How much beef is consumed per person in the United States?*, USDA (July 17, 2019), https://ask.usda.gov/s/article/How-much-beef-is-consumed-per-person-in-the-US.

3 U.S.D.A., Meat Animals Production Disposition, and Income 2019 Summary 5 (Apr. 2020), https://downloads.usda.library.cornell.edu/usda-esmis/files/02870v85d/6m3127982/x920gh39g/meatan20.pdf.

4 Marta Zaraska, *Hooked on Meat: How Cultural Beliefs and Attitudes Drive Meat Consumption*, MEATONOMIC$: The Bizarre Economics of Meat and Dairy (Apr. 20, 2016), https://meatonomics.com/2016/04/20/hooked-on-meat-how-cultural-beliefs-and-attitudes-drive-meat-consumption/.

encourage a slow and steady transition to alternative solutions or an overall reduction in this industry?

This paper explores humanity's initial relationship with meat and how that has ultimately developed into deep patterns of consumer dependency. It will also go over how the U.S. government's subsidy policy plays an essential role in maintaining this industry while refusing to regulate its environmental footprint on the planet. Furthermore, it will highlight and analyze the detrimental effect of the meat industry on the environment, the economy, and human health. These dangers will not cease unless we, as a society, decrease our daily consumption of meat and seek alternate solutions. Also, the paper will explore the misconception between the consumption of meat for a healthy lifestyle and the actual health risks its consumption entails, such as risks of cardiovascular disease, diabetes, some forms of cancer, and premature death.[5] Another concerning threat to human life includes the risk of zoonotic diseases —diseases that can be transmitted from animals to humans and from humans to animals—such as leptospirosis, cryptosporidiosis, giardiasis, salmonellosis, and tuberculosis.[6] "Emerging zoonoses are responsible for some of the most high profile and devastating epidemics."[7] This is no small threat, the most recent global pandemic was the consequence of a deadly zoonotic disease, caused by a virus called COVID-19, which cost millions of lives, shook our collective social systems to the very core, and paralyzed the global economy.

It is important to note that the focus of this paper is not to turn its reader into veganism or vegetarianism, as other viable options will be explored as well, but rather to recognize a serious societal problem that needs to be addressed immediately for the well-being of the reader, and for future generations that will suffer the consequences of our inaction as well.

I. The Power Of The Meat Industry

A. Meat and society

Throughout history, humans have demonstrated time and time again their capacity to adapt to harsh conditions and prevailing necessities. From hunting and cultivating food to genetic modification of plants and animals, the ingenious of humankind has permitted its survival at its most vulnerable moments.[8] However, centuries have gone by and in many parts of the world today we no longer find ourselves in the same situation. Instead of striving to achieve a daily supply of food intake that would provide enough nourishment for our survival, we lavish on excess. In developed countries such as the U.S., food is often

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5 *Increasing red meat intake linked with heightened risk of early death: Swapping red meat for healthier animal or plant-based alternatives may lower risk*, Science Daily (June 12, 2019), https://www.sciencedaily.com/releases/2019/06/190612183633.htm.

6 Kevin D. Pelzer & Nancy Currin, *Zoonotic Diseases of Cattle*, Virginia Cooperative Extension 1 (2005).

7 Stephanie J. Salyer et al., *Prioritizing Zoonoses for Global Health Capacity Building—Themes from One Health Zoonotic Disease Workshops in 7 Countries*, 23 Emerging Infectious Diseases Journal S57 (2017).

8 Michael Eisen, *How GMOS Can Save Civilization (And Probably Already Have)*, Impossible Foods (Mar. 16, 2018), https://www.impossiblefoods.com/blog/how-gmos-can-save-civilization-and-probably-already-have.

produced and then thrown away because it goes unused.[9] "In the [U.S.], food waste is estimated at between thirty to forty percent of the food supply."[10] Just in 2010, "133 billion pounds and $161 billion worth of food [were thrown out. In fact,] [w]asted food is the single largest category of material placed in municipal landfills . . ."[11] This is not only a waste of the economic resources used in the production of food such as raw material, energy, water, and land, but it also damaging to the environment. "When food decomposes it produces methane, a greenhouse gas twenty-one times more potent than CO_2 [and] landfills generate 20 percent of all methane emissions."[12]

In the U.S., aliments such as meat are considered to be an essential part of every meal. It is customary for meat to be the main ingredient in a dish and then be accompanied by a complementary item, such as vegetables or carbohydrates. As an example, "[s]chool cafeterias serve [meat] . . . every day with a few plant-based offerings, raising expectations for a daily dose of [animal protein] . . ."[13] As such, the intrinsic value of meat is higher than that of other food items. The enhanced social value of meat is derived partly from the quality of nutrients it provides to the body when consumed. Some of nutrients that meat provides for us consist of:

> [H]igh quality protein, containing all essential amino acids and its highly bio available minerals and vitamins. [Also,] meat is rich in Vitamin B12 and iron, [supplements] which are not readily available in vegetarian diets. Underlying discussions of the nutrient value of meat is the idea that the human body has intrinsic nutritional needs which meat consumption helps to satisfy.[14]

Moreover, it is believed that the nutrients obtained by the consumption of meat played an important role in the evolution of the human brain. According to scientists "[b]y starting to eat [a] calorie-dense meat and marrow instead of the low-quality plant diet of apes, our direct ancestor, *Homo erectus*, took in enough extra energy at each meal to help fuel a bigger brain."[15] This means that the consumption of meat was critical in the evolution of humankind and a significant factor in the making of modern humans. Some experts have gone as far as to say that "meat is what made us human."[16] However, this is not the only source pertaining to the value and importance that society has given to this commodity. Its acquisition and consumption have played an important social role throughout history. "Consumption, [after all,] is the result of social, economic, technological, political, and

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9 *Food Loss and Waste*, FDA, https://www.fda.gov/food/consumers/food-loss-and-waste (last visited Jan. 5, 2022).

10 *Id.*

11 *Id.*

12 Steve Russell, *There's a Reason We Use Plastics to Package Food*, American Chemistry Council (Feb. 27, 2018), https://www.americanchemistry.com/chemistry-in-america/news-trends/blog-post/2018/there-s-a-reason-we-use-plastics-to-package-food/.

13 Moses Seenarine, Meat Climate Change: The 2nd Leading Cause of Global Warming 129 (2016).

14 Emily Yates-Doerr, *Meeting the demand for meat?*, 28 Anthropology Today 11, 12 (2012).

15 Ann Gibbons, *The Evolution of Diet*, National Geographic Magazine, http://www.nationalgeographic.com/foodfeatures/evolution-of-diet/ (last visited Jan. 6, 2022).

16 Roos, *supra* note 1 (*citing* Marta Zaraska, Meathooked: The History and Science of Out 2.5-Million-Years Obsession With Meat (2016)).

psychological forces."[17] In short, the consumption of meat also has deeply rooted social connotations.

Since early civilization, meat has been associated with power, health, and strength. Generally, meat is an indicator of economic success as "there's a clear correlation between wealth and meat consumption."[18] For example, foodies or food enthusiasts love to indulge in quality meat and are willing to pay a premium for what is considered a prime cut of beef.[19] Others opt for spending a considerable amount of money on purchasing what they consider to be quality meat to serve on festivities or special occasions. This is often done to influence their peer's perception related to that person's status and economic situation. For example, it is a tradition and often considered a necessary expenditure, to purchase a whole turkey in Thanksgiving for the family and guests. Another example are barbecue parties which are very famous in the United States during Fourth of July celebrations where people buy prime cuts of beefs and other meats and indulge with family, friends and neighbors. But how did meat go from being a simple item for sustenance to a high-priced item that can denote a person's social status?

"Psychologists [have] confirmed that meat eating is associated with attitudes that endorse hierarchical structures."[20] It is profoundly engrained in our lives that it even influences our societal roles. Meat, for instance, is often associated with masculinity, a characteristic that to this day continues to represent power, strength, and a higher place in hierarchy. In earlier times, men went out to hunt while women prepared the meals and cared for the children. This established a separation in gender roles and a distinct pattern of association between masculinity and the consumption of animals. During times of war and scarcity it was also customary for the man to be given the only meat available to the family as it was believed that this would provide him the strength needed in battle. "It has traditionally been felt that the working man needs meat for strength. A superstition operates in this belief: in eating the muscle of strong animals, we will become strong."[21] Consequently, it can be assumed that nowadays women are more likely to consume less meat and even to adhere to vegan or vegetarian lifestyles. According to the North American Meat Institute, "American men on average eat 4.8 ounces of meat per day [, while] . . . women eat 3.13 ounces of meat per day."[22]

The concept of meat as a source of vigor and power is so potent and runs so deep in our subconscious that even our language and ways of expression have associated meat-related concepts with strength while associating vegetable-related vocabulary with weakness. For example:

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17 Seenarine, *supra* note 13 at 127.

18 Roos, *supra* note 1.

19 Scott Brown, *Big test for Prime beef demand*, Farm Process (Aug. 3, 2020), https://www.farmprogress.com/beef/big-test-prime-beef-demand.

20 George Smith, *The mind of the meat eater – scientists delve into the psychology of carnism*, New Food (Sept. 26, 2017), https://www.newfoodmagazine.com/news/44552/mind-meat-eater/.

21 Carol J. Adams, The Sexual Politics of Meat: A Feminist-vegetarian critical theory 56 (2015).

22 The United States Meat Industry at a Glance, North American Meat Institute, https://www.meatinstitute.org/index.php?ht=d/sp/i/47465/pid/47465 (last visited Jan. 6, 2022).

> Meat represents *the essence or principal part of something*, according to the *American Heritage Dictionary*. Thus, we have [phrases like] the "meat of the matter," [or] "a meaty question." [Also,] to "beef up" something is to improve it. Vegetable, on the other hand, represents the least desirable characteristics: *suggesting or like a vegetable, as in passivity or dullness of existence*, *monotonous*, *inactive*. Meat is *something one enjoys or excels in*, vegetable becomes representative of someone who does not enjoy anything: *a person who leads a monotonous*, *passive*, *or merely physical existence*.
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> A complete reversal has occurred in the definition of the word vegetable. Whereas its original sense was to be *lively*, *active*, it is now viewed as dull, monotonous, passive. To vegetate is to lead a passive existence . . .[23]

It is then not difficult to understand the struggle that ensues for people and especially for men to reduce their daily meat intake. Social conditioning seems to pressure them into excessive and often unnecessary consumption and to consider "[e]ating animal-based meals [as] . . . a status symbol."[24]

Because of meat's idiosyncrasy, carnism or "the invisible belief system, or ideology, that conditions people to eat certain nonhuman animals or food animals",[25] manifests itself more significantly in the so-called middle class. As consumption plays a leading role in how a person is categorized by his or her peers, there is a clear trend of overconsumption by people who find themselves in this economic-based social category. "Overall, the clear trend globally is for rising animal consumption among the urban middle class."[26] Dr. Tamara Pfeiler, of JGU's Institute of Psychology, who specializes in investigating the psychology of carnism asserts that "[c]arnistic beliefs also seem to be associated with an attitude that approves of dominance within social structures."[27] This is a leading driver in consumption relating to people who often have no difficulty meeting their basic needs, yet wish they had a surplus of capital to spend on more lavish items. It is part of a societal pattern where the middle class, placed in the middle of the social hierarchy, defines itself by adhering to socially dominant expectations. Their choices are less driven by what they think is right, and more often by what they think others expect from them. As the global population continues to rise and the middle-class phenomena will emerge in developing countries, there will be an estimated 70 percent increase in carnism from now until the year 2050.[28]

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23 Adams, *supra* note 21, at 60.

24 Seenarine, *supra* note 13, at 129.

25 *Id.* at 4.

26 *Id.* at 129.

27 Smith, *supra* note 20.

28 Animal Health: A multifaceted challenge, World Organization for Animal Health 1, 18, https://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Key_Documents/ANIMAL-HEALTH-EN-FINAL.pdf (2015).

B. The economic power and impact of the meat industry on the U.S.

i. Overview of the meat industry in the U.S.

In general, Americans still consume more animal protein than the daily recommended amounts in the 2015-2020 Dietary Guidelines of the U.S. Department of Agriculture (hereinafter "U.S.D.A.").[29] This alarming pattern of consumption, global population growth, and the fact that "during the twenty-first century, global demand for meat, dairy, and poultry products increased by over one hundred percent, with another projected rise of seventy-three percent by 2050,"[30] requires a closer look at the economic influence that this industry holds. Only after such analysis, will it be possible to consider and apply a more sustainable consumption model that can encompass the overall current economic challenges and a national and global business reform of meat-related industries.

Because of its high demand, the meat industry is an important economic actor in the U.S. with the power to influence legislation and regulation. Statistics for the meat industry are scarce and are mainly generated by the North American Meat Institute (hereinafter, "N.A.M.I."), a not-for-profit trade association that lobbies for the expansion of the industry. Based on their economic model and information "[i]n 2019, the meat and poultry industry generated an estimated 1,221.82 billion in economic activity nationwide."[31] These numbers take into account companies that produce, process, distribute, and sell meat and poultry products.[32] This leading food industry also provides millions of jobs for Americans, immigrants, and undocumented employees. According to N.A.M.I., the meat industry employs "as many as 1,750,540 people nationally and generate[s] an additional 4,381,126 jobs in supplier and ancillary industries. These include jobs in companies supplying goods and services to manufacturers, distributors, and retailers, as well as companies whose sales depend on workers in the meat industry."[33] Most recently, this sector and the Occupational Safety and Health Administration of the U.S. Department of Labor (hereinafter, "O.S.H.A.") has been facing a serious backlash after several COVID-19 outbreaks in meatpacking and processing facilities unearthed the gruesome and inhumane conditions these workers face daily.[34] Meanwhile, recent congressional hearings revealed that

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29 *Food Availability and Consumption,* USDA, https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-availability-and-consumption/ (last visited Jan. 6, 2021).

30 Taylor A. Mayhall, *The Meat of the Matter: Regulating a Laboratory-Grown Alternative*, 74 Food & Drug L.J. 151 ,152 (2019).

31 John Dunham & Assoc., The Meat and Poultry Industry Creates Jobs in the United States, North American Meat Institute (2020), https://nami.guerrillaeconomics.net/reports/fdfc3016-f851-4331-a104-b76d74253a66.

32 *Id.*

33 *Id.*

34 Reports of working conditions in many meat packing and slaughtering facilities across the U.S. raise serious humanitarian and legal concerns. Severe working conditions and the lack of breaks have made injuries, amputations, and sexual harassment common in these workplaces. In some cases, death is reported due to fatal injuries or exhaustion. Although the turnover rate in these companies is significant, many employees are unable to leave or demand better conditions. Most of the workplace consist of low-income workers in desperate need for work, and immigrants —of varying immigration status— that cannot afford to lose their income. Language barriers and citizenship status facilitate abuse. Furthermore, many companies also hire these em-

O.S.H.A. practically turned a blind eye after thousands of worker complaints were made due to worker safety concerns arising from COVID-19 infections.[35]

ii. The price of meat

Generally, meat is priced using all the costs that were incurred in the process of raising the animal, feeding it, slaughtering it, transporting, packaging it, and selling it to the final customer. These material costs can be high. To align the rising demand with the need to provide affordable prices to consumers, this industry has expanded significantly in the past decades implementing mass production techniques and economies of scale that help reduce costs while increasing production. The rise of intensive factory farming has permitted livestock farmers across the nation to multiply their production by the millions. In accordance with the U.S.D.A. and with the U.S. Environmental Protection Agency (hereinafter, "E.P.A.") a farmer must adhere to the environmental, safety, and health regulations implemented depending on how his or her enterprise is classified.

A factory farm can be defined as "a farm on which large numbers of livestock are raised indoors in conditions intended to maximize production at minimal cost."[36] For governmental purposes, the terms Animal Feeding Operations (hereinafter, "A.F.O.s") and Concentrated Animal Feeding Operations (hereinafter, "C.A.F.O.s") are used for these operations. These classifications also allow farmers to apply for government loans and subsidies. A.F.O.s are defined by the E.P.A. as "agricultural operations where animals are kept and raised in confined situations."[37] In A.F.O.s, animals are not allowed to graze on the land seeking aliment rather, they are inhumanely confined to a space where they are fed and

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ployees as subcontractors to deny them benefits and worker rights. For more information on all these issues, *see* Abigail B. Long & Nicole Civita, Essential meat processing workers - Briefing Book, Business Unusual: Addressing Essential Workers' Needs During & After the COVID-19 Pandemic (2020), https://bioethics.jhu.edu/wp-content/uploads/2020/06/Essential-Meat-Processing-Workers-Briefing-Book-Final.pdf; Noam Scheiber & Michael Corkery, *Missouri Pork Plant Workers Say They Can't Cover Mouths to Cough*, N.Y. Times (Apr. 24, 2020), https://www.nytimes.com/2020/04/24/business/economy/coronavirus-smithfield-meat.html; Michael Corker & David Yaffe-Bellany, *The Food Chain's Weakest Link: Slaughterhouses*, N.Y. Times (Apr. 18, 2020), https://www.nytimes.com/2020/04/18/business/coronavirus-meat-slaughterhouses.html; Liz Crampton, *Too much meat, hungry Americans: Tough choices in food supply*, POLITICO (Apr. 16, 2020), https://www.politico.com/news/2020/04/16/too-much-meat-hungry-americans-tough-choices-in-food-supply-188467; Brian Stauffer, *When We're Dead and Buried, Our Bones Will Keep Hurting: Workers' Rights Under Threat in US Meat and Poultry Plants*, Human Rights Watch (Sept. 4, 2019), https://www.hrw.org/report/2019/09/04/when-were-dead-and-buried-our-bones-will-keep-hurting/workers-rights-under-threat; Andrew Wasley et al., *Two amputations a week: the cost of working in a US meat plant*, The Guardian (July 5, 2018), https://www.theguardian.com/environment/2018/jul/05/amputations-serious-injuries-us-meat-industry-plant; Peter Waldman & Kartikay Mehrotra, *America's Worst Graveyard Shift Is Grinding Up Workers*, Bloomberg Businessweek (Dec. 29, 2017), https://www.bloomberg.com/news/features/2017-12-29/america-s-worst-graveyard-shift-is-grinding-up-workers.

35 Leah Douglas, *Meatpacking plants in the spotlight at House hearing*, FERN'S AG Insider (Mar. 3, 2021), https://thefern.org/ag_insider/meatpacking-plants-in-the-spotlight-at-house-hearing/.

36 *Factory Farm*, Merriam Webster Dictionary, https://www.merriam-webster.com/dictionary/factory%20farm (last visited Apr. 13, 2022).

37 *Agricultural Animal Production*, EPA, https://www.epa.gov/agriculture/agricultural-animal-production (last visited Mar. 3, 2022).

kept until their time for slaughter arrives.[38] All the waste produced by these animals is confined within that small space as well, and in certain scenarios, it can spillover to the animals or their food and water supply.[39] "There are approximately 450,000 [A.F.O.s] in the [U.S.]."[40] When an A.F.O. holds more than 1,000 animal units or the equivalent of "1,000 head of beef cattle, 700 dairy cows, 2500 swine weighing more than 55 [pounds], 125 thousand broiler chickens, or 82 thousand laying hens or pullets,"[41] it is classified as C.A.F.O. Additionally "[a]ny size A.F.O. that discharges manure or wastewater into a natural or man-made ditch, stream or other waterway is defined as a C.A.F.O., regardless of size."[42] C.A.F.O.s are basically A.F.O.s on steroids. "Currently, there is no federal agency that collects or maps data on the number of [C.A.F.O.s] in the [U.S.]; however, using [U.S.D.A.] data previously available in 2019, it is estimated that there are several thousand."[43] Nonetheless, because of their widespread availability of low-cost animal feed, C.A.F.O.s and A.F.O.s are major producers of meat and highly processed foods at a relatively low costs. This allows producers to increase market availability of cheap animal protein products which are, as it will be demonstrated in the next sections, damaging for public health, and the environment.

iii. Hidden costs of meat

The price of meat, though, does not necessarily account for the non-financial costs or hidden costs its production might ensue. Some of these costs consist of: (1) environmental damage, since meat production is the second leading source/cause of global warming and a huge ecological threat;[44] (2) health costs, due to the risks of cardiovascular disease, diabetes, cancer, premature death, zoonotic diseases, and food contamination;[45] (3) animal welfare, as animals are paying a high price living an existence of torture, confinement and slaughter for human convenience, and (4) social costs, as food prices continue to rise, and developed countries continue to spend excessive amounts of resources into producing meat while developing countries struggle to produce enough aliment for their popu-

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38 *Id.*

39 *Id.*

40 *Animal Feeding Operations*, USDA, https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/livestock/afo/# (last visited Apr. 13, 2022).

41 *Id.*

42 *Id.*

43 Carlie Leoni & Kenneth Anspach, *Killing Factory Farm Funding to Resuscitate the World Food Economy*, 35 Natural Resources and Environment, A publication of the A.B.A., no. 3, 2021, at 10, 12 (*citing* U.S. Gov't Accountability Off., Report to Congressional Requesters, Concentrated Animal Feeding Operations (Sept. 2018)).

44 Seenarine, *supra* note 13, at 1.

45 *See* Eliza Barclay, *Americans should eat less meat, but they're eating more and more*, VOX (Oct. 1, 2016), https://www.vox.com/2016/8/18/12248226/eat-less-meat-campaign-fail; *One Health Zoonotic Disease Prioritization Process*, Centers for Disease Control and Prevention, https://www.cdc.gov/onehealth/pdfs/prioritization-fact-sheet-H.pdf_(last visited Mar. 3, 2022); *How Food Gets Contaminated – The Food Production Chain*, Centers for Disease Control and Prevention, https://www.cdc.gov/foodsafety/production-chain.html (last visited Mar. 3, 2022).

lation.[46] To put this last hidden cost into perspective, according to the United Nations Educational, Scientific and Cultural Organization (hereinafter, "U.N.E.S.C.O.") Institute for Water Education, approximately two pounds of steak need up to fifty-five pounds of grain and 15,000 liters of water to be produced.[47] This means we are currently using an excessively large amount of consumable food resources for the production of another food product instead of simply consuming that initial food resource. David Pimentel, a professor of ecology in Cornell University's College of Agriculture and Life Sciences, has stated that "[i]f all the grain currently fed to livestock in the United States were consumed directly by people, the number of people who could be fed would be nearly 800 million."[48] He also asserted that if those grains were exported, they could boost the U.S. trade balance by eighty billion dollars a year.[49] In addition to this, we use energy, fossil fuels, and natural resources to make meat happen. Without a doubt, the number of resources that go into producing meat is not just significant, but excessive and unnecessary.

iv. Roles of U.S. food subsidies in the meat industry

The meat industry, nonetheless, is no stranger to economic assistance from the U.S. government. An economic stimulus is provided to feed farms and slaughterhouses to promote growth and production. One of the main factors that drive this government expenditure is that the livestock industry is considered by authorities to be "essential to the Nation's economic stability, the viability of many rural communities, and the sustainability of a healthful and high-quality food supply for the American public."[50] These subsidies may appear to help consumers by artificially lowering the sales prices. Yet, what is often not considered is that these incentives are provided to the industry with taxpayer money, so the consumer pays the price. This means that whether you opt to exclude meat from your diet, you would still contribute economically to this industry through the taxes you pay to the government, which are used for economic stimuli.

Subsidies are defined as "government financial benefits paid to a specific industry.",[51] In the case of the agriculture industry or agrobusinesses, they given to help farmers reduce the risk of contingencies such as severe weather or events, disruptions in demand, and loss in commodities investments.[52] Livestock subsidizing ranks number eight in all the

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46 *The hidden costs of meat*, Slow Food, https://www.slowfood.com/much-meat-eat/explosion-of-animal-farming/the-hidden-costs-of-meat (last visited Mar. 3, 2022).

47 M.M. Mekonnen & A.Y. Hoesktra, I The Green, Blue and Great Water Footprint of Farm Animals and Animal Products 5 (2010), https://waterfootprint.org/media/downloads/Report-48-WaterFootprint-AnimalProducts-Vol1_1.pdf.

48 *U.S. could feed 800 million people with grain that livestock eat, Cornell ecologist advises animal scientists*, Cornell Chron. (Aug. 7, 1997), https://news.cornell.edu/stories/1997/08/us-could-feed-800-million-people-grain-livestock-eat.

49 *Id.*

50 U.S. Dep't of Agriculture & U.S. Environmental Protection Agency, Unified National Strategy for Animal Feeding Operations (1999), https://www3.epa.gov/npdes/pubs/finafost.pdf.

51 Kimberly Amadeo, *Farm Subsidies with Pros, Cons, and Impact*, The Balance (Nov. 9, 2020), https://www.thebalance.com/farm-subsidies-4173885.

52 *Id.*

farm-related subsidies by the U.S. government.[53] Though, it is important to note that the most subsidized industry in the U.S. is the corn industry,[54] more than ninety-five percent of the corn produced is used for livestock feed. This means that almost all the subsidizing for the corn industry indirectly benefits the livestock industry as well.[55]

For the years 1995 to 2020, there were 977,870 recipients of livestock subsidies who received an overall subsidy total of 12,458,279,639 dollars.[56] However, subsidizing does not necessarily contribute to small and local businesses as it should. Since the requirements to qualify can be complex and related to the size and structure of the business itself, normally, "only large producers can take advantage of farm subsidies."[57] This becomes even more clear if we take into account that "[f]ifty people on the Forbes 400 list of the wealthiest Americans received farm subsidies[, while] [o]n the other hand, 62 [percent] of U.S. farms did not receive any subsidies."[58]

Some environmental requirements are included in eligibility for subsidies but considering the current environmental impact of this industry and the fact that the policy makers have not addressed extensively the environmental and health risks that intensive factory farming brings upon its citizens, it is safe to conclude that these are not being taken as seriously as they should. It is imperative that the government addresses the hidden costs associated with livestock farming and meat processing requiring greater commitments for sustainability and transparency as a prerequisite for financial assistance. Legislation related to farming has "shaped the American agricultural economy for the past century . . . [and] helped our country stabilize its domestic food production and competitiveness on the international market,"[59] nevertheless, it has the potential to do much more. The government needs to hold this industry accountable. Reexamining current legislation and creating a new more stringent statutory agricultural framework is an excellent way of doing so. Loans and assistance may be provided conditionally based on the compliance of a more sustainable business model. Some of these tactics may involve reducing production or finding a more sustainable way of providing sustenance for livestock. With the lessons learned from the covid pandemic we stand at the crossroads of reforming towards a towards a healthier and sustainable future. "The COVID-19 pandemic is only beginning to shed light on which of our farm bill programs work for a growing population in an unstable food economy, and which programs do not. It can also inform how we make more farm bill programs adaptable and prosperous going forward." [60]

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53 *The United States Farm Subsidy Information*, EWG, https://farm.ewg.org/region.php?fips=00000 (last visited Apr. 13, 2022).

54 *Id.*

55 *Feedgrains Sector at a Glance*, U.S.D.A. ECONOMIC RESEARCH SERVICE, https://www.ers.usda.gov/topics/crops/corn-and-other-feedgrains/feedgrains-sector-at-a-glance/#:~:text=Corn%20is%20the%20primary%20U.S.,energy%20ingredient%20in%20livestock%20feed (last visited April 8, 2022).

56 *The United States Farm Subsidy Information, supra* note 53.

57 Amadeo, *supra* note 51.

58 *Id.*

59 Leoni & Anspach, *supra* note 43.

60 *Id.*

C. Environmental damage and contribution towards climate change

i. Greenhouse gas emissions

"The international scientific consensus indicates we are on a deadly, self-made trajectory due to increasing amounts of [greenhouse gases (hereinafter, "GHG")] from economic activities."[61] As previously mentioned, producing meat for consumption is one of the largest contributors to climate change because of its colossal contribution of GHG into the atmosphere. In simple terms, GHG are those which trap heat in the atmosphere. They consist of carbon dioxide (hereinafter, "CO2"), methane, nitrous oxide, and fluorinated gases.[62] "Each of these gases can remain in the atmosphere for different amounts of time, ranging from a few years to thousands of years."[63] Since 1970, CO2 emissions have increased approximately by ninety percent. Today, agriculture and deforestation, caused mainly by the process of land clearing for livestock feed production, are the second-largest contributors to GHG worldwide and consequently of global warming.[64] It is estimated that *"[a]nimal agriculture is responsible for [eighteen percent] of all GHG . . .*, which is more than all transportation emissions combined."[65] Because of cost-saving measures, farmers rarely feed these animals the correct diet that they require. Hence, they often find themselves sick, bloated, and constantly suffering from indigestion and intestinal issues.[66] For instance, "[i]n factory farms, cattle eat soy, corn silage, industrial by-products (including ethanol, fructose, and corn syrup derivatives), grains, supplements, and, of course, antibiotics instead of grass and hay. This unnatural diet produces stomach swelling, diarrhea, and other problems."[67] When farm animals are being transported from one place to another, the movement of the vehicles causes these already ill-feeling animals to belch and release gas, specifically CO2. This situation might seem insignificant, but at a global scale, its effects on the planet are quite frightening.

To satisfy the increasing demand for meat worldwide, livestock is bred across the world by the billions, this has exponentially increased this industry's footprint in the environment. As of 2015, the number of animals raised as livestock for consumption worldwide amounted to approximately 19.6 billion chickens, 1.4 billion cattle, and 980 million pigs, and these continue to grow with world population and demand.[68] The increases in GHG and global temperatures in the past decades, places our safety and planet in danger. As a result, extreme weather events, such as droughts, hurricanes and wildfires which can

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61 Melissa K. Scanlan, *Climate Risk is Investment Risk*, 35 Nat. Res. & Env't Mag., Fall 2020, at 18, 20.

62 *Overview of Greenhouse Gases*, U. S. Environmental Protection Agency, https://www.epa.gov/ghgemissions/overview-greenhouse-gases (last visited Apr. 13, 2022).

63 *Id.*

64 *Id.*

65 Lacey Bourassa, *Vegan and Plant-Based Diet Statistics for 2021*, Plant Proteins Co. (Jan. 13, 2021), https://www.plantproteins.co/vegan-plant-based-diet-statistics/.

66 Seenarine, *supra* note 13, at 3.

67 *The hidden costs of meat, supra* note 46.

68 Brad Plumer, *These maps show where all the world's cattle, chickens, and pigs are*, VOX (Feb. 5, 2015), https://www.vox.com/2014/6/20/5825826/these-maps-show-where-all-the-worlds-cattle-chickens-and-pigs-live.

disrupt the food supply are some of the many dangers that are becoming common. GHG are not only threatening to the environment but may also contribute to respiratory disease from smog and air pollution.[69]

To tackle the imminent global health threat that is climate change and the rising amount of GHG on our atmosphere, on December 12, 2015, 196 States entered into *The Paris Agreement*, the multilateral international treaty on climate change.[70] The goal of this treaty is to limit global warming "to well below [two], *preferably to 1.5 degrees Celsius*, compared to pre-industrial levels."[71] Some countries have taken some measures to achieve this goal due to political pressure, but the measures so far taken are not enough to achieve the stated goal. In other cases, adopted environmental measures respond to non-environmental concerns or incentives. In the U.S., progress has been made cutting resource use and GHG emissions in the livestock industry, for example, "U.S. beef production in 2007 required [nineteen percent] less feed, [thirty-three percent] less land, and [twelve percent] less water [which resulted in] a [sixteen percent] reduction in GHG emissions per kilogram of beef compared with production in 1977."[72] Still, these are changes that have been implemented progressively, by the adoption of new and changing technologies, focused more on productivity and efficiency. Consequently, an environmentally sustainable mindset has not been the primary driver for these changes to occur, but a more secondary benefit.[73] Consequently, a real significant change will not be made if sustainable and environmentally focused management strategies are not prioritized.

ii. Contamination of waterways

The industry's contribution to climate change is not the only environmentally negative impact caused by livestock farming and meat consumption. In factory farming, waterways are contaminated by chemicals and fertilizers used. The excessive amount of manure in A.F.O.s and C.A.F.O.s contaminates the surrounding areas with bacteria and heavy metals like phosphorus and nitrogen, destroying the ecosystem around the waterways and exposing communities to unsafe drinking water.[74] This is what the *Clean Water Act* (hereinafter, "C.W.A.") was created to regulate.[75] The C.W.A. regulates livestock farming through the National Pollutant Discharge Elimination System (hereinafter, "N.P.D.E.S.") which is in charge of regulating *point sources* of pollution. C.A.F.O.s are defined under the C.W.A. as

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69 *Climate Change Battle: Causes, Effects, and Solutions*, TerraPass (Oct. 1, 2019), https://www.terrapass.com/blog/climate-change-battle-causes-effects-and-solutions.

70 UNFCCC, Paris Agreement, Dec. 12, 2015, T.I.A.S. No. 16-1104.

71 *The Paris Agreement,* UNFCCC, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement (last visited Apr. 13, 2022).

72 Judith L. Capper, *Opportunities and Challenges in Animal Protein Industry Sustainability: The Battle Between Science and Consumer Perception*, 10 Animal Frontiers 7, 7-8 (2020).

73 *Id.*

74 Nathan Beacom, *Farms may depend on water — but they are also polluting it*, America: the Jesuit Review (May 28, 2020), https://www.americamagazine.org/politics-society/2020/05/28/farms-may-depend-water-they-are-also-polluting-it.

75 Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1387 (1972) (the Clean Water Act is the principal law for controlling pollution of rivers, lakes, and wetlands in the U.S.).

point source; any A.F.O. that discharges pollutants to the waters of the U.S. is also regulated under this premise.[76] To comply with the N.P.D.E.S. requirements, C.A.F.O. operators must develop a nutrient management plan that includes control measures for both the production and the land application areas of the operation, as well as record-keeping and reporting requirements. If the discharge of pollutants is made to state waters, then an environmental state permit is required instead of having to follow N.P.D.E.S. regulation. On some occasions, though, the C.A.F.O. might be large enough to contaminate U.S. waters and state waters, therefore, it will be regulated by both. Nonetheless, these regulations are often not enough to contravene the injurious impact of C.A.F.O.s to communities. News and incident reports of C.A.F.O.s contaminating waterways and therefore threating the livelihood and health of adjacent communities are commonplace.[77] Most recently, "[t]he role of [C.A.F.O.s] in the national food system [has been] . . . called into question."[78] In 2019, the *Farm System Reform Act* of 2019, which would eliminate C.A.F.O.s gradually until 2040 was introduced. However, this bill never left Senate's Agriculture, Nutrition, and Forestry committee.[79]

iii. Depletion of Natural Resources

As briefly mentioned before, there are significant hidden costs related to meat production that are not accounted for in the price consumers pay for their meat products. Besides the environmental damage and health hazards inherent to consumption, many resources are spent on raising livestock. According to the Food and Agriculture Organization of the United Nations (hereinafter, "F.A.O."), "[t]he livestock sector is a major user of natural resources such as land and water, currently using about thirty-five percent of total cropland and . . . approximately ten percent of the estimated annual global water flows . . ."[80] Additionally, livestock farming is:

> [T]he world's largest user of land resources, with pasture and arable land dedicated to the production of feed representing almost [eighty percent]

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76 *What are the Clean Water Act Requirements That Apply to Animal Agriculture?,* Livestock and poultry environmental learning community (Mar. 5, 2019), https://lpelc.org/what-are-the-clean-water-act-requirements-that-apply-to-animal-agriculture/.

77 Sam Bloch, Largest ever fine for water pollution goes to a CAFO – and it's a horse track in New Orleans, The Counter (Oct. 8, 2020), https://thecounter.org/epa-clean-water-act-fine-fair-grounds-race-track/; Jane Johnston & Circle of Blue, One Michigan county tells the story of a nation plagued by water pollution, Michigan Radio (Sep. 24, 2020), https://www.michiganradio.org/post/one-michigan-county-tells-story-nation-plagued-water-pollution; Jack Healy, Rural America's Own Private Flint: Polluted Water Too Dangerous to Drink, N.Y. Times (Nov. 3, 2018), https://www.nytimes.com/2018/11/03/us/water-contaminated-rural-america.html; Kendra Pierre-Louis, Lagoons of Pig Waste Are Overflowing After Florence. Yes, That's as Nasty as It Sounds, N.Y. Times (Sept. 19, 2018), https://www.nytimes.com/2018/09/19/climate/florence-hog-farms.html.

78 Jane Johnston & Circle of Blue, *One Michigan county tells the story of a nation plagued by water pollution*, Michigan Radio (Sep. 24, 2020), https://www.michiganradio.org/post/one-michigan-county-tells-story-nation-plagued-water-pollution.

79 *Id.*; *see* Farm System Reform Act of 2019 S. 3221,116th Cong (2019) (*citing* that the objective is "to place a moratorium on large, concentrated animal feeding operations, to strengthen the Packers and Stockyards Act, 1921, to require country of origin labeling on beef, pork, and dairy products, and for other purposes.").

80 Food and Agriculture Organization, Water use in livestock production systems and supply chains (2019), http://www.fao.org/3/ca6649en/ca6649en.pdf.

> of the total agricultural land. One-third of global arable land is used to grow feed, while [twenty-six percent] of the Earth's ice-free terrestrial surface is used for grazing.[81]

Naturally, the production of different meat products requires the consumption of different amounts of resources. For instance, when comparing beef to chicken, the impact on land use, water use, and GHG ranges from three to ten times as much, and pork comes in second place.[82] But, overall, the meat industry is very damaging to the environment and consumes too many resources to deliver a single product.[83]

In 1969, the *National Environmental Policy Act* (hereinafter, "N.E.P.A.") was enacted. This act established a broad national framework for protecting the environment by requiring federal agencies to assess the environmental effects of their proposed actions prior to making decisions, obligating federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach.[84] This regulatory framework has been made to reduce the impact of depletion of natural resources and contamination of waterways. Nonetheless, it has not proven to be as effective as it should have been as seen by the persistence of significant environmental issues. N.E.P.A., whose implementation in federal agencies is overseen by the President's Council on Environment Quality (hereinafter, "C.E.Q."), establishes the preparation of reports that assessed the environmental impact of the proposed action based on the size of the project.[85] Environmental Assessments (hereinafter, "E.A.") are used to determine whether an action is a "major federal action significantly affecting the quality of the human environment."[86] As part of the environmental review process of an action, a public hearing is held, and a notice must be published in the local newspapers notifying that an E.A. report is available for inspection and that a public hearing will be held.[87] These provide the public an opportunity to get involved in the agencies' decision process and only have two possible results: (1) Finding of No Significant Impact (F.O.N.S.I.), or (2) Notice of Intent to Prepare an Environmental Impact Statement (E.I.S.).[88] An E.I.S. outlines the impact of a proposed project on its surrounding environment.[89] N.E.P.A. is particularly useful in the use of land for meat production, specifically, range improvement projects such as water developments or fences, and most importantly federal grazing permit re-

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81 *Meat and Animal Feed*, Global Agriculture, https://www.globalagriculture.org/report-topics/meat-and-animal-feed.html (last visited Apr. 13, 2022).

82 Hannah Ritchie, *Which countries eat the most meat?* BBC News (February 4, 2019), https://www.bbc.com/news/health-47057341.

83 *Id.*

84 National Environmental Policy Act, 42 U.S.C. §§ 4321-47; *What is the National Environmental Policy Act?,* U. S. Environmental Protection Agency, https://www.epa.gov/nepa/what-national-environmental-policy-act (last visited Apr. 13, 2022).

85 *Id.*

86 *Environmental Assessment*, National Preservation Institute, https://www.npi.org/environmental-assessment (last visited Apr, 13, 2022).

87 Environmental Assessments, 23 C.F.R. § 771.119(e) (2022).

88 *Environmental Assessment, supra* note 86.

89 *Id.*

newals are all analyzed under N.E.P.A. via an E.A. or an E.I.S.[90] However, most proposed grazing permit renewals are not perceived to significantly affect the environment and will be prepared only requiring an E.A.[91]

N.E.P.A. systematic approach has significant issues that allow the environmental impact of the meat industry to continue taking its toll in the U.S. According to the National Preservation Institute:

> Since the [C.E.Q.] regulations are vague about what should be in an [E.A.], many if not most agencies and consultants simply adapt the much more detailed procedures for doing Environmental Impact Statements [(E.I.S.s)]. This tends to result in long, complicated, costly documents that are, in essence, [E.I.S.s] with little or no public participation, and that are not particularly clear about why the agency thinks impacts will not be significant.
>
> [E.A.s] and [E.I.S.s] serve fundamentally different purposes. An [E.A.] is to determine whether a specific threshold is crossed – the threshold of "significant" impact. An [E.I.S.] simply has to reveal the impacts, not demonstrate that a threshold is or is not crossed. When an [E.A.] [turns] into a [mini-E.I.S.,] it becomes a document that often does not clearly show that there will or will not be a significant impact. Instead [,] it merely discusses all the impacts (at best), and then asserts a conclusion whose relationship to the analysis is not always very clear.[92]

Furthermore, the Trump administration established some changes that took place since November 19, 2020. In N.E.P.A., any action that is classified as a categorical exclusion does not have to submit an E.A. or an E.I.S.[93] Categorical exclusions have been determined by the C.E.Q. to not have an individual or cumulative significant effect on the human environment.[94] Before the implementation of these changes, "neither the United States Forest Service [(U.S.F.S.)] nor the Bureau of Land Management [(B.L.M.)] had authority to use a [c]ategorical [e]xclusion . . . with regard to . . . domestic grazing activities."[95] Now, six new categorical exclusions have been added, and among them some that benefit livestock farming, including using previous environmental analysis for a subsequently proposed action.[96] Most recently, under the administration of president Joe Biden, a multi-phased

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90 Jim Sprinkle, et al., NEPA for Ranchers: Applying the NEPA process on USFS and BLM rangelands for the authorization of livestock grazing, 1-2 (2020), https://extension.arizona.edu/sites/extension.arizona.edu/files/attachment/gila-nepa-for-ranchers.pdf.

91 *Id.*

92 *Environmental Assessment, supra* note 86.

93 *Categorical Exclusions*, NEPA.gov, https://ceq.doe.gov/nepa-practice/categorical-exclusions.html (last visited Apr. 13, 2022).

94 *Id.*

95 Sprinkle, *supra* note 90.

96 *USFS Proposes Revised NEPA Regulations*, Columbia Climate School Sabin Center for Climate Change Law, https://climate.law.columbia.edu/content/usfs-proposes-revised-nepa-regulations (last visited Apr. 13, 2022); USFS Finalizes Revised NEPA Regulations, Columbia Climate School Sabin Center for Climate Change Law, https://climate.law.columbia.edu/content/usfs-finalizes-revised-nepa-regulations (last visited Apr. 13, 2022).

process has begun to reverse some of these Trump-era modifications to N.E.P.A., however, the scope and depth of this review seems to be very limited.[97]

iv. Meat: The second leading cause of global warming

As a significant contributor to climate change, the meat industry is indubitably one of the main culprits for the extreme weather events and changing climate in the past decades. One of the reasons why it is so difficult to associate environmental damage with meat consumption is because people's minds often focus on their necessities and the factors that they believe immediately affect their lives while putting aside the consequences of their actions which they cannot directly perceive. "Climate warming is not just a political, social and economic issue. It is a deeply psychological one as well. People's emotional and cognitive responses to this new reality can run the gamut from denial to indifferences to outrage to anger to grief."[98] The environmental hazards that we face daily caused indirectly by livestock farming and meat consumption are not only concerning but deadly. The World Health Organization (W.H.O.), estimates that between 2030 and 2050 climate change will causes approximately 250,000 additional deaths per year.[99] This number includes deaths that result from extreme weather conditions caused by the global warming crisis, which will continue to increase.[100] Another aspect that weighs on climate change mortality rates are the "[c]hanges in temperature and rainfall conditions [which] . . . may influence transmission patterns for many diseases, including water-related diseases, such as diarrhea, and vector-borne infections, including malaria."[101] However, these mortalities are more predominant in developing countries and, therefore, do not cause a strong enough impression or impact on developed countries, mostly responsible for livestock farming, meat production, and the global warming crisis. This unsettling issue can be perfectly summed up in the words of Dr. Moses Seenarine,[102] an expert on climate change, who states that "[c]limate warming is undermining five decades of progress in health."[103]

D. The health-related hazards of meat production and consumption

i. Diseases linked to red meat consumption

According to a manuscript resulting from a medical investigation on meat consumption, the replacement of red meat, such as beef, pork and lamb, with alternative healthy

97 Olympia "Libby" Bowker & Mina S. Makarious, *Biden-Harris Administration Proposes NEPA Regulatory Revisions*, JDSupra (Jan. 25, 2022), https://www.jdsupra.com/legalnews/biden-harris-administration-proposes-2252161/.

98 Seenarine, *supra* note 13 at 3.

99 *Climate Change*, World Health Organization, https://www.who.int/health-topics/climate-change#tab=tab_1 (last visited Apr. 13, 2022).

100 *Id.*

101 *Id.*

102 Dr. Moses Seenarine's work has been cited by U.N.E.S.C.O.; F.A.O.; Human Rights Watch' Anti-Slavery International, among others; *See Moses Seenarine*, Mobilizing Ideas, https://mobilizingideas.wordpress.com/moses-seenarine/ (last visited Apr. 13, 2022).

103 Seenarine, *supra* note 13 at 2.

dietary components, such as eggs and fish, whole grains and vegetables, may lower the mortality risk.[104] This stems from the fact that red meat intake has been associated with an increased risk of cardiovascular disease (C.V.D.), coronary heart disease (C.H.D.), colorectal cancers and other several cancers such as non-Hodgkin lymphoma (N.H.L.), bladder, breast, colorectal, endometrial, esophageal, gastric, lung and nasopharyngeal cancer.[105] "[D]ietary iron, particularly heme iron primarily from red meat, has been positively associated with myocardial infarction and fatal [C.H.D.]."[106] These risks are commonly known to doctors, nutrition experts and the general public. However, the consumption of beef, pork, and venison, among others, continues to be significant, especially in the U.S. A key factor that influences this response is the Government's refusal to acknowledge the associated hazards due to political pressures and lobbying. When searching the Food-based Dietary Guidelines for the United States of America for the years 2015 to 2020, published in 2016 by the Food and Agriculture Organization (F.A.O.), we can observe that there is limited mention of the risks related to red meat consumption or any emphasis on lowering the consumption of red meat.[107] In its ambiguity it mentions that "[a] healthy eating pattern includes . . . [a] variety of protein foods, including seafood, *lean meats and poultry*, eggs, legumes (beans and peas), and nuts, seeds, and soy products."[108] Before these guidelines were published, the nutrition community believed they would implement a reduction in red and processed meats since this information had been previously divulged by the Dietary Guidelines Advisory Committee.[109] However, after much lobbying in Congress from the meat industry, this recommendation did not go through in the final version of the guidelines.[110] Similarly, the Guidelines Advisory Committee had also included a section on environmental sustainability in their report, which was a giant leap towards environmental accountability in the food industry.[111] However, due to lobbying, it was also removed from the final version of the Guidelines.[112] As mentioned earlier, the meat industry is extremely

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104 An Pan et al., *Red Meat Consumption and Mortality: Results from Two Prospective Cohort Studies*, National Center for Biotechnology Information (July 16, 2013), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3712342/.

105 Yin Huang et al., *Red and Processed Meat Consumption and Cancer Outcomes: Umbrella Review*, National Library of Medicine (March 27, 2021), https://pubmed.ncbi.nlm.nih.gov/33838606/; Renata Micha et al., *Red and Processed Meat Consumption and Risk of Incident Coronary Heart Disease, Stroke, and Diabetes Mellitus: A Systematic Review and Meta-Analysis*, National Library of Medicine (May 17, 2010), https://pubmed.ncbi.nlm.nih.gov/20479151/; Adam M. Bernstein et al., *Major Dietary Protein Sources and Risk of Coronary Heart Disease in Women*, National Library of Medicine (August 16, 2010), https://pubmed.ncbi.nlm.nih.gov/20713902/; *Red Meat, Processed Meat and Cancer*, Cancer Council, https://www.cancercouncil.com.au/1in3cancers/lifestyle-choices-and-cancer/red-meat-processed-meat-and-cancer/ (last visited Apr. 13, 2022).

106 Pan, *supra* note 104.

107 *Food-based Dietary Guidelines – United States of America*, Food and Agriculture Organization of the United Nations, http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/countries/united-states-of-america/en/ (last visited Apr. 13, 2022); Dietary Guidelines for Americans 2015-2020 Eight Edition (2015), https://health.gov/sites/default/files/2019-09/2015-2020_Dietary_Guidelines.pdf.

108 Dietary Guidelines for Americans 2015-2020 Eight Edition xiii (2015), https://health.gov/sites/default/files/2019-09/2015-2020_Dietary_Guidelines.pdf (emphasis added).

109 Arielle Duhaime-Ross, *New US Food Guidelines Show the Power of Lobbying, Not Science*, The Verge (January 7, 2016), https://www.theverge.com/2016/1/7/10726606/2015-us-dietary-guidelines-meat-and-soda-lobbying-power.

110 *Id.*

111 *Id.*

112 *Id.*

powerful in the U.S. and their influence affects our daily lives. As it stands, the industry has significant influential sway over public policy matters such as how tax monies are used, and the official government nutritional and dietary recommendations made to the public.

ii. Contamination risks during the processing and consumption of meat

In 1906, Upton Sinclair, an American writer and political activist published a book called *The Jungle*, and exposed some alarming realities in the meat packing industry.[113] Sinclair based his book on the fictional tale of a young man called Jurgis Rudkis who worked in the meat-packing business to make a living.[114] Sinclair investigated the conditions in which meat packing plants operated in and used them as an inspiration for the conditions in which this fictional character found himself in.[115] Even though the character in his book was fictional, the conditions in the meat packing company where this character worked mirrored reality. In this book:

> Jurgis soon learned how the company sped up the assembly line to squeeze more work out of the men for the same pay. He discovered the company cheated workers by not paying them anything for working part of an hour.
>
> Jurgis saw men in the pickling room with skin diseases. Men who used knives on the sped-up assembly lines frequently lost fingers. Men who hauled 100-pound hunks of meat crippled their backs. Workers with tuberculosis coughed constantly and spit blood on the floor. Right next to where the meat was processed, workers used primitive toilets with no soap and water to clean their hands. In some areas, no toilets existed, and workers had to urinate in a corner. Lunchrooms were rare, and workers ate where they worked.[116]

Even though these conditions have improved over time and are now regulated by the U.S.D.A. and O.S.H.A., they are still occurring to some extent in the food industry. As previously mentioned, workers often face human rights and labor violations, which include unsanitary working conditions around the meat handled.[117] The increased risk of contamination and disease by the mishandling of the meat product poses a direct threat to the consumer who is unaware of these conditions.

Meat consumption also possesses certain contamination risks that are inherent to consuming living beings. An important fact to keep in mind is that:

> [I]nfectious diseases . . . can manifest in food processing areas due mainly to poor personal hygiene and processing sanitation practices, which in

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113 Upton Sinclair, The Jungle (1906).

114 *Upton Sinclairs The Jungle: Muckraking the Meat-Packing Industry*, 24(1) Bill of Rights in Action, (2018) https://www.crf-usa.org/bill-of-rights-in-action/bria-24-1-b-upton-sinclairs-the-jungle-muckraking-the-meat-packing-industry.html.

115 *Id.*

116 *Id.*

117 *See* note 34 of this text.

> turn can develop the growth of bacteria, viruses, moulds, and yeasts. These can then set the stage for [f]oodborne infection, such as salmonella or trichinosis, caused by ingesting food that is contaminated with bacteria, parasites, and viruses [; and] [f]oodborne intoxication, either bacterial, such as E. coli, or chemical, where food has been contaminated with toxic chemicals, such as cleaning compounds or pesticides.[118]

The Center for Disease Control & Prevention (C.D.C.) estimates that "each year roughly [one] in [six] Americans (or 48 million people) get sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases."[119] Of the top five pathogens contributing to domestically acquired foodborne illnesses, three of them are directly related to meat consumption: *Salmonella* nontyphoidal, *Clostridium perfringens* and *Campylobacter spp*.[120] This contamination can occur at any moment during the food production chain of the meat product, whether it be "production, processing, distribution, or preparation."[121] An example of contamination during the processing stage occurs "[d]uring the slaughter process, [since] germs on an animal's hide that came from the intestines can get into the final meat product."[122] During distribution, "[i]f refrigerated food is left on a loading dock for long time in warm weather, it could reach temperatures that allow bacteria to grow[,] [additionally] [f]resh produce can be contaminated if it is loaded into a truck that was not cleaned after transporting animals or animal products."[123] Finally, during preparation "[c]ontamination can occur in a refrigerator if meat juices get on items that will be eaten raw [or] [i]f a cook uses a cutting board or knife to cut raw chicken and then uses the same knife or cutting board without washing it to slice [vegetables]."[124]

iii. Antibiotic resistance

Livestock are fed antibiotics constantly to kill and stop the growth of bacteria and avoid food contamination. Since humans feed on these heavily drugged animals, we ultimately consume these antibiotics and might develop antibiotic resistance. Unnecessary use of antibiotics needs to be reduced to stop this resistance from spreading.[125] In addi-

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118 BC Cook Articulation Committee, Meat Cutting and Processing for Food Service 24 (2015).

119 *Burden of Foodborne Illness: Findings*, Centers for Disease Control and Prevention, https://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html (last visited Jan. 3, 2022).

120 *Id.*

121 *How Food Gets Contaminated – The Food Production Chain*, Centers for Disease Control and Prevention, https://www.cdc.gov/foodsafety/production-chain.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Ffoodsafety%2Foutbreaks%2Finvestigating-outbreaks%2Fproduction-chain.html (last visited Apr. 13, 2022).

122 *Id.*

123 *Id.*

124 *Id.*

125 *Antibiotic Resistance, Food, and Food Animals*, Centers for Disease Control and Prevention, https://www.cdc.gov/foodsafety/challenges/antibiotic-resistance.html (last visited Jan. 3, 2022).

tion to this, "[a]nimals, like people, carry bacteria in their guts."[126] Some of these bacteria may be antibiotic resistant, also known as *superbugs,* and be transmitted to us through consumption, making the treatment of bacterial diseases difficult.[127] "In recent years, the C.D.C. has investigated many multistate [intestinal illness] outbreaks caused by antibiotic-resistant bacteria . . . [which] have been linked to contaminated food and to contact with farm animals, pets, and pet food and treats."[128]

iv. Zoonosis and pandemics

Disease related risks, nonetheless, are not just assumed by those that consume animals and animal-based products, but especially by workers that are involved in the production chain of meat who are exposed to flesh, carcass, fluids, and animal waste daily. "Proximity to intensive livestock management systems [has] . . . been associated with increased disease incidence among humans."[129] These exposures have been responsible for many zoonotic diseases in human history, which have often ravaged populations, caused serious disruptions in human life, and posed a threat to individual and global health. Zoonotic diseases are those "that can be transmitted from animals to humans and from humans to animals."[130] It is important to understand that:

> Emerging and endemic zoonotic diseases pose a threat not only to the health of animals and humans but also to global health security. An estimated [sixty percent] of known infectious diseases and up to [seventy-five percent] of new or emerging infectious diseases are zoonotic in origin. Globally, infectious diseases account for 15.8 [percent] of all deaths and 43.7 [percent] of deaths in low-resource countries. It is estimated that zoonoses are responsible for 2.5 billion cases of human illness and 2.7 million human deaths worldwide each year.[131]

A most recent example of a newly formed zoonotic disease is the virus COVID-19, which has accounted as of April 2022 to approximately 500 million cases and six million deaths worldwide.[132] But the world is no stranger to pandemics from zoonotic diseases, the bubonic plague, Ebola, mad cow disease, and the avian and swine Flu, are among the many

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126 *Id.*

127 *Id.*

128 *Id.*

129 Jeremy J. Hess et al., *Projecting Climate-Related Disease Burden: A Guide for Health Departments*, Centers for Disease Control and Prevention, 37, https://www.cdc.gov/climateandhealth/docs/ProjectingClimateRelatedDiseaseBurden_508.pdf (last visited Apr. 13, 2022) (footnote omitted).

130 Kevin D. Pelzer & Nancy Currin, *Zoonotic Diseases of Cattle*, 400-60, Virginia Cooperative Extension 1 (2005), https://vtechworks.lib.vt.edu/bitstream/handle/10919/50703/400-460.pdf.

131 Stephanie J. Salyer et al., *Prioritizing Zoonoses for Global Health Capacity Building – Themes from One Health Zoonotic Disease Workshops in 7 Countries, 2014-2016*, 23 Emerging Infectious Diseases Journal S57 (2017).

132 *COVID-19 Coronavirus Pandemic*, Worldometer, https://www.worldometers.info/coronavirus/ (last visited Jan. 4, 2022).

zoonotic diseases in existence.[133] Currently, in the U.S. there are approximately fifteen cattle diseases with zoonotic potential which pose a threat to human health.[134] Some of these diseases include: "anthrax, Escherichia coli, leptospirosis, pseudocowpox, Q fever, rabies, ringworm, salmonellosis, tuberculosis, and vesicular stomatitis."[135] Now more than ever, awareness of the risks and consequences of contact with animal fluids, waste, and tissue should be taken into account when examining the livestock industry, the meat processing factories, and institutions such as wet markets in Asian countries, which encourage the sale and consumption of live animals.

The significant health risks should be considered a priority when making decisions in the meat industry. This assessment should be made from the beginning of the chain of production, which is livestock farming, to the end of the chain, which is the delivery and consumption of the final meat product. "The impact of consumer preferences should not be underestimated—future livestock systems will either have to demonstrate that production intensification can be synonymous with good health and welfare, or amend systems accordingly, such that an acceptable middle ground can be found."[136]

II. Possible Solutions and Alternative Markets

As modern society experiences firsthand the results of climate change, global pandemics and health risks associated with the meat industry they become more aware of the urgency to reform this industry and individual behavioral patterns. It is crucial to acknowledge and work on the vulnerability of livestock farming and the whole meat industry system, while seeking alternative options that might keep the food supply plentiful in times of crisis. There are different approaches and alternatives that can be taken to help the meat problematic; these will be explored below.

A. A more stringent approach to regulating the meat industry based on international benchmarking

A transformation from the mindset of investors, stakeholders, and industry leaders must occur immediately, the focus cannot be only numbers and quantifiable figures, but sustainability and environmental consciousness must be considered as well. A significant distinction must be made between the concept of environmental social governance and corporate social responsibility strategies, where both are prioritized and used as a principal base for decision making in the development of corporate and managerial strategies.[137]

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133 *Zoonotic Pandemics – Viruses, Animals, and Humans in a Globalised World*, Proveg International (August 11, 2020), https://proveg.com/blog/zoonotics-pandemics-viruses-animals-and-humans-in-a-globalised-world/; Sara González, *Zoonoses: Animals and Major Pandemics in History*, OpenMind BBVA (April 13, 2020), https://www.bbvaopenmind.com/en/science/bioscience/zoonoses-animals-and-major-pandemics-in-history/.

134 Pelzer & Currin, *supra* note 130 at 1.

135 *Id.*

136 Capper, *supra* note 72 at 11.

137 Christopher Bell & John Voorhees, *Using Standards as a Framework for Environmental and Social Governance*, 35-2Nat. Res. & Env't Mag., Fall 2020, at 41.

Corporate leaders must take into consideration a series of issues, factors and sectors that are moving towards transparency, environmental responsibility, and socially responsible operations. The expectations of investors, financiers, customers, employees, advocacy groups, and the public at large can be more influential than legal requirements as "they can directly affect an organization's success in markets, workforce morale, access to capital, and community acceptance of their right to operate."[138] Additionally, even if these requirements are not standardized yet or adopted as legal ordinance, a shift in consumption patterns and investments towards more sustainable practices and transparency regarding these matters will push lawmakers to action.

i The European Union's Non-Financial Reporting Model and Meat Processing Policies

It is especially crucial that corporate reporting includes non-financial information to inform customers and investors of the company's environmental footprint and sustainable practices. "Unlike the largely voluntary approach in the United States, the European Union's (hereinafter, "E.U.") Non-Financial Reporting Directive mandated such reporting, effective 2017, and required certain E.U. corporations to report on environmental, social, and governance metrics."[139] The European Union's *Directive 2014/95 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups* (hereinafter, "Directive 2014/95") laid out the overall sustainability goals that would eventually lead "to a *resource-efficient Europe*."[140] This directive was approved in response to the United Nations Conference on Sustainable Development (Rio +20) whose main focus was to be "an action-oriented conference, where all stakeholders, including Major Groups, the UN System/IGOs, and Member States were invited to make commitments focusing on delivering concrete results for sustainable development on a voluntary basis."[141] It was in this conference that the international focus shifted significantly to the recognition of important corporate sustainability reporting. The international conference focused on encouraging industries, governments, and stakeholders to move towards the inclusion of non-financial sustainable information into their reporting cycle and to work on the development and adoption of models for best practices, taking into account exiting frameworks.[142] Article 19a of Directive 2014/95 lays out the elements required in a non-financial statement which are to be used by public-interest entities whose average number of employees exceeds 500 for the financial year.[143] Consequently, an approximate

138 *Id.* at 42.

139 Scanlan, *supra* note 61 at 18.

140 Directive 2014/95, of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups, 2014 O.J. (L 330) 1, 3.

141 *RIO+20 The Future We Want*, United Nations, https://sustainabledevelopment.un.org/partnerships/rio20 (last visited Apr. 13, 2022).

142 Directive 2014/95, of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups, 2014 O.J. (L 330) 1, 2.

143 *Id.* at 4.

of 11,700 large companies and groups across the E.U. must comply with this mandate.[144] According to this article , a non-financial statement must contain:

> [I]nformation to the extent necessary for an understanding of the undertaking's development, performance, position and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters, including:
> (a) a brief description of the undertaking's business model;
> (b) a description of the policies pursued by the undertaking in relation to those matters,
> including due diligence processes implemented;
> (c) the outcome of those policies;
> (d) the principal risks related to those matters linked to the undertaking's operations including, where relevant and proportionate, its business relationships, products or services which are likely to cause adverse impacts in those areas, and how the undertaking manages those risks;
> (e) non-financial key performance indicators relevant to the particular business.[145]

Considering these regulations, more pressure is placed on companies to abide by environmental and moral standards, while simultaneously providing more power on investors to make decisions that will drive change in the industry. The exertion of pressure by investors on companies is the best way to push corporate management to transform their business plans and strategies to conform to the demands of those who are willing to invest in them. This will not only impact a specific corporation, but the overall industry as well. "Financial institutions like public and private banks, pension, and investment funds, support industrial animal production with hundreds of billions of euros."[146] The influence that investors now hold over the industry does not go unnoticed as it is now also regulated by the European Union through the Capital Requirements Regulation (hereinafter, "C.R.R.") and the Capital Requirements Directive, which apply in all E.U. member states since the year 2014.[147] Per regulation, banks and investment firms are imposed the responsibility of treating climate risks and other risks related to sustainability with the same thoroughness

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144 *Corporate sustainability reporting*, Eur. Comm'n, https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en (last visited Jan. 5, 2022).

145 Directive 2014/95, 2014 O.J. (L 330) 1, 4-5.

146 Heinrich Böll Stiftung, *Meat Atlas 2021*, 11 (2021), https://friendsoftheearth.eu/wp-content/uploads/2021/09/MeatAtlas2021_final_web.pdf (last visited Jan. 5, 2022).

147 See Regulation (EU) No. 575/2013, of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No. 648/2012, 2013 O.J. (L 176) 1; Directive 2013/36, of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC, 2013 O.J. (L 176) 338.

as they approach other financial risks.[148] In response, the European Banking Authority (hereinafter, "E.B.A."), who is in charge of undertaking "policy work to promote transparency and enhanced public disclosures by financial institutions",[149] has implemented new policies to increase the efficiency of institutions disclosures. "[T]he [E.B.A.] aims to promote transparency on Environmental, Social or Governance ([E.S.G.]) risks, encouraging institutions to strengthen their management of these risks and promoting awareness of their key role in the transition to a green economy."[150] Some of the guidelines that the C.R.R. established for the disclosure of financial *and* non-financial disclosures include transparency about remuneration structures and associated risks, corporate governance arrangements, and "reporting proportionate to the nature, scale, and complexity of the activities of the institutions".[151]

Among the intricate plans, projects, covenants, and legislation that the E.U. has implemented to pressure corporations in their accountability regarding their sustainability strategies and environmental footprint, the Action Plan for financing sustainable growth, launched by the European Commission is one of the most interesting ones.[152] The plan lays out "a roadmap to encourage the private sector to better integrate sustainability requirements and to increase their sustainable investments."[153] Among those requirements is the one called *taxonomy*. To be fulfilled, it requires that an entity who is obligated "to publish non-financial information to include information on how and to what extent the undertaking's activities are associated with economic activities that qualify as environmentally sustainable."[154] This is an effort to require companies, to not just mention in an abstract manner that they are performing environmental sustainable economic activities, but to provide specific detailed information as to these assertions, making them more accountable and discouraging any sort of fraud or misinformation to stakeholders. The concept of taxonomy is based on the reporting of three main indicators:

> i) [T]he proportion of their turnover derived from products or services associated with economic activities that qualify as environmentally sustainable; ii) the proportion of their capital expenditure and if relevant iii) the proportion of their operating expenditure related to assets or processes associated with economic activities that qualify as environmentally sustainable.[155]

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148 *Stream A1 Assessment Report: EU Non-Financial Information Requirements Momentum and Coherence*, European Financial Reporting Advisory Group 24 (February 2021), https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FSiteAssets%2FEFRAG%2520PTF-NFRS_A1_FINAL.pdf&AspxAutoDetectCookieSupport=1.

149 *Id.*

150 *Id.*

151 *Id.* at 26.

152 *Commission Action Plan: Financing Sustainable Growth*, COM (2018) 97 final (Mar. 8, 2018), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0097.

153 *Stream A1 Assessment Report, supra* note 148, at 34-35.

154 *Id.* at 40.

155 *Id.*

The production of "processed products, resulting from the processing of meat or from the further processing of such processed products, so that the cut surface shows that the product no longer has the characteristics of fresh meat" is regulated by E.U. through *Regulation (EC) No 853/2004 of 29 April 2004 laying down specific hygiene rules for on the hygiene of foodstuffs* which elaborates a series of health and safety requirements to be followed in the process.[156] It is within this regulation that the E.U. defines the concept of meat and establishes the E.U.'s food policy that all producers must follow "from stable to table."[157] Besides the environmental aspect and plant protection focus that must be taken into consideration during the process, a particularity that distinguishes the E.U. is their focus on animal health and welfare.[158] It is clear that the main focus of the meat industry everywhere in the world is production, however, it is the emphasis that is placed on other important aspects of the process that demonstrate the social commitment a country has to its people. For example:

> The basics for European animal production comprising the foundation for the meat industry are based on the goal of breeding animals while maintaining respect and full protection of their health and welfare. European animal welfare policies strictly regulate areas associated with breeding as well as the transport and slaughtering of animals.
>
> . . . .
>
> In countries that are part of the European Community much focus is placed on the aspect of full traceability of food products. This means that each stage of production must be completely transparent. In farming, animals are marked at the time of birth, and their health and welfare are monitored until slaughter.[159]

Even though the states within the E.U. follow a well-developed framework to encourage corporate decisions based on environmental and sustainable strategies and to regulate the environmental footprint of meat processing and production, according to European stakeholders such as customers and employers, there is still more work to do.[160] Investors have also requested that the regulatory scope of non-financial reporting be extended beyond large companies.[161] Most recently, a revision to the Non-Financial Reporting Direc-

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156 Regulation (EC) No. 853/2004, of the European Parliament and the Council of 29 April 2004 on laying down specific hygiene rules for on the hygiene of foodstuffs, 2004 O.J. (L 139) 55, 93.

157 *European Standards*, MEATFROMEUROPE, https://www.meatfromeurope.eu/european-standards/?doing_wp_cron=1634518397.7955129146575927734375 (last visited April 13, 2022).

158 *Id.*

159 *Id.*

160 *See* Olivia Grégoire & Pascal Durand, *Non-Financial Performance is too Important a Matter to be Left to Financiers*, EURACTIV (February 19, 2021), https://www.euractiv.com/section/economy-jobs/opinion/non-financial-performance-is-too-important-a-matter-to-be-left-to-the-financiers/.

161 Simon Jessop & Kate Abnett, *Investors Urge EU to Beef up Firms' Environmental, Social Reporting rules*, REUTERS (June 23, 2020), https://www.reuters.com/article/us-europe-regulation-sustainable-finance-idUKKBN23U278.

tive (N.F.R.D.) was being developed in light of complaints have been raised that all companies, not just large companies, should be required to publish reports that demonstrate "environmental protection, value sharing and respect for human rights in their business activities."[162] This request for a more comprehensive approach to non-financial reporting is of much interest to citizens as it influences the environmental impact of companies. Additionally, the Global Reporting Initiative (hereinafter, "G.R.I."), which is the world's most widely used international organization for sustainability reporting, called for mandatory non-financial reporting in the E.U.[163] According to the Carol Adams, a professor of Accounting at Durham University Business School and a former chair of G.R.I.'s Stakeholder Council, "[t]ransparent disclosure will not occur unless [E.U.] reporting requirements are mandatory and enforced by a pro-active regulatory body with powers to require changes."[164] Additional requests from investors include: (1) disclosure of non-financial information in the annual management report; (2) strengthening of the social and governance aspects; (3) develop minimum mandatory reporting requirements; (4) building on existing reporting initiatives (to achieve comprehensive non-financial reporting); (5) keeping up the international role for reporting standards, and (6) ensuring legislative consistency and avoid duplication of reporting legislation.[165] In light of this new found awareness by investors, initiatives such as the Fair Animal Investment Risk & Return (hereinafter, "F.A.I.R.R.") have emerged.[166] F.A.I.R.R.'s goal is "to put factory farming on the [E.S.G.] agenda [by] claim[ing] that there are several risk that investors need to know and manage."[167] This initiative focuses on issues such as environmental sustainability and animal welfare while providing analysis in collaboration with industry experts and companies on meat sourcing, sustainable proteins, working conditions and sustainable aquaculture.[168]

Although it is far from perfect, the E.U. regulatory directives and laws related to meat production and processing are a step towards the right direction and should be taken as a framework to follow. The U.S. government must encourage transparency by requiring similar disclosures to provide economic stimuli to meat corporations. By taking these measures, accountability will be seen as a real necessity that must be fulfilled by corporate governance. There is no doubt that "[i]f governments fail to align economic stimulus with mitigation the climate emergency, climate risk will intensify, making clear sustainability reporting even more important."[169]

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162 *Id.*

163 Peter Paul van de Wijs, *Call for Mandatory non-Financial Reporting in EU — Built on GRI*, GRI (May 14, 2020), https://globalreportinginitiative.medium.com/call-for-mandatory-non-financial-reporting-in-eu-built-on-gri-5f83ab210743.

164 *Id.*

165 *Id.*; Kate Abnett & Simon Jessop, *Investors urge Europe to prioritise climate in agriculture reform*, Reuters (March 21, 2021), https://www.reuters.com/business/sustainable-business/investors-urge-europe-prioritise-climate-agriculture-reform-2021-03-22/; *The urgency for sustainable food production*, Triodos Investment Management, https://www.triodos-im.com/articles/2016/the-urgency-for-sustainable-food-production (last visited April 10, 2022).

166 FAIRR a Coller Initiative, https://www.fairr.org/ (last visited April 10, 2022).

167 *The urgency for sustainable food production*, Triodos Investment Management, https://www.triodos-im.com/articles/2016/the-urgency-for-sustainable-food-production (last visited April 10, 2022).

168 FAIRR a Coller Initiative, *supra* note 166.

169 Scanlan, *supra* note 61 at 19.

ii. The E.U.'s *Farm to Fork Strategy*

In 2019, the European Commission, as part of its European Green Deal proposal, introduced what they are calling a *Farm to Fork Strategy* as a response to the fundamental challenges currently plaguing the food system in the E.U..[170] The proposal's current slogan is "for a fair, healthy and environmentally-friendly food system."[171] This new component in agriculture focuses on tackling environmental challenges in the production of food and on making the E.U. "the world's first climate-neutral bloc."[172] General strategies of this proposal consist of cutting the overall use and risk of chemical pesticides by fifty percent, reducing nutrient losses by at least fifty percent, lowering by twenty percent the use of fertilizers in food production, and reducing by half food waste at retail and consumer levels.[173] The goal is to implement these changes by the year 2030.[174] This proposal focuses on reforming the complete food production process, this is because:

> One of the basic requirements in the [E.U.] is the possibility to track not only the origin of the raw material, but also the later stages of its processing and distribution . . . The *from stable to table* practice . . . makes it possible to trace the entire history of the product.[175]

Among the significant changes proposed by *Farm to Fork* is to reduce the colossal environmental damage caused by livestock, as well as the animal welfare violations caused.[176] Specifically, livestock's contribution to climate change including CO_2 emissions, massive deforestation for livestock farming land use, biodiversity loss, and pollution of land and waterways.[177]

The E.U. recognizes that "[c]urrent meat consumption patterns in Europe are unsustainable in terms of both health and the environment",[178] consequently, this proposal also includes addressing antimicrobial resistance linked in animals and humans caused by the "excessive and inappropriate use of antibiotics."[179] Public policy comes into play in *Farm to Fork* by focusing on the reduction of imported feed that relies on deforestation of land, promoting plant protein growth and consumption in Europe, cutting sales of microbials for livestock by half, and revising product labels for animal welfare.[180] Decisions such as re-

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170 *Farm to Fork Strategy*, EUR. COMM'N, https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_en (last visited Apr. 13, 2022).

171 *Id.*

172 Böll Stiftung, *supra* note 146, at 58.

173 *Id.*

174 *Id.*

175 *European Standards*, MEATFROMEUROPE, https://www.meatfromeurope.eu/european-standards/?doing_wp_cron=1634518397.7955129146575927734375 (last visited April 12, 2022).

176 *See* Dan Nosowitz, *Protection Plans*, MODERN FARMER (October 31, 2021), https://modernfarmer.com/2021/10/usda-eu-farm-to-fork-strategy/.

177 Böll Stiftung, *supra* note 146, at 58-59.

178 *Id.*

179 *Id.*

180 *Id.*

ducing the importation of feed and other products will require a change from the E.U. as to *how* they conduct international trade. Just like in the U.S., industrial livestock holds influence in public policy, and currently there are policies in place to facilitate the importation of cheap feeds.[181] International Trade Agreements between countries can also expand the size of the markets and thus, are seen as beneficial for the economy. Additionally, the revision of product labels for animal welfare will focus on revising animal welfare legislation on animal transport and slaughter, which is not only beneficial for the animals, but might also help reduce the possibility of zoonoses and the life-threatening risks suffered by those who work in this industry.[182] This strategy, as robust and intricate as it might sound, will depend on converting these proposals into an actual "legislative framework for sustainable food systems",[183] and arranging a reformation of public policies and regulations in the E.U. that will need to be implemented accordingly and rapidly.

Unfortunately, one of the main challenges that they face is the lack of support from the U.S., who has made clear that they do not agree with the *Farm to Fork Strategy*.[184] The U.S. and Europe have dueling visions on how to feed the world, as explained in an article by Politico, where Europe's *Farm to Fork* strategy is described as "America's chief bogeyman."[185] According to the U.S.D.A., "food production would drop by [eleven] percent and prices would shoot up [eighty-nine] percent if all countries followed the [*Farm to Fork*] model."[186] Tom Vilsack, the U.S. Agriculture Secretary, has made the following statements regarding the European Union's goals for 2030: "[t]here are a number of nations who believe strongly that we can't sacrifice productivity in order to reach a sustainability goal."[187] This model is contrary to the U.S. trade interest, which sees it as an additional barrier to trade their meat and food products with Europe. Standards are not uniform among countries, and food regulations are sometimes more stringent than in the U.S. Therefore, the implementation of this agricultural model across Europe could "result in some new trade barriers [between the U.S. and Europe] if they decide that the way they want to produce food is *the only [acceptable] way* [and only import] products that produce food the same way."[188] As usual, economic and productivity issues always reign over sustainability and environmental consciousness.

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181 *See EU-MERCOSUR Trade Agreement: A Preliminary Analysis*, Foreign Agricultural Service (January 7, 2021), https://www.fas.usda.gov/data/eu-mercosur-trade-agreement-preliminary-analysis, for a recent trade agreement with the Southern Common Market (or MERCOSUR) countries of Argentina, Brazil, Paraguay, and Uruguay that removes tariffs or creates tariff-rate quotas for key EU agricultural exports including low-cost feed for livestock.

182 *Id.*

183 *Farm to Fork Strategy, supra* note 170.

184 Nosowitz, *supra* note 176.

185 Eddy Wax & Emma Anderson, *The Transatlantic Relationship Descends Into a Food Fight*, Politico (September 29, 2021),
https://www.politico.eu/article/farm-to-fork-europe-united-states-food-agriculture-trade-climate-change/.

186 *Id.*

187 *Id.*

188 *Id.* (emphasis added).

iii. China's new safety food and advertising laws

Countries such as China, Japan and Taiwan, are one of the greatest contributors to environmental damage and resource depletion because of the large amount of demand that exists there for meat and meat products.[189] Specifically, China, because of how densely populated it is, produces and consumes an alarming large production of meat which accentuates the environmental and resources issues in the Asia region.[190] Research shows that from the period of 1996 to 2007 meat production in China increased by fifty percent.[191] Additionally, as a consequence of how limited the land in the country is for agriculture, China is one of the world's largest livestock feed-importing regions in the world.[192] Some of the greatest issues with production of meat in China and the rest of Asia are: (1) the intensive use of land for cultivated crop outputs for livestock; (2) the high rates of fertilizer application on the land which poses health risks when consuming the meat products or health risks related to the massive contamination of waterways; (3) the land intensification and geographical clustering of animals for meat products and dairy production, among others.[193] In 2009, it was found that forty percent of the land in China and Mongolia was used as grassland, equivalent to fifteen percent of the world's grasslands.[194]

To address some of these issues, especially those concerned with human health, China implemented new legislation in 2015. New labeling and traceability regulations and requirements were imposed on China's meat industry.[195] The *Food Safety Law* "[established] an expert committee of risk assessment on food safety consisting of experts with regard to medical science, agriculture, food, nutrition, biology, and the environment . . .." [196] The role of this expert committee would be risk assessment of food safety, including meat and meat products.[197] Compliance with the recent, more stringent regulations imposed related to food inspection, food import and export, and food safety incidents would be enforced on large and smaller-local meat plants and productors. Furthermore, this legislation provides a regulatory framework for the marketing and labeling of meat products including the prohibition of false and misleading advertising.[198] For example, the labeling of meat productions claiming that some meats provided nutritional advances for infants would

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189 John H. Dyck & Kenneth E. Nelson, *Structure of the Global Markets for Meat,* 785 Agriculture Information Bulletin 1, 4-5, https://www.ers.usda.gov/webdocs/publications/42513/30787_aib785_002.pdf?v=0 (last visited Apr. 13, 2022).

190 *Id.*

191 Banrie, *Livestock Resources and Environmental Issues in Asia*, The Poultry Site (March 19, 2013), https://www.thepoultrysite.com/articles/livestock-resources-and-environmental-issues-in-asia.

192 *Id.*

193 *Id.*

194 *Id.*

195 Mark Godfrey, *New laws put pressure on Chinese meat firms*, FoodNavigator-asi (October 5, 2015), https://www.foodnavigator-asia.com/Article/2015/10/05/New-laws-put-pressure-on-Chinese-meat-firms.

196 USDA Foreign Agricultural Service, China's Food Safety Law 6 (2015), https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Amended%20Food%20Safety%20Law%20of%20China_Beijing_China%20-%20Peoples%20Republic%20of_5-18-2015.pdf.

197 *Id.*

198 Godfrey, *supra* note 195.

require scientific proof of such statements.[199] Meat companies are also prohibited from using misleading or exaggerated terms such as *best*, *biggest,* or *leading*. For example, a leading meat company was coined from using the term "China's largest meat company."[200] As for food products sold online, they are required to disclose details as to product inputs and origins.[201] It is important to note, however, that even though these proposals help towards more transparency in the meat industry, requirements as to disclosure of antibiotics in these products have not been properly adapted due to industry resistance, an issue that is also occurring in the U.S.

iv. Current regulatory framework of the meat industry in the U.S.

Currently, there are various laws in the U.S. that regulate the meat industry in its different stages, from livestock farming, transportation of livestock to slaughterhouses, slaughtering, processing, packaging, labeling and consumption of the final product. It is important to take into consideration the fact that federal law in the U.S. divides food products and its processing sectors into two categories: (1) meat and poultry, and (2) all other food processors.[202] The meat and poultry category is regulated by the Food Safety Inspection Services (hereinafter, "F.S.I.S.") of the U.S.D.A.[203] Meanwhile, all other food processors are regulated and overseen by the Federal Food and Drug Administration (hereinafter, "F.D.A").[204]

As previously mentioned, the book *The Jungle* published in 1905, shed light on the horrific working and sanitary conditions of meat processing companies in the U.S.[205] This public exposure pressured Congress into the immediate enaction of laws that would regulate the meat industry and calm the public's uproar and concern. Consequently, the *Federal Meat Inspection Act* (hereinafter, "F.M.I.A.") was passed in 1906 with the purpose of making the adulteration and misbranding of meat and meat products sold as food illegal.[206] The F.M.I.A, which is currently mandated by the Food Safety and Inspection Service of the U.S.D.A., gave the federal government the power to inspect and condemn any meat product found unfit for human consumption and focused on "regulat[ing]commerce and protect[ing] the health and welfare of consumers."[207] Since its enactment in 1906, the regulatory standards set forth in F.M.I.A have grown along with the American meat industry.[208] The F.M.I.A. now regulates several of the following actions in the meat industry: (1) the inspection process; (2) the post mortem examination of carcasses, including

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199 *Id.*

200 *Id.*

201 *Id.*

202 *Regulation of the U.S. Food Processing Sector*, North Dakota State University, https://www.ag.ndsu.edu/foodlaw/safe-408-608/foodprocessingregulation (last visited January 4, 2022).

203 *Id.*

204 *Id.*

205 Sinclair, *supra* note 113.

206 Federal Meat Inspection Act, 21 U.S.C. §§ 601-95 (2022).

207 Animal Legal & Historical Center, https://www.animallaw.info/statute/us-meat-chapter-12-meat-inspection (last visited January 4, 2022).

208 *See* 21 U.S.C. §§ 601-95.

labeling and marking; (3) the destruction of condemned carcasses; (4) the inspection of carcasses brought into slaughtering or packing businesses, and of meat food products issued from and returned to said businesses; (5) the sanitary examination and regulation of slaughtering and packing establishments, and (6) the thorough inspection of animals and food products slaughtered and prepared during the night, among others.[209] These requirements also apply to products imported into the U.S.[210]

Simultaneously, the same day the F.M.I.A was put into place, in 1906, the *Pure Food and Drug Act* was also enacted, focusing primarily on consumer protection as well as granting the Federal government jurisdiction over food in interstate commerce.[211] Both of these guidelines provided for the adoption of manufacturing standards, such as the Good Manufacturing Standards, Low-Acid Canned Foods, Hazard Analysis Critical Control Points, and Preventive Controls regulations which have furthered food safety programs across the food and animal industries.[212] Unfortunately, these two statutes do not cover the hormones that are often injected into livestock or administered through food for the purpose of increasing the animal's weight and decreasing the wait time before the slaughter, thus enhancing productivity.[213] Such hormones have been linked to cancer, mostly in women.[214] Additionally, Xenoestrogens, a pesticide that has not been banned, "can lead to deleterious effects that potentiate a variety of neurological diseases starting from prenatal to post-menopause in women."[215]

In another effort to strengthen the transparency of the processes involved in food creation, Congress passed the *Agriculture Marketing Act* of 1946.[216] The Act sought "to carry out a number of programs which are importantly related to the food industry, not the least of which are the inspecting and grading of raw and processed foods, providing marketing information and assistance, and conducting research and development related to processed foods."[217] Most recently, the Senate announced a new bill called the *American Beef Labeling Act* which will seek to amend the *Agriculture Marketing Act* by establishing Mandatory Country of Origin Labeling (hereinafter, "M-COOL") requirements for beef

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209 *Id.* at §§ 603-04, 606-09.

210 *Id.* at § 620.

211 Pure Food and Drug Act, 34 Stat. 768 (1906).

212 Food and Drug Administration, 21 C.F.R. Parts 16, 225, 500, 507 & 579 (2021).

213 David S. Turk, *Detailed Discussion of Cattle Laws*, Animal Legal & Historical Center (2007), https://www.animallaw.info/article/detailed-discussion-cattle-laws; Leticia M. Diaz, *Hormone Replacement Therapy, or Just Eat More Meat: The Technological Hare vs. The Regulatory Tortoise*, 27 B.C. Envtl. Aff. L. Rev. 391-92 (2000), https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1229&context=ealr.

214 Leticia M. Diaz. *supra* note 214 at 392; see also, Barry James, *Hormone in U.S. Beef Causes Cancer, EU Scientists Conclude,* New York Times (May 4, 1999), https://www.nytimes.com/1999/05/04/news/hormone-in-us-beef-causes-cancer-eu-scientists-conclude.html#:~:text=BRUSSELS%E2%80%94%20A%20European%20Union%20scientific,a%20variety%20of%20health%20problems.

215 Varun Reddy et al., *Xenoestrogens impact brain estrogen receptor signaling during the female lifespan: A precursor to neurological disease?,* 163 Neurobiology of Disease 1 (2022), https://reader.elsevier.com/reader/sd/pii/S0969996121003454?token=7A9EEF219A908F9FD5E2991B3F02DEE4C38F8FB6281A372E2448BB785AA8CC1444CDB52A88942D7A55E9B1F0357BBFBC&originRegion=us-east-1&originCreation=20220413074908.

216 Agriculture Marketing Act of 1946, 7 U.S.C. §§ 1621-1639 (2022).

217 H.W. Schultz, *Agricultural Marketing Act of 1946*, Food Law Handbook 308 (1981), https://link.springer.com/chapter/10.1007/978-94-011-7373-5_19.

and a national voluntary labeling standard for bioengineered foods and other purposes.[218] According to lawmakers, this bill will allow for the prohibition of meat not born or raised in the U.S. to be labeled as a product of the U.S., thus focusing on the growth of the meat industry by supporting local ranchers and meat companies whose businesses have been directly affected by these imported products.[219] In accordance with the bill, U.S.D.A. required an investigation to be completed by the Food Safety and Inspection Service (F.S.I.S.), which regulates the labeling of meat.[220] It is important to mention that M-COOL labeling for beef and pork existed in the U.S. up until 2015 when it ceased after the World Trade Organization (hereinafter, "W.T.O.") ruled that M-COOL discriminated against imports of livestock from Canada and Mexico.[221]

Concerns over what we consume have often fueled the controversy around how we label our food. In the nineties' decade, these concerns, combined with a new focus on personal health, became more acute, paving the way for the *Nutrition Labeling and Education Act* of 1990,[222] which sought to amend the *Federal Food, Drug and Cosmetics Act* (F.F.D.C.A.).[223] Even though the *Nutrition Labeling and Education Act* did not have specific requirements as to the labeling of meat, it established parameters that had to be met when it came to branding and nutrition labeling food products.[224]

As for the transportation of animals, the *Twenty-Eight Hour Law* enacted in 1873, requires every vehicle transporting an animal for slaughter to stop every twenty-eight hours and provide feeding, water, and rest for the animal.[225] However, if the animal has access to both water and food within the transport, the requirements of this law are not applicable to the transporter.[226] Even though the *Twenty-Eight Hour Law* was originally created to safeguard the animal's welfare, it also affects the process of transforming the animal from living being to food. Ironically enough, the Law does not apply to birds such as chickens and turkeys; the most-farmed animals in the U.S.[227] Another law that affects this industry but is also geared more specifically towards animal welfare is the *Humane Slaughter Act* or the *Humane Methods of Livestock Slaughter Act*.[228] Passed in 1958 and then amended

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218 American Beef Labeling Act of 2021, S. 2716, 117th Cong. (2021).

219 Erica Shaffer, *Lawmakers to introduce mandatory COOL legislation*, Meat + Poultry (September 9, 2021), https://www.meatpoultry.com/articles/25484-lawmakers-to-introduce-mandatory-cool-legislation.

220 *Id.*

221 *Mandatory Country-of-Origin Labeling (M-COOL) for Beef Bill Officially Introduced (S. 2716)*, R-CALF-USA (September 17, 2021),
https://www.r-calfusa.com/mandatory-cool-for-beef-bill-officially-introduced-s-2716/.

222 Pub. L. No. 101-535, §§ 1-7 1990 (104 Stat. 2355) (codified in 21 U.S.C. §§ 301, 343, 343-1 (2022)).

223 Federal Food, Drug, and Cosmetic Act, 21 U.S.C. §§ 301-399i (2022).

224 *Id*. at § 343.

225 Twenty-Eight Hour Law, 49 U.S.C. § 80502(a) (2022).

226 *Id.* at § 80502(c).

227 Twenty-Eight Hour Law, Pub.L. no. 340-59, 34 Stat. 607, (first sentence of the bill was the following: "[a]n act *to prevent cruelty to animals* while in transit by railroad or other means of transportation from one State or Territory or the District of Columbia into or through another State or Territory or the District of Columbia . . .."); U.S. Department of Agriculture, The Twenty-Eight Hour Law Annotated 7 (1909), https://books.google.com.pr/books?id=i2LNAAAAMAAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false.

228 Humane Slaughter Act, 7 U.S.C. §§ 1901-1907 (2022).

in 1978, it requires that all animals raised for consumption in U.S.D.A. inspected slaughter plants be stunned into unconsciousness before slaughter to minimize pain.[229] Just like the Twenty-Eight Hour Law, the *Humane Slaughter Act* does not apply to chickens or turkeys.

Finally, it is important to keep in mind that the laws and regulations mentioned here are only federal. Each state in the U.S. has its own requirements for those interested in operating a meat slaughter or processing facility.[230] These regulations may range from health and sanitation to waste disposal, to specific facility or building requirements. As of today, twenty-seven states have state meat inspection programs, and their facilities must abide by both state and federal standards.[231]

B. Shift to sustainable practices in the market after the COVID-19 pandemic

According to the Department of Economic and Social Affairs of the United Nations, the significant economic impact of the COVID19 pandemic "may exert devastating long-run socio-economic effects, unless global policy responses can ensure a robust and sustainable recovery."[232] Such prospects, while negative, also present the opportunity for companies to reinvent themselves in more sustainable ways, focusing on environmental and health concerns while adding value to their product and brand. During the pandemic lockdown, most people were confined to their homes, forced to reflect on their daily choices, and restricted to relying on information from the media. This situation resulted in deeper inner reflection and a surge of awareness related to daily health, social and environmental struggles that plague modern society experiences. This shift in consumer perceptions and patterns poses an investment opportunity like no other for companies, especially when countries like the U.S. have approved considerable amounts of economic stimuli to boost the halted economy. In 2020, economists estimated that at least $10,000,000,000,000 might be needed to jumpstart the economy and by April of the same year the U.S. had already approved spending $3,000,000,000,000 in economic stimuli for businesses and individuals.[233] This provides an opportunity for livestock farmers, meat packaging and processing companies and meat related businesses to align their future business plans with the climate and health emergency and "jumpstart the economy in ways that promote ecological balance and healthy communities."[234]

Not only do consumption patterns need to change, but also meat packaging and processing companies in conjunction with livestock farmers must adopt a sustainable produc-

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229 *Id.* at §1902.

230 See Elizabeth R. Rumley & James Wilkerson, *Meat Processing Laws in the United States A State Compilation*, National Agriculture Law Center, https://nationalaglawcenter.org/state-compilations/meatprocessing/ (last accessed Apr. 13, 2022), for a comprehensive list of all state regulations and laws that govern the meat slaughter, packing and processing companies.

231 *Id.*

232 *World Economic Situation and Prospects: February 2021 Briefing No. 146*, Department of Economic and Social Affairs – United Nations (February 1, 2021), https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-february-2021-briefing-no-146/.

233 Scanlan, *supra* note 61 at 19.

234 *Id.*

tion strategy and business model that reduces grain-fed livestock farming, among other things. The goal of maintaining a steady flow of aliment without disruption must be a priority while also keeping in mind that the growing "demand must be fulfilled sustainably, and the mechanisms to achieve this are among the most often discussed issues within agriculture given concerns about climate change, resource use, animal welfare, antimicrobial resistance, and the provision of safe, affordable food."[235]

When it comes to understanding the extent of the financial and non-financial effect that the meat industry holds over society, it all comes down to education and proactive action. Every farmer and every industry involved in this process, from livestock farmers to retailers of the final product, must consider all these factors when making business decisions. Unfortunately, "the majority of producers, processors, and retailers are unable to understand and quantify the relative economic and environmental cost: benefit ratio of animal health practices [when engaging in production] and to therefore make informed management, sourcing, and price decisions."[236] For this to come to fruition, a significant change must drive demand and that change must be fueled by consumers and stakeholders of meat processing and packaging companies. In economic terms, the market responds to shifts in demand. Consumers must demand accountability from those involved in the chain of production for the financial and non-financial costs related to the final meat product found in stores. This might drive a significant change in overall sustainability across the board. We must consider that:

> It is crucial to ensure that the environmental and economic benefits of livestock production are understood by the public, such that threats to system resilience (e.g., animal welfare exposés or claims about negative environmental impacts) are negated, because dedication to improving sustainability has been clearly outlined, demonstrated, and communicated. The challenge to the industry is to adopt a culture of continuous improvement in driving forward sustainable intensification, encompassing improved health for animals, people, and the planet; to adopt both existing and new technologies; and to communicate dedication to improving sustainability to all food stakeholders.[237]

An increase in consumer knowledge as to the production of meat and its consequences, will undoubtedly result in enough stakeholder pressure to force the industry to engage in more sustainable practices.

C. Taxing hidden costs

The possibility of taxing the hidden costs of meat products has often been explored yet arduously rejected by the vast majority of the population and lawmakers. The environ-

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235 Capper, *supra* note 72 at 7.
236 *Id.* at 11.
237 *Id.* at 12.

mental, health and social costs of meat production may not appear to have any financial value presently but definitely will in the long run as their results will affect our daily lives significantly. "[I]f taxes are applied to animal proteins in an attempt to reduce consumption, [it could potentially] offer marketing opportunities based on improved animal welfare, environmental impacts, or nutritional quality."[238] Taxation, however, is frowned upon by the public and produces a negative image on the government which makes it harder to implement, as politics play a strong part in these kinds of decisions.

In 2020, members of the European Parliament discussed a meat sustainability charge proposal with a starting date in 2022.[239] In this proposal they would tax the purchase of beef, pork and chicken with the purpose of decreasing the meat consumption by an estimated seventy percent.[240] This tax would reflect the environmental costs associated with the production and distribution of meat including CO_2 emissions and biodiversity loss.[241] According to the True Animal Protein Price Coalition, "beef would have to be [forty percent] more expensive to pay for the climate damage caused by its production. Milk and other meats would need to increase in price by up to [twenty percent]."[242] This proposal received negative feedback from farmers who called the tax an "unbearable burden" and argued that "[i]ntroducing a tax on meat only in Europe would have a simple and direct effect, the relocation of our production to third countries that do not meet our animal welfare and environmental standards."[243]

Regardless of the challenges, it remains a good alternative but will require a strong-willed team of lawmakers that can come up with a solution where all interests would be balanced. They must be willing to implement these despite the backlash not just by the public, but by major meat industry leaders who hold significant power in political venues.

D. The flexitarian movement: Reducing meat consumption

A flexitarian, or semi-vegetarian diet is a trend that's on the rise that integrates vegetarian options into a meat and fish diet.[244] Every day more and more Americans are adopting this diet because it allows them to eliminate meat from a proportion of meals without excluding animal proteins altogether from their diet. "This will not occur overnight but may result from a series of incremental behavioral changes over time . . . ."[245] These changing eating habits have been occurring for the past years but have become more significant since the beginning of the COVID-19 pandemic. According to a survey of 2,000 Americans made by the New York Post, over half of Americans are consuming less animal-based

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238 *Id.* at 11-12.

239 Jane Byrne, *EU lawmarkers discuss sustainability charge on meat,* Feed Navigator (February 5, 2020), https://www.feednavigator.com/Article/2020/02/05/EU-lawmakers-discuss-sustainability-charge-on-meat.

240 *Id.*

241 *Id.*

242 *Id.*

243 *Id.*

244 David Zinczenko, *What is plant-based meat? Here are our top 10 product picks*, today (August 7, 2019), https://www.today.com/food/what-plant-based-meat-here-are-our-top-10-product-t160303.

245 Capper, *supra* note 72 at 11-12.

products while nearly six out of every ten are transitioning to a flexitarian diet since the COVID-19 pandemic began.[246] Hopefully, soon, consumers' changing habits will drive the food industry and the government to accept that diets does not have to rely so heavily on meat. The motivation in the changes in diet according to this survey were mostly driven by health-related reasons, animal welfare and cruelty concerns, and the desire to live a more sustainable lifestyle.[247]

E. Increase of plant-based meat substitute products in the market.

Substitutes for meat on the market which often *look like meat but aren't*, have mostly been made up of soy-based products which can be beneficial to health. Soy is even included in the United States Dietary Guidelines as a recommended food product for consumption.[248] Generally, straight-up soy products are a great form of protein for non-meat eaters as they contain amino acids and other important ingredients, however, their excessive consumption also poses health dangers.[249] Soy contains isoflavones —an estrogen-like compound—, used "typically [when food has] been processed and could contain additives".[250] Also, plant-based meats often have more sodium than meat-based products.[251] This is because on many occasions these products are made with an environmental responsibility and cruelty-free focus but not with the purpose of creating a healthier additive-free product. And, as we have exposed during this paper, these products need to move towards strategies that are socially and environmentally conscious, *and* healthier.

Most recently, the plant-based meat substitute market has encountered products like *Beyond Meat* and the *Impossible Burger* which simulate very closely the look, feel and taste of meat but are made with vegetables and other non-meat products.[252] These products are not necessarily a much healthier option than consuming meat, but their environmental footprint is significantly lower. For example, "Beyond Meat claimed it produces [fourteen] Beyond Burgers with the same amount of land it takes to produce one beef burger and 60,837 Beyond Burgers using the amount of water in an average swimming pool versus 312 beef burgers."[253] Meanwhile, the Impossible Burger, which has gone so far as being adopted as a meat-free whopper in Burger King restaurant chains, generates in its production eighty-seven percent less GHG, ninety-five percent less land, and use seventy-five percent

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246 Zoya Gervis, *Why more Americans chose to eat less meat during the pandemic*, New York Post (September 1, 2020), https://nypost.com/2020/09/01/why-more-americans-are-choosing-to-eat-less-meat/.

247 *Id.*

248 *See* U.S. Department of Agriculture and U.S. Department of Health and Human Services, *Dietary Guidelines for Americans, 2020-2025* 9th Edition, USDA (December, 2020), https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf.

249 Cory Stieg, *Are Meat Substitutes Bad For You Or What?*, Refinery 29 (January 2, 2019), https://www.refinery29.com/en-us/healthiest-meat-substitutes-for-vegetarian-diet.

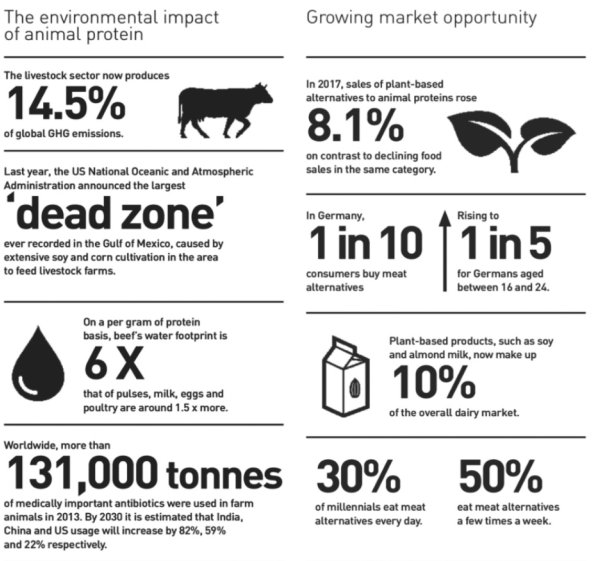
250 *Id.*

251 Zinczenko, *supra* note 245.

252 *Id.*

253 *Id.*

less water than regular burgers.[254] Below is a visual representation related to plant-based alternatives.



Graph 1: The environmental Impact of animal protein [255]

F. The cell-cultured meat alternative

New technologies are allowing the development of new products that might offer a less onerous alternative to meat consumption. The development of cell-cultured meat or as it is also referred to *clean meat* or *lab-grown meat*, has been gaining popularity among scientists, regulators, and consumers. Cell-cultured meat is:

> [A] food product that is derived from animal cells but grown and harvested by scientists in laboratories. [It] can come from any animal traditionally raised for consumption including beef, poultry, swine, and fish. The process for growing cell-cultured meat is complex: cells are either collected through the biopsy of a living animal or taken from one recently slaughtered. The cells are grown in multiple stages to differentiate and mature. While differentiation allows the meat to have distinct texture and cellular form—picture the marbling of a steak—maturation is more complex and

254 Michael Eisen, *How GMOs can save civilization (and probably already have)*, Impossible™, (March 16, 2018), https://www.impossiblefoods.com/blog/how-gmos-can-save-civilization-and-probably-already-have.

255 *Plant-Based Profits: Investment Risks and Opportunities in Sustainable Food Systems,* Fairr, https://www.fairr.org/article/plant-based-profits-investment-risks-opportunities-sustainable-food-systems/ (last visited January 5, 2022).

> expensive. Maturation requires the cells to be placed into a type of scaffolding, and to grow in a nutrient-rich broth complex enough to sustain life.[256]

There is much to do before this product is finally sold to consumers in regular markets, but its growth is promising. It is estimated that the global market for this product will be worth 572 million by 2025.[257] Even though its environmental and social benefits are significant since it would eliminate the raising of livestock, the extensive use of resources and the fact that it would reduce danger to human health since it is made under a sterile clean laboratory, this up and coming industry is currently facing much criticism and backlash by some animal welfare advocates who consider the practice to be non-ethical.[258] To put things into perspective, an analysis pertaining to the ethics of producing such meat-like products states that: "[i]n vitro meat is unique, though, in that no animals need be harmed at all. Nevertheless, . . . animals can be wronged without being harmed. It might be said that, even though no individual animals are harmed in the process of IVM, they are in fact disrespected."[259] This moral dilemma between the ethics of continuing to intervene with animals and doing it to avoid further abuse and exploitation from humans, is highlighted in the following statement:

> An animal's integrity is violated when through human intervention it is no longer whole or intact, if its species-specific balance is changed, or if it no longer has the capacity to sustain itself in an environment suitable to its species. However, when the intervention is directed toward the animal's own good, we do not speak of a violation of its integrity.[260]

Additionally, the meat sector, plant-based meat substitute sector, and others have demonstrated serious concerns about how these items would be labeled in the market.[261] The current debate is whether these products would be labeled as meat, plant-based products or an unknown alternative. For instance, the U.S. Cattlemen's Association, a lobbying organization composed by independent cattle producers,[262] requested that the Food Safe-

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256 Sarah Kettenmann & Bridget Lamb, *New Regulatory Frameworks for Cell-Cultured Meat*, ABA (April 1, 2020), https://www.americanbar.org/groups/environment_energy_resources/publications/natural_resources_environment/2019-20/spring/new-regulatory-frameworks-cellcultured-meat/ (citations omitted).

257 Andrew Sim, *Lab-Grown or Cultured Meat: Legal in Hong Kong and China?,* Baker McKenzie (February 16, 2021), https://viewpoints.bakermckenzie.com/post/102gqzg/lab-grown-or-cultured-meat-legal-in-hong-kong-and-china.

258 Emma Grey Ellis, *I'm a Vegetarian—Will I Eat Lab-Grown Meat?*, WIRED (Nov. 27, 2019), https://www.wired.com/story/vegetarian-ethics-lab-grown-meat/; Jo Adentuji, *Lab-grown meat could let humanity ignore a serious moral failing*, The Conversation (Dec. 14, 2017), https://theconversation.com/lab-grown-meat-could-let-humanity-ignore-a-serious-moral-failing-88909.

259 G. Owen Schaefer & Julian Savulescu, *The Ethics of Producing In Vitro Meat*, 31(2) Journal of applied philosophy 188, 192 (2014), https://onlinelibrary.wiley.com/doi/10.1111/japp.12056.

260 *Id.* (*citing* Bernice Bovenkerk et al., *Brave new birds: The use of animal integrity in animal ethics*, 32(1) The Hastings Center Report 16, 21 (2002), https://doi.org/10.2307/3528292).

261 Kettenmann & Lamb, *supra* note 257; Robert G. Hibbert & Amaru J. Sanchez, *Citizens Group Advocates Certain Limitations on Definitions of 'Beef' and 'Meat'*, XII(103) The National Law Review (March 23, 2018), https://www.natlawreview.com/article/citizens-group-advocates-certain-limitations-definitions-beef-and-meat.

262 Homepage, U.S. Cattlement's Association, https://uscattlemen.org/ (last visited April 13, 2022).

ty and Inspection Service establish certain meat and beef labeling requirements, including prohibiting any food product not derived from harvesting an animal from using the word 'beef' in its advertisement."[263] Also, some states have taken preemptive measures to make sure cell-cultured meat is not mislabeled. That is the case with Mississippi's recent law that bans the marketing of any plant-based or cell-cultured product as meat without this product being available for sale yet in the U.S.[264]

Even though various sectors have shown resistance to the development of this industry, countries are preparing their regulations for the unavoidable development of cell-cultured meat. Currently, the E.U., Singapore and the U.S. are working on developing regulatory frameworks to govern this industry.[265] Indeed, the F.D.A. and the U.S.D.A. made an agreement:

> [O]n a joint framework (2019) to regulate safety and labelling of cell-based meat throughout its lifecycle. In the [E.U.], the European Commission will govern "cultured meat" through its Novel Foods regulations (2018), which includes an application process and safety assessments. [Moreover], [t]he Singapore Food Agency has even gone ahead to approve the selling of "cultured meat" last year, issuing a list of requirements for the safety assessment of novel foods.[266]

Other countries find themselves pondering how to effectively approach these new industries. In Hong Kong for example, the implementation of such frameworks is less advanced since it is currently relying on and waiting on public policy decisions of countries like the U.S., or the E.U. regarding these new industries.[267]

G. Vegetarianism and Veganism

The option of a vegetarian or a vegan diet are two good alternatives to reducing meat consumption. According to the Academy of Nutrition and Dietetics, there are plenty of health benefits associated with adopting a vegetarian diet.[268] Lower risk of death from ischemic heart diseases, lower cholesterol levels, blood pressure and hypertension, a lower risk of type two diabetes and lower overall cancer and chronic disease rates are among these benefits.[269] In the past three decades, the rate of vegetarian and vegan friendly products availability in grocery stores have increased exponentially allowing this lifestyle to be easier to adapt to.[270] Despite a common misconception, meat consumption is not neces-

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263 Kettenmann & Lamb, *supra* note 257; Hibbert & Sanchez, *supra* note 262.

264 Kettenmann & Lamb, *supra* note 257; *see* Miss. Code § 75-35-15 (2019).

265 Sim, *supra* note 258.

266 *Id.*

267 *Id.*

268 Diana Kelly, *Is It Better to Be a Vegetarian?,* WebMD, https://www.webmd.com/diet/features/is-it-better-to-be-a-vegetarian#1 (last visit May 9, 2021).

269 *Id.*

270 Capper, *supra* note 72 at 11.

sary to obtain a sufficient intake of protein. However, vegetarians and vegans must keep in mind that a lack of animal foods does create a potential risk of vitamin B12 deficiency, thus supplementing for this micronutrient may be necessary.[271] In 2014, only one percent of Americans labeled themselves as vegan, but this has substantially increased to the point that most surveys estimate the vegan population right now ranging from two to six percent in the U.S.[272]

Conclusion: Things have gotten a bit better but there is still much work to do

As a response to new technologies and cost saving techniques to increase manufacturing and productivity, progress has been made regarding resource use and GHG emissions, but it has not been enough. These changes rather than been made with an environmentally conscious mind, have been done with an entrepreneur mindset based primarily on numbers and non-sustainable factors. Climate change is still upon us, and the environmental damage caused by livestock farming is devastating the Earth. "In 2014 alone, natural disasters took the lives of 18,000 people, affected nearly 107 million others, and caused 97 billion dollars in economic damages."[273]

Moreover, meat producing practices are inhumane, cruel and encourage animal abuse practices that should no longer be subsidized by the government and supported by consumers. Every day citizens are becoming more conscious about the consequences of their consumerism and the meat industry will no longer be able to hide behind the shield of necessity.

Finally, it is important to acknowledge the current context. The COVID-19 pandemic has revolutionized the world in both negative and positive ways. The pandemic and lockdown have somehow provided some sort of enlightenment attributed to our hyper-awareness of everything that is occurring around us through the media and social networks. People around the world have had to face the difficult reality of their lives and surroundings changing quickly, from one day to another. This has awakened our curiosity, our capacity for questioning what affects us, and our willingness to be more socially conscious. One of the things we have found ourselves questioning about our life is our diet choices due to health, environmental and cruelty concerns. We have also discussed in this paper how exposure to animal products have caused diseases and pandemics in the past that will continue as well in the future; the COVID19 outbreak made the world's population aware of this in a very abrupt manner. These times have also shed a light on the inhumane practices engaged in slaughterhouses and meat processing companies due to significant

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271 *Vitamin B12*, U.S. Department of Health & Human Services, https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/#:~:text=Vegans%20who%20consume%20no%20animal,foods%20%5B3%2C52%5D (last visit Apr. 13, 2022).

272 Bourassa, *supra* note 65.

273 Seenarine, *supra* note 13, at 2 (*citing* Sezin Tokar, *Bracing for El Niño: How USAID Is Helping Countries Prepare and Respond,* PreventionWeb (Oct 13, 2015), https://www.preventionweb.net/news/bracing-el-nino-how-usaid-helping-countries-prepare-and-respond).

COVID-19 outbreaks in these plants. Additionally, thousands of animals were sacrificed as production stopped due to outbreaks, and farmers found themselves with "no choice but to cull livestock as they [ran] short on space to house their animals or money to feed them, or both."[274] Thus, wasting the lives of animals who suffered their whole lifetime if only to be used for human consumption, and at the end were not, and unearthing of the fragility of our food system.

The meat food system is unstable, outdated and, damaging and needs to be reformed *immediately*. As the world population grows, only dietary shifts and market pressure will be enough to cause a real change. It is only through our actions that we will be able to provide the children of the Earth a world not ravaged by disease, abuse, malnutrition, and suffering. "Food is the single strongest lever to optimize human health and environmental sustainability on Earth."[275] Thus, no matter how much research is performed, how many studies are published, and how much information we are provided by experts about these issues and the possible solutions, meat consumption is part of our global diet and is engraved in our daily lives. It will take more than information about the environmental, economic and health impact its consumption causes, for society, as a whole, to change its consumption patterns and demand accountability, transparency and reformation from this industry. That is why in this case, unfortunately, knowledge alone is not the key; strong willfulness and groundbreaking action is.

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274 Tom Polansek, *Piglets aborted, chickens gassed as pandemic slams meat sector*, REUTERS (April 27, 2020), https://www.reuters.com/article/us-health-coronavirus-livestock-insight-idUSKCN2292YS.

275 *Healthy Diets From Sustainable Food Systems, Food Planet Health,* EAT-Lancet Commission 5, https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf (last visited Apr. 13, 2022).