

**Earthjustice \* Animal Legal Defense Fund \* Center for Biological Diversity \*  
Environmental Working Group \* Johns Hopkins Center for a Livable Future**

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***Re: Comments in Response to Advance Notice of Proposed Rulemaking Regarding  
Labeling of Meat or Poultry Products Comprised of or Containing Cultured  
Animal Cells, 86 Fed. Reg. 49,491, Docket No. FSIS-2020-0036 (Sept. 3, 2021)***

**Introduction**

On behalf of our millions of members and supporters across the country, the undersigned organizations submit these comments in response to the Food Safety and Inspection Service's ("FSIS") Advance Notice of Proposed Rulemaking regarding the Labeling of Meat or Poultry Products Comprised of or Containing Cultured Animal Cells, Fed. Reg. 49,491. We appreciate this opportunity to urge FSIS to center the climate crisis and environmental justice when considering requirements for cultured meat and poultry product labels. Given the potential climate, environmental, public health, and animal welfare benefits of cultured products, we urge FSIS to refrain from mandating labels for cultured products that could be confusing or perceived as derogatory. Additionally, FSIS should provide guidance for cultured meat and poultry producers who wish to make special claims about the environmental and climate benefits of their products.

Industrial slaughtered meat and poultry production are significant drivers of the climate crisis and cause grave public health and environmental harm that disproportionately impacts environmental justice communities. Animal-based food production is a leading source of anthropogenic methane and nitrous oxide emissions—especially potent greenhouse gases—and monopolizes vast tracts of land that would otherwise sequester and store carbon. Moreover, by generating pervasive toxic air and water pollution, meat and poultry production pose serious threats to public health and the environment. For example, overwhelming toxic ammonia and hydrogen sulfide air emissions and animal waste discharges into waterways cause death and serious illnesses. Across the country, from North Carolina to California, low-income communities and communities of color bear the brunt of these health and environmental harms.

Despite these climate, public health, and environmental harms, meat and poultry remain in high demand, jeopardizing our ability to meet crucial global climate targets and disproportionately burdening environmental justice communities. Cultured meat products—like other alternatives to conventional slaughtered meat—could meet consumer demand for meat and poultry at greatly reduced climate, public health, and environmental costs. While bioengineering and infrastructure hurdles might impose barriers to rapid and widespread availability of cultured products, labeling regulations should not. Like all food products, cultured meat and poultry products should be held to rigorous labeling standards that ensure transparency, accuracy, and

consumer protection. However, these products should also enter the market competing on a level playing field, free from mandates to carry confusing or derogatory labels, and with the benefit of agency guidance as to special claims about environmental and climate benefits.

## **I. Slaughtered Meat and Poultry Production Significantly Contribute to the Climate Crisis.**

Industrial animal agriculture is a major contributor to climate change.<sup>1</sup> The U.S. Environmental Protection Agency (“EPA”) has determined that direct agricultural production is responsible for 10% of the nation’s greenhouse gas emissions.<sup>2</sup> Of those emissions, about 80% come from animal agriculture, including beef, dairy, poultry, and pork production, as well as crop production for animal feed. Though meat and poultry production inflict numerous climate harms,<sup>3</sup> three particularly potent impacts bear emphasis when considering regulation of emerging alternatives: massive methane emissions, nitrous oxide emissions, and land use.

According to EPA, industrial animal agriculture is the country’s largest source of anthropogenic methane emissions.<sup>4</sup> These emissions are primarily caused by enteric fermentation, a process by which ruminants (largely cows and sheep) release methane into the atmosphere through belches and exhalation. They also result from manure management. Animal feeding operations generate gargantuan amounts of livestock waste; for example, pork production facilities in Iowa alone generate “a volume of waste equivalent to nearly 84 million people, more than the population of California, Texas, and Illinois combined.”<sup>5</sup> To manage this tremendous amount of waste, industrial livestock facilities generally store often large quantities of liquified manure in vast ponds known as “lagoons,” where the anaerobic conditions accelerate methane emissions. This liquified manure is then applied as fertilizer to nearby fields, often in quantities far greater than is necessary to adequately fertilize crops and beyond quantities that the crops can take in, thus leading to a host of environmental concerns, including nitrous oxide emissions.

EPA has concluded that these two processes—enteric fermentation and manure management—account for 36% of all U.S. methane emissions.<sup>6</sup> However, direct measurements

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<sup>1</sup> See Michael A. Clark et al., *Global Food System Emissions Could Preclude Achieving the 1.5° and 2°C Climate Change Targets*, 370 Sci. 705 (2020); see also Robert Lempert et al., Center for Climate & Energy Solutions, *Pathways to 2050: Alternative Scenarios for Decarbonizing the U.S. Economy* at 6, tbl.1, 21, & 30, tbl. AB-1 (2019), <https://www.c2es.org/wp-content/uploads/2019/05/pathways-to-2050-scenarios-for-decarbonizing-the-us-economy-final.pdf>.

<sup>2</sup> See EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2019* (2021), <https://www.epa.gov/sites/production/files/2021-04/documents/us-ghg-inventory-2021-main-text.pdf>. (last visited Oct. 13, 2021).

<sup>3</sup> See, e.g., Peter A. Lehner & Nathan A. Rosenberg, *Farming for our Future: The Science, Law, and Policy of Climate-Neutral Agriculture* 102 (2021) (describing agricultural emissions traceable to on-farm fuel combustion and electricity).

<sup>4</sup> See EPA, *supra* note 2.

<sup>5</sup> Charlie Mitchell & Austin Frerick, *The Hog Barons*, Vox (Apr. 19, 2021), <https://www.vox.com/the-highlight/22344953/iowa-select-jeff-hansen-pork-farming>.

<sup>6</sup> See EPA, *supra* note 2.

of emissions from animal agriculture facilities indicate that EPA's model estimates may be vastly undercounting, in some cases by as much as 90%.<sup>7</sup> Even assuming that EPA's figures are correct, these emissions are especially concerning due to methane's outsized global warming potential. Indeed, methane traps heat at approximately 84-86 times the rate of carbon dioxide during the first 20 years after it is emitted.<sup>8</sup> Accordingly, reducing methane emissions—which currently drive 25% of today's warming—will be key to slowing the rate of climate change.<sup>9</sup> For this reason, many researchers have concluded that reducing the climate impact from meat production will be essential to meeting global climate targets.<sup>10</sup>

Industrial animal agriculture also produces an enormous amount of nitrous oxide, a greenhouse gas that is approximately 300 times more potent than carbon dioxide.<sup>11</sup> Commodity crops grown for animal feed are produced by using large amounts of synthetic fertilizer, much of which is not taken up by plants. The excess fertilizer can run off into waterways and seep into groundwater. Nitrogen not taken up by plants is also converted by microorganisms to produce nitrous oxide. Manure from livestock facilities also emits substantial quantities of nitrous oxide, both when it is stored and handled in industrial facilities and when it is spread on fields as fertilizer beyond agronomic rates, which is often the case.<sup>12</sup> In total, agriculture is the country's largest source of nitrous oxide emissions, contributing at least 75% of all U.S. nitrous oxide emissions.<sup>13</sup>

In addition to these harmful emissions, meat and poultry production monopolizes disproportionate quantities of land that would otherwise sequester and store carbon. Even though humans only receive 30% of their calories from animal products, grazing and crop production for animal feed account for approximately 41% of land use in the contiguous United States—over *one billion* acres.<sup>14</sup> And this land use continues to rise: according to the poultry

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<sup>7</sup> See Matthew N. Hayek & Scot M. Miller, *Underestimates of Methane from Intensively Raised Animals Could Undermine Goals of Sustainable Development*, 16 Env't Rsch. Letters 063006 (2021). (comparing atmospheric measurements taken above and downwind from animal production regions to standard EPA models and finding that the measurements showed animal methane emissions were 39%–90% higher than model estimates)

<sup>8</sup> See Alexander J. Severinsky & Allen L. Sessoms, *Methane versus Carbon Dioxide: Mitigation Prospects*, 15 Int'l J. Env't & Ecological Eng'g 214, 215 (2021).

<sup>9</sup> See Env't Def. Fund, *Methane: A Crucial Opportunity in the Climate Fight*, <https://www.edf.org/climate/methane-crucial-opportunity-climate-fight> (last visited Oct. 1, 2021).

<sup>10</sup> See Marco Spriggin et al., *Options for Keeping the Food System Within Environmental Limits*, 562 Nature 519, 521 (2018).

<sup>11</sup> See Ula Chrobak, *The World's Forgotten Greenhouse Gas*, BBC (June 3, 2021), <https://www.bbc.com/future/article/20210603-nitrous-oxide-the-worlds-forgotten-greenhouse-gas>.

<sup>12</sup> See EPA, *supra* note 2; see also Ben Lilliston, *Latest Agriculture Emissions Data Show Rise of Factory Farms*, Inst. Agric. & Trade Pol'y (Mar. 26, 2019), <https://www.iatp.org/blog/201904/latest-agriculture-emissions-data-show-rise-factory-farms>.

<sup>13</sup> EPA, *supra* note 2.

<sup>14</sup> See Peter H. Lehner & Nathan A. Rosenberg, *Agriculture*, in *Legal Pathways to Deep Decarbonization in the United States* (Michael Gerrard & John C. Dernbach eds., 2019); see also Daniel P. Bigelow & Allison Borchers, U.S. Dep't of Agric., *Major Uses of Land in the United States, 2012*, at 4 tbl.1 (2017).

industry, land use for poultry production in the United States rose 5.4% over the last decade.<sup>15</sup> And, according to EPA, over the past 20 years, approximately 31.5 million acres of forests, grasslands, and wetlands have been converted to cropland, in large part to support animal feed production.<sup>16</sup> This conversion results in substantial carbon emissions: The overall flux of carbon from land conversion to croplands in 2019 was 54 million metric tons of carbon dioxide equivalents, making it the second largest anthropogenic land use change emissions flux in EPA's greenhouse gas inventory.<sup>17</sup>

Moreover, animal agriculture's increasing land use comes at a growing "carbon opportunity cost," as the land currently used for animal agriculture (including feed) could instead be devoted to ecological restoration or used in other ways that sequester and store carbon.<sup>18</sup> In fact, according to researchers, "the cumulative potential of carbon dioxide removal on land currently occupied by animal agriculture is comparable in order of magnitude to the past decade of global fossil fuel emissions."<sup>19</sup>

Plainly, then, efforts to reduce animal agriculture's methane and nitrous oxide emissions and land use must be incorporated into our broader efforts to combat climate change. Indeed, comprehensive estimates demonstrate that the agriculture industry is responsible for about a third of the United States' contribution to climate change, far more than EPA's greenhouse gas inventory suggests. (This larger figure incorporates, amongst other corrections: emissions that are directly attributable to agriculture but are currently counted elsewhere in EPA's inventory; a better assessment of agriculture's land use impacts; and use of a 20-year global warming potential, which more accurately conveys the climate impact of greenhouse gas emissions.<sup>20</sup>) Thus, absent significant changes to how slaughtered meat and poultry are produced, their production will continue to exacerbate the growing climate crisis.

## **II. Slaughtered Meat and Poultry Production Threaten Public Health and the Environment.**

In addition to inflicting devastating climate consequences, meat and poultry production pose grave threats to public health and the environment. Industrial animal agriculture causes significant amounts of toxic air pollution and is a leading source of water pollution that endangers drinking water and aquatic life throughout the country. As FSIS contemplates

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<sup>15</sup> See Nat'l Chicken Council, *2020 U.S. Broiler Chicken Industry Sustainability Report* at 20 (2021), [https://www.nationalchickencouncil.org/wp-content/uploads/2021/09/NCC\\_2020\\_Broiler-Chicken-Industry-Sustainability-Report.pdf](https://www.nationalchickencouncil.org/wp-content/uploads/2021/09/NCC_2020_Broiler-Chicken-Industry-Sustainability-Report.pdf).

<sup>16</sup> See EPA, *supra* note 2, at tbl. 6-5.

<sup>17</sup> *Id.* at 6-3.

<sup>18</sup> Matthew Hayek et al., *The Carbon Opportunity Cost of Animal-Sourced Food Production on Land*, 4 *Nature Sustainability* 21 (2021).

<sup>19</sup> *Id.*

<sup>20</sup> See Monica Crippa et al., *Food Systems Are Responsible for A Third of Global Anthropogenic GHG Emissions*, 2 *Nature Food* 198 (2021); see also Sonja J. Vermeulen et al., *Climate Change and Food Systems. Annual Review of Environment and Resources*, 37 *Ann. Rev. Env't & Res.* 195 (2012).

regulations pertaining to cultured products, it must consider these grievous harms from slaughtered products.

Industrial livestock facilities produce overwhelming amounts of toxic air pollution. Livestock production facilities, including the largest facilities known as concentrated animal feeding operations (CAFOs), are responsible for at least 60% of all ammonia emissions in the United States,<sup>21</sup> as well as vast quantities of hydrogen sulfide. Chronic exposure to even low levels of these toxic substances can lead to chronic illnesses (like headaches, coughing, diarrhea, and burning eyes<sup>22</sup>) and death.<sup>23</sup> In fact, recent research indicates that almost 13,000 deaths per year can be directly attributed to air pollution from animal-based food production facilities, often in low-income communities and communities of color.<sup>24</sup>

In addition to polluting the air in environmental justice communities, industrial animal agriculture facilities devastate waterways. The millions of pounds of animal waste generated by CAFOs contain numerous contaminants, including nitrogen, phosphorus, heavy metals (like zinc and copper), veterinary pharmaceuticals, hormones, and antibiotics.<sup>25</sup> CAFO “lagoons leak, on an annual basis, millions of gallons of manure,” dumping high levels of these contaminants into surrounding waterways, rendering them unsafe for recreational use and killing aquatic life.<sup>26</sup> Indeed, research has found that livestock waste management practices leave tens of thousands of rural residents at risk of ingesting contaminated drinking water.<sup>27</sup>

Not only is water contaminated by livestock manure sickening communities, but it also contributes to the growing crisis of antimicrobial resistance.<sup>28</sup> Industrial animal agriculture now accounts for approximately 80% of all antimicrobial use in the United States, as producers attempt to thwart the spread of disease in sprawling facilities housing thousands of tightly

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<sup>21</sup> See EPA, 2017 National Emissions Inventory Data, <https://enviro.epa.gov/enviro/nei.htm?pType=SECTOR&pReport=nation&pState=&pPollutant=&pPollutant=NH3&pSector=&pYear=2017&pCounty=&pTier=&pWho=NEI> (last visited Oct. 20, 2021).

<sup>22</sup> See Steve Wing & Susanne Wolf, *Intensive Livestock Operations, Health, and Quality of Life among Eastern North Carolina Residents*, 108 Env’t Health Persps. 233 (2000).

<sup>23</sup> See *Waterkeeper All. v. EPA*, 853 F.3d 527, 536 (D.C. Cir. 2017).

<sup>24</sup> See Nina G.G. Domingo et al., *Air Quality–related Health Damages of Food*, 118 Proc. Nat’l Acad. Sci. U.S. Am. e2013637118 (2021); Dick Heederik et al., *Health Effects of Airborne Exposures from Concentrated Animal Feeding Operations*, 115 Env’t Health Persp. 298 (2007).

<sup>25</sup> See Virginia T. Guidry et al., *Hydrogen Sulfide Concentrations at Three Middle Schools Near Industrial Livestock Facilities*, 27 J. Exposure Sci. & Env’t Epidemiology 167 (2017); see also Michael A. Mallin et al., *Industrial Swine and Poultry Production Causes Chronic Nutrient and Fecal Microbial Stream Pollution*, 226 Water, Air, Soil & Pollution 407 (2015).

<sup>26</sup> *Cnty. Ass’n for Restoration of the Env’t, Inc. v. Cow Palace, LLC*, 80 F. Supp. 3d 1180, 1196 (E.D. Wash. 2015).

<sup>27</sup> See Joann Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations On Water Quality*, 115 Env’t Health Persps. 308 (2007).

<sup>28</sup> See Ya He et al., *Antibiotic Resistance Genes from Livestock Waste: Occurrence, Dissemination, and Treatment*, 3 npj Clean Water (2020), <https://www.nature.com/articles/s41545-020-0051-0.pdf>; see also Frank Aaerestrup, *Get Pigs Off Antibiotics*, 486 Nature 465 (2012).

confined animals in squalid and unnatural conditions.<sup>29</sup> The explosion of antimicrobial use in the livestock industry is now considered a “a major factor driving the emergence of antimicrobial resistance globally.”<sup>30</sup> The Centers for Disease Control and Prevention report that each year, “at least 2.8 million people [in the United States] get an antibiotic-resistant infection, and more than 35,000 people die.”<sup>31</sup> According to the U.N., antibiotic-resistant diseases currently cause 700,000 deaths per year worldwide, a figure that could rise to 10 million by 2050.<sup>32</sup>

Water pollution from CAFOs impacts communities across the country. In the Chesapeake Bay region—the so-called “broiler belt”—poultry production facilities add “24 million pounds of nitrogen to the Chesapeake Bay every year,” which “is more nitrogen than from all of the urban and suburban stormwater runoff in Virginia and Maryland combined.”<sup>33</sup> In Iowa—a state dominated by pork production—officials have recently been forced to shutter half of the state’s public beaches due to water pollution from industrial animal production facilities.<sup>34</sup> And in California and North Carolina, researchers have documented dangerous levels of nitrate and ammonia in rural waterways, exposing thousands of low-income residents to water contamination.<sup>35</sup>

Thus, slaughtered meat and poultry production inflicts serious environmental harms with devastating public health consequences. Given that FSIS has long sought to “protect[] the public health by improving [FSIS’s] effectiveness as a public health regulatory agency,”<sup>36</sup> the agency must consider how labeling requirements could impede—or promote—the development of products with much lower impacts on public health, especially in environmental justice communities.

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<sup>29</sup> See Michael J. Martin et al., *Antibiotics Overuse in Animal Agriculture: A Call to Action for Health Care Providers*, 105 Am. J. Pub. Health 2409 (2015).

<sup>30</sup> Ellen Silbergeld et al., *Industrial Food Animal Production, Antimicrobial Resistance, and Human Health*, 29 Ann. Rev. Pub. Health 151, 162–63 (2008).

<sup>31</sup> *Antibiotic / Antimicrobial Resistance (AR / AMR)*, CDC, <https://www.cdc.gov/drugresistance/index.html> (last visited Oct. 12, 2021).

<sup>32</sup> See U.N. Interagency Coordination Group on Antimicrobial Resistance, *No Time to Wait: Securing the Future from Drug-resistant Infections* 1 (Apr. 2019), [https://www.who.int/docs/default-source/documents/no-time-to-wait-securing-the-future-from-drug-resistant-infections-en.pdf?sfvrsn=5b424d7\\_6](https://www.who.int/docs/default-source/documents/no-time-to-wait-securing-the-future-from-drug-resistant-infections-en.pdf?sfvrsn=5b424d7_6).

<sup>33</sup> Env’t Integrity Project, *Poultry Industry Pollution in the Chesapeake Bay Region* (Apr. 2020), <https://environmentalintegrity.org/wp-content/uploads/2020/04/EIP-Poultry-Report.pdf%20>.

<sup>34</sup> See Erin Jordan, *Half of Iowa State Park Beaches Had Swim Warnings in 2020*, Gazette (Sept. 17, 2020), <https://www.thegazette.com/news/half-of-iowa-state-park-beaches-had-swim-warnings-in-2020%20>.

<sup>35</sup> See U.S. Geological Surv., *Surface-Water Quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations* (2015), <https://pubs.usgs.gov/sir/2015/5080/pdf/sir2015-5080.pdf>.

<sup>36</sup> Food Safety & Inspection Serv., *A Public Health Approach to Processing Inspection*, 60 Fed. Reg. 30,683 (June 7, 2001).



### III. The Animal Agriculture Industry's Sustainability Claims are Unsupported and Inaccurate.

As FSIS contemplates labeling requirements for cultured meat and poultry products, the agency must cast a skeptical eye on claims that industrial animal agriculture will adequately address the climate crisis or deliver environmental justice. The industry's sustainability and climate mitigation claims are built on unsupported technical assertions and policy gimmicks, not commitments to move away from intensive and highly polluting practices.

Consider, for example, proposals to employ biodigesters on CAFOs to capture manure methane for use in biogas production. At the outset, manure methane accounts for only 25% of all agriculture methane emissions, while enteric fermentation is responsible for the bulk of agricultural methane emissions<sup>37</sup>; thus, mitigating manure methane emissions alone is a partial solution at best. However, incentivizing biodigestion of manure methane to produce biogas may in fact lead to increased emissions, as well as increased environmental and public health harms. By making methane profitable, digesters will incentivize greater production of it, and, at a minimum, eliminate any incentive to reduce methane generation through better manure management.<sup>38</sup> Biogas production will also lead to increased herd sizes, which in turn will increase enteric emissions of methane—emissions that are not captured by biodigesters. Digesters also do not address emissions of other greenhouse gases from livestock, such as nitrous oxide, which only stand to increase as production of biogas incentivizes greater herd size. Digesters have also been found to leak substantial amounts of methane, thus potentially increasing—rather than reducing—overall methane emissions if biogas production is incentivized.<sup>39</sup>

Additionally, greater herd size will increase the pollution and health risks that go along with greater manure production and that disproportionately harm vulnerable communities.<sup>40</sup> This includes noxious odors, toxic air emissions such as hydrogen sulfide and particulate matter, and surface and groundwater contamination, all affecting the communities surrounding these industrial facilities.<sup>41</sup> Digesters do nothing to ameliorate these harms, and making methane production profitable may in fact exacerbate a problem that some consider the greatest form of environmental racism in the nation.

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<sup>37</sup> EPA, *supra* note 2.

<sup>38</sup> See, e.g., Markus Lauer et al., *Making Money from Waste: The Economic Viability of Producing Biogas and Biomethane in the Idaho Dairy Industry*, 222 *Applied Energy* 621 (2018); Cal. Climate & Agric. Network, *Diversified Strategies for Reducing Methane Emissions from Dairy Operations* at 5 (2015), <https://calclimateag.org/wp-content/uploads/2015/11/Diversified-Strategies-for-Methane-in-Dairies-Oct.-2015.pdf> (“Another challenge posed by too great a focus on incentivizing dairy digesters is that, rather than avoiding methane generation altogether, these technologies can actually create incentives to generate methane from manure.”).

<sup>39</sup> See Phoebe Gittleson et al., *The False Promises of Biogas: Why Biogas Is an Environmental Justice Issue*, *Env't Just.* (2021).

<sup>40</sup> See Julia Kravchenko et al., *Mortality and Health Outcomes in North Carolina Communities Located in Close Proximity to Hog Concentrated Animal Feeding Operations*, 79 *N.C. Med. J.* 278 (2018).

<sup>41</sup> *Id.*

Similarly, feed additives are, at best, a partial solution to the animal agriculture industry's overwhelming methane emissions. To be sure, research has shown that additives like seaweed can, in some cases, reduce bovine methane emissions by up to 80%.<sup>42</sup> However, academics have also observed that the methane-reducing benefits of seaweed only occur on feedlots, where cows spend a mere 11% of their lifetime.<sup>43</sup> Additional research calls into question the long-term viability of seaweed additives, as cows' gut microbes may ultimately adapt in ways that would counteract seaweed's methane-inhibiting properties.<sup>44</sup> And even if seaweed could reliably reduce methane emissions, researchers at Pennsylvania State University have shown that harvesting enough seaweed to feed the entire United States cattle population would be both impracticable and environmentally destructive.<sup>45</sup> Thus, like other proposed technological tweaks, seaweed additives are far from a panacea.

Perhaps most concerning is the animal agriculture industry's heavy reliance on the purchase of carbon offsets or renewable energy credits to claim that their operations will achieve "net-zero" emissions.<sup>46</sup> Rather than reducing their own emissions to accomplish this goal, industrial meat and poultry companies promise to pay others to reduce emissions or to increase the amount of carbon stored in soil, and then take credit for the resulting greenhouse gas reductions. However, numerous technical problems plague agricultural carbon offsets: they are hard to measure and monitor,<sup>47</sup> by nature impermanent, and often based on over-simplistic science.<sup>48</sup> Moreover, reaching "zero" through offsets taints any claim that industrial animal agriculture *itself* is sustainable. At bottom, so long as industrial animal agriculture firms employ practices that emit massive amounts of greenhouse gases and tie up millions of acres of land, they will continue to significantly contribute to the climate crisis and continually threaten public health and the environment.

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<sup>42</sup> See Jan Dutkiewicz & Matthew Hayek, *Want Carbon-Neutral Cows? Algae Isn't the Answer*, Wired (Mar. 17, 2021), <https://www.wired.com/story/carbon-neutral-cows-algae/>.

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> Penn State, *Seaweed Feed Additive Cuts Livestock Methane but Poses Questions*, ScienceDaily (June 17, 2019), [www.sciencedaily.com/releases/2019/06/190617164642.htm](http://www.sciencedaily.com/releases/2019/06/190617164642.htm).

<sup>46</sup> Hillary Russ, *McDonald's Targets Net Zero Emissions by 2050, From Meat to Energy*, Reuters (Oct. 5, 2021), <https://www.reuters.com/business/sustainable-business/mcdonalds-targets-net-zero-emissions-by-2050-meat-energy-2021-10-04/> (noting that over 1,000 companies have announced "net-zero" by 2050 targets that rely heavily on purchasing offsets).

<sup>47</sup> See Ayina Anyachebelu, *Carbon Offsets Cannot Be Our Primary Solution to Climate Change*, U. Penn. Kleinman Ctr. Energy Pol'y (June 3, 2021), <https://kleinmanenergy.upenn.edu/news-insights/carbon-offsets-cannot-be-our-primary-solution-to-climate-change/> (citing a 2017 European Commission study "revealing that 85% of carbon offset projects under the UN's Clean Development Mechanism failed to reduce emissions").

<sup>48</sup> See Inst. Agric. & Trade Pol'y & Nat'l Family Farm Coal., *Why Carbon Markets Won't Work for Agriculture* (Feb. 4, 2020), <https://www.iatp.org/documents/why-carbon-markets-wont-work-agriculture> (noting that "soil carbon storage is extremely impermanent" because "any carbon sequestered in the soil can be released with a change in land management practices or through severe weather events").



#### **IV. If Demand for Meat and Poultry Products Remains High, Cultured Products May Offer Significant Climate, Public Health, Environmental, and Animal Welfare Benefits.**

Notwithstanding the dire climate, public health, and environmental impacts of slaughtered meat and poultry production, Americans' demand for meat and poultry remains high. In 2018, Americans consumed, on average, 222 pounds of red meat and chicken, one of the highest rates of consumption in the world.<sup>49</sup> In many ways, this is unsurprising: Foods like hamburgers and hotdogs have deep cultural significance, and are cheap and widely available.<sup>50</sup> Reducing meat and poultry consumption—and prioritizing healthful plant-based foods—remain important environmental and public health goals.<sup>51</sup> Indeed, the USDA's Dietary Guidelines make clear that, “[f]or most individuals, following a healthy eating pattern will require an increase in total vegetable intake.”<sup>52</sup> But to the extent meat and poultry products continue to be widely consumed, they must be produced in ways that minimize risks to climate, health, and the environment.

On this front, cultured products hold enormous promise. According to early life cycle assessments, cultured meat and poultry production is likely to require significantly less water than current slaughtered meat and poultry processes<sup>53</sup> while using very little land.<sup>54</sup>

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<sup>49</sup> See Ezra Klein, *Let's Launch a Moonshot for Meatless Meat*, The N.Y. Times (Apr. 24, 2021), <https://www.nytimes.com/2021/04/24/opinion/climate-change-meatless-meat.html>.

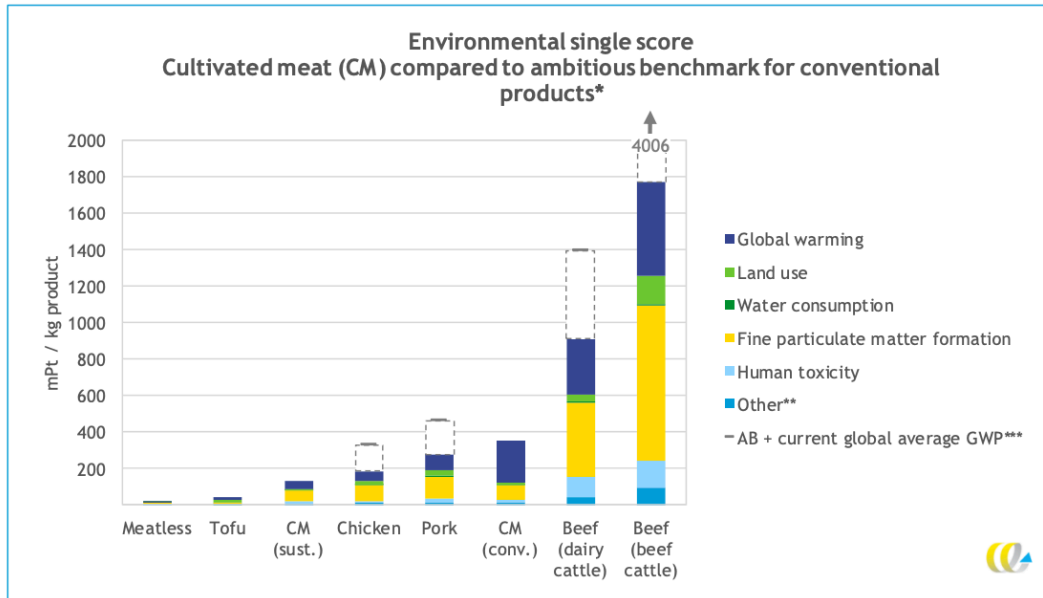
<sup>50</sup> See Angela Nguyen & Michael J. Platow, ‘I’ll Eat Meat Because That’s What We Do’: *The Role of National Norms and National Social Identification on Meat Eating*, 164 *Appetite* 105,287 (2021).

<sup>51</sup> See David Ludwig, *Technology, Diet, and the Burden of Chronic Disease*, 305 *JAMA* 1352, 1352 (2011); see also Carlos Augusto Monteiro et al., *Increasing Consumption of Ultra-Processed Foods and Likely Impact on Human Health: Evidence From Brazil*, 14 *Pub. Health Nutrition* 5, 7 (2010).

<sup>52</sup> U.S. Dep’t Agric., *Dietary Guidelines for Americans, 2020 – 2025*, at 31 (Dec. 2020), [https://www.dietaryguidelines.gov/sites/default/files/2021-03/Dietary\\_Guidelines\\_for\\_Americans-2020-2025.pdf](https://www.dietaryguidelines.gov/sites/default/files/2021-03/Dietary_Guidelines_for_Americans-2020-2025.pdf).

<sup>53</sup> Cf. Brian D. Richter et al., *Water Scarcity and Fish Imperilment Driven by Beef Production*, 3 *Nature Sustainability* 319, 320 (2020) (“[H]ydrologic modelling reveals that cattle-feed irrigation is the leading driver of [water] flow depletion in one-third of all western [United States] sub-watersheds,” and thus a significant driver of water scarcity).

<sup>54</sup> See, e.g., Pelle Sinke & Ingrid Odegard, *LCA of Cultivated Meat: Future Projections for Different Scenarios* 29–30, CE Delft (Feb. 2021), [https://cedelft.eu/wp-content/uploads/sites/2/2021/04/CE\\_Delft\\_190107\\_LCA\\_of\\_cultivated\\_meat\\_Def.pdf](https://cedelft.eu/wp-content/uploads/sites/2/2021/04/CE_Delft_190107_LCA_of_cultivated_meat_Def.pdf); Hanna L. Tuomisto & M. Joost Teixeira de Mattos, *Environmental Impacts of Cultured Meat Production*, 45 *Env’t Sci. & Tech.* 6117 (2011); Carolyn S. Mattick et al., *A Case for Systemic Environmental Analysis of Cultured Meat*, 14 *J. Integrative Agric.* 249, 252 (2015).



\* Intensive, West-European, circular agriculture with LUC-free soy.

\*\* 'Other' includes 14 impact categories, among which other toxicity categories, acidification and resource depletion. A complete list can be found in Annex A.

\*\*\* Current global average carbon footprint taken from Poore and Nemecek (2018). All other impact category scores are identical to the ambitious benchmark.

Source: Pelle Sinke & Ingrid Odegard, *LCA of Cultivated Meat: Future Projections for Different Scenarios* 29-30, CE Delft (Feb. 2021) (projecting that cultured meat production that employs sustainable energy sources will have a significantly lower global warming, land use, and water use impact than meat and poultry production).

In addition, unlike slaughtered animal agriculture practices, cultured meat and poultry production can more readily avoid over-use of antibiotics and their release into the environment, and thus will not contribute to growing antimicrobial resistance. And critically, cultured meat and poultry production will not generate billions of pounds of animal waste, thus avoiding emissions of staggering amounts of methane, nitrous oxide, ammonia, and hydrogen sulfide that harm the climate and pollute the air and waterways particularly in environmental justice communities. Cultured products, then, could meet consumer demand for products like hamburgers and hotdogs at a considerably reduced climate, public health, and environmental cost.

These products also hold the potential to greatly reduce animal suffering. According to USDA, approximately 9 billion animals are raised for food in the United States each year.<sup>55</sup> Overwhelmingly, these animals are raised in overcrowded conditions where they are unable to

<sup>55</sup> See U.S. Dep't Agric. Econ. Rsch. Serv., *Livestock & Meat Domestic Data*, <https://data.nal.usda.gov/dataset/livestock-meat-domestic-data> (last visited Oct. 13, 2021).

exhibit natural behaviors,<sup>56</sup> are subjected to painful mutilations,<sup>57</sup> and are slaughtered in processes that prioritize speed over safety.<sup>58</sup> Studies consistently demonstrate that American consumers are concerned about these pervasive conditions<sup>59</sup> and recently, voters have supported heightened welfare standards for farmed animals.<sup>60</sup> Thus, cultured products could serve an important purpose for many consumers, providing familiar meat and poultry products without “the large-scale breeding, housing, and slaughtering of animals.”<sup>61</sup>

To be sure, the burgeoning cultured products industry faces significant challenges. In order to produce cultured meat and poultry at scale, companies must overcome steep bioengineering and infrastructure hurdles, such as designing novel, giant bioreactors and building costly production facilities.<sup>62</sup> However, as with other nascent technologies, investment in research and development could precipitate necessary breakthroughs.<sup>63</sup> And given that other,

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<sup>56</sup> See generally Humane Society of the U.S., *An HSUS Report: The Welfare of Intensively Confined Animals in Battery Cages, Gestation Crates, and Veal Crates* (July 2012), <https://www.humanesociety.org/sites/default/files/docs/hsus-report-animal-welfare-of-intensively-confined-animals.pdf>.

<sup>57</sup> See, e.g., M. A. Sutherland et al., *Tail Docking in Pigs: Acute Physiological and Behavioural Responses*, 2 *Animal* 292 (2008).

<sup>58</sup> See *Farm Sanctuary v. U.S. Dep’t of Agric.*, No. 6:19-CV-06910, 2021 WL 2644068 (W.D.N.Y. June 28, 2021).

<sup>59</sup> See Cal. Dep’t of Food & Agric., Proposition 12 FAQs, [https://www.cdfa.ca.gov/AHFSS/pdfs/prop\\_12\\_faq.pdf](https://www.cdfa.ca.gov/AHFSS/pdfs/prop_12_faq.pdf) (last visited Oct. 13, 2021) (describing recently enacted California law that sets forth minimum requirements for housing egg-laying hens, veal calves, and breeding pigs).

<sup>60</sup> See, e.g., Am. Humane Ass’n, *Humane Heartland: Farm Animal Welfare Survey* (2013), <https://www.americanhumane.org/app/uploads/2013/08/humane-heartland-farm-animals-survey-results.pdf> (survey finding that 89% of respondents were “very concerned” about farm animal welfare); Jayson L. Lusk et al., *Consumer Perceptions for Farm Animal Welfare: Results of a Nationwide Telephone Survey* 13 (Okla. State Uni. Working Paper Aug. 17, 2007), <https://cratefreefuture.com/pdf/American%20Farm%20Bureau-Funded%20Poll.pdf>.

<sup>61</sup> See David Julian McClements, *Future Foods: How Modern Science is Transforming the Way We Eat* 337 (2019).

<sup>62</sup> See Joe Fassler, *Lab-grown Meat is Supposed to be Inevitable. The Science Tells a Different Story*, *The Counter* (Sept. 22, 2021), <https://thecounter.org/lab-grown-cultivated-meat-cost-at-scale/>.

<sup>63</sup> Cf. Elie Dolgin, *The Tangled History of mRNA Vaccines*, *Nature* (Sept. 14, 2021), <https://www.nature.com/articles/d41586-021-02483-w> (“For many years after [initial research] . . . mRNA was seen as too unstable and expensive to be used as a drug or a vaccine. Dozens of academic labs and companies worked on the idea, struggling with finding the right formula of fats and nucleic acids — the building blocks of mRNA vaccines.”); see also Paul Sonne, *How a Secretive Pentagon Agency Seeded the Ground for a Rapid Coronavirus Cure*, *The Wash. Post* (July 30, 2020), [https://www.washingtonpost.com/national-security/how-a-secretive-pentagon-agency-seeded-the-ground-for-a-rapid-coronavirus-cure/2020/07/30/ad1853c4-c778-11ea-a9d3-74640f25b953\\_story.html](https://www.washingtonpost.com/national-security/how-a-secretive-pentagon-agency-seeded-the-ground-for-a-rapid-coronavirus-cure/2020/07/30/ad1853c4-c778-11ea-a9d3-74640f25b953_story.html) (describing the U.S. government’s role in providing funding for mRNA research that led to the development of the COVID-19 vaccine); Isaac Nicholas & Mike Silver, *Tufts Receives \$10 Million Grant to Help Develop Cultivated Meat*, *TuftsNow* (Oct. 15, 2021), <https://now.tufts.edu/articles/tufts-receives-10-million-grant-help-develop-cultivated-meat> (describing USDA funding for interdisciplinary research about cultured products).

more sustainable forms of meat production, like rotational pasture-based systems, are unlikely to produce enough food to meet current levels of consumer demand,<sup>64</sup> alternatives to slaughtered meat are likely to play an important role in the transition away from the destructive practices of industrial animal agriculture.<sup>65</sup>

**V. FSIS Should Not Erect Unique Regulatory Barriers for Cultured Products and Should Provide Guidance as to Claims About Climate and Environmental Benefits.**

Product labels empower consumers to make healthful and socially conscious decisions.<sup>66</sup> For this reason, Congress has long authorized FSIS to protect consumers against false and misleading meat and poultry labels.<sup>67</sup> Especially in today’s marketplace, with consumers confronted by “a veritable barrage of labels,”<sup>68</sup> it is vitally important that FSIS and other regulators rigorously ensure that food products carry transparent, informative, and accurate information.<sup>69</sup> Accordingly, we urge FSIS to adopt a regulatory framework that appropriately scrutinizes *all* product labels—including those appearing on slaughtered meat and poultry products—especially when they make claims about environmental benefits.<sup>70</sup>

In addition, while we take no position on whether a specific term “should be in the product name of a food comprised of or containing cultured animal cells,”<sup>71</sup> given the potential benefits of cultured products—and the power of labels to shape consumer perceptions—we urge FSIS not to require cultured product labels to carry terms that may be confusing or perceived as

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<sup>64</sup> See Matthew N. Hayek & Rachael D Garrett, *Nationwide Shift to Grass-fed Beef Requires Larger Cattle Population*, 13 Env’t Rsch. Letters (2018) (concluding that “a nationwide shift to exclusively grass-fed beef would require increasing the national cattle herd from 77 to 100 million cattle” and “that the current pastureland grass resource can support only 27% of the current beef supply”).

<sup>65</sup> See Kate Aronoff, *Lab to Table*, New Republic (Sept. 29, 2021), <https://newrepublic.com/article/163554/lab-meat-save-planet>; see also Jan Dutkiewicz & Gabriel N. Rosenberg, *Man v food: Is Lab-grown Meat Really Going to Solve Our Nasty Agriculture Problem?*, The Guardian (Jul. 29, 2021), <https://www.theguardian.com/news/2021/jul/29/lab-grown-meat-factory-farms-industrial-agriculture-animals>.

<sup>66</sup> See Maïmouna Yokessa & Stephan Marette, *A Review of Eco-labels and their Economic Impact*, 13 Int’l Rev. Env’t & Res. Econ. 119 (2019).

<sup>67</sup> See, e.g., 21 U.S.C. § 601(n)(1); 9 CFR § 317.8(a) (prohibiting labels that convey “any false indication of origin”).

<sup>68</sup> Margot J. Pollans, *Eaters: Powerless by Design*, Mich. L. Rev. (forthcoming 2022) (manuscript at 34).

<sup>69</sup> Cf. Fed. Trade Comm’n, *Made in USA Labeling Rule*, 86 Fed. Reg. 37,022, 37,029 (July 14, 2021) (noting FSIS’s explanation that guidance permitting voluntary claims of “Product of USA” for imported beef products that are processed in the United States “may be misleading to consumers”).

<sup>70</sup> Cf. Andrew Jacobs, *Lawsuits Over ‘Misleading’ Food Labels Surge as Groups Cite Lax U.S. Oversight*, The N.Y. Times (Sep. 7, 2021), <https://www.nytimes.com/2021/09/07/science/food-labels-lawsuits.html> (describing the recent flurry of lawsuits alleging that “misleading labels . . . seek to profit off consumers’ growing interest in clean eating, animal welfare and environmentally friendly agriculture — but without making meaningful changes to [] farming and production practices.”).

<sup>71</sup> Food Safety Inspection Servs., *Labeling of Meat or Poultry Products Comprised of or Containing Cultured Animal Cells*, 86 Fed. Reg. 49,491, 49,495 (Sep. 3, 2021).

derogatory. And we urge FSIS to provide guidance for cultured meat and poultry companies who wish to make special claims regarding the relative benefits of their products.

Labeling requirements for cultured products may play a critical role in their early competitiveness. In fact, one study “demonstrated that the framing of cultured meat has a significant effect on many attitudes and beliefs about the product, as well as behavioral intentions toward it.”<sup>72</sup> Thus, particularly at this early stage, FSIS should avoid labeling mandates that could negatively impact consumer perceptions or negatively distinguish cultured products from slaughtered counterparts.<sup>73</sup> Such an approach would be wholly consistent with FSIS’s longstanding general principles for food standards, which prioritize “[e]stablishing regulations that do not stifle innovations in food technology and allow for technological alternatives and advancements in food processing.”<sup>74</sup> An even-handed approach is especially important where, as here, technological advancement could result in significant reductions in greenhouse gas emissions, air and water pollution, and resource use.

Similarly, to the extent cultured meat and poultry producers wish to make special claims about the relative climate, health, or environmental benefits of their products, FSIS regulation should be no more onerous than for slaughtered meat and poultry products. Under current regulations, meat and poultry labels with special claims—like those relating to environmental stewardship or animal welfare—are subject to a prior approval process for “claims, logos, trademarks, and other symbols on labels that are generally not defined in FSIS regulations or the Food Standards and Labeling Policy Book.”<sup>75</sup> To aid in the approval process, FSIS has provided guidance as to the documentation that is needed to support such claims, as well as examples of labeling language that comports with FSIS standards.<sup>76</sup> The agency should consider issuing similar guidance for cultured meat and poultry products in order to streamline these products’ path to the marketplace.

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<sup>72</sup> Christopher Bryant & Courtney Dillard, *The Impact of Framing on Acceptance of Cultured Meat*, *Frontiers Nutrition* (2019), <https://www.frontiersin.org/articles/10.3389/fnut.2019.00103/full>.

Recognizing the importance of food labeling, incumbent animal agriculture lobbying groups have played an instrumental role in the enactment of state laws—some of which have been struck down as unconstitutional—that seek to disadvantage nascent meat alternatives by restricting the legal definition of words like “beef” and “meat.” *See, e.g.*, Pollans, *supra* note 68, at 13 (collecting laws); Joshua Pitkoff, Note, *State Bans on Labeling for Alternative Meat Products: Free Speech and Consumer Protection*, 29 N.Y.U. Envtl. L.J. 297, 301 (2021). Similar federal legislation has been introduced in Congress. *See* Real Marketing Edible Artificials Truthfully Act of 2019, H.R. 4881, 116th Cong. (2019).

<sup>73</sup> *See* Sarah Garland & Jan Dutkiewicz, *What Should We Call Lab Meat? (Probably Not “Lab Meat.”)*, *New Republic* (Oct. 5, 2021), <https://newrepublic.com/article/163857/lab-meat-marketing-gmo-foods>.

<sup>74</sup> *See* Food Safety Inspection Servs., & Food & Drug Admin, Food Standards: General Principles and Food Standards Modernization, 70 Fed. Reg. 29,214, 29,222 (May 20, 2005).

<sup>75</sup> 9 CFR § 412.1(c)(3) & (e).

<sup>76</sup> *See* Food Safety Inspection Servs., Food Safety and Inspection Service Labeling Guideline on Documentation Needed to Substantiate Animal Raising Claims for Label Submission, 84 Fed. Reg. 71,359, 71,363 (Dec. 27, 2019).

## **Conclusion**

Slaughtered meat and poultry production inflicts severe damage on the climate, imperils public health, and threatens the environment. Overwhelming methane and nitrous oxide emissions and substantial land use push us further away from critical climate targets, while toxic air and water pollution cause death and serious illness predominantly in low-income communities and communities of color nationwide. Although cultured meat and poultry companies face technological challenges, their products could, in the coming years, provide significant climate, health, environmental, and animal welfare benefits. While we support greater regulatory scrutiny of all product labels, we urge FSIS to avoid imposing unique requirements that will competitively disadvantage the developing cultured products industry, and to instead enable cultured products to compete on a level playing field with slaughtered meat and poultry products. We also request that FSIS provide guidance regarding whether and how the industry can make climate, health, and environmental claims on its labels.

Respectfully submitted,

Earthjustice  
Animal Legal Defense Fund  
Center for Biological Diversity  
Environmental Working Group  
Johns Hopkins Center for a Livable Future