CHAPTER 4

The Animal Agriculture Industry's Role in Obstructing Climate Action

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INTRODUCTION: LIVESTOCK AND THE CLIMATE CRISIS

Collectively, the greenhouse gas (GHG) emissions of the fifteen largest meat and dairy companies exceed those of some carbon majors.[1] Several leading meat and dairy companies have made public commitments to becoming net zero in recent years, including Danone, Danish Crown, Nestlé, Tyson Foods, and JBS, the world's largest meat company.[2] Yet it is unclear how these companies will achieve their climate promises, and the lack of comprehensive data on their emissions and mitigation strategies impedes accountability and independent verification.[3] While the sector is highly heterogenous, ranging from small-scale famers and producers to transnational firms with integrated supply chains, it has become clear that many leading animal agribusiness actors in particular have contributed to efforts to influence the public's understanding of the livestock sector's role in the climate crisis and obstruct policy responses that threaten their ability to profit from business as usual.

Addressing the climate impacts of animal agriculture is critical to prevent catastrophic global heating. Even if fossil fuel use ended immediately, emissions related to food production alone are on course to push global warming beyond 1.5°C above preindustrial levels between 2051 to 2063.[4] Given the limited mitigation potential of technological measures alone, reducing the production and consumption of animal-based foods in high-consuming

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societies is necessary to meaningfully lower emissions.[5] Shifts toward more plant-based diets could contribute a significant proportion of the mitigation required to limit global warming to 2°C while maintaining food security and cobenefitting public health and biodiversity.[6]

Animal-based foods are responsible for an estimated 57% of food production emissions.[7] In 2006, the United Nations (UN) Food and Agriculture Organization (FAO) published *Livestock's Long Shadow*, the first global estimate of animal agriculture's contributions to anthropogenic climate change.[8] Since then, a multitude of studies have documented the significance of the sector's pollution,[9] estimating that it contributes between 11.2% and 19.6% of total global GHG emissions.[10] In the report, the FAO contended that the livestock sector "has such deep and wide-ranging environmental impacts that it should rank as one of the leading focuses for environmental policies" and warned that these environmental harms would worsen without "major corrective" measures.[11] Yet nearly two decades later, measures to effectively reduce livestock-related emissions are rarely at the forefront of climate policy. Animal agribusinesses operate within what the nonprofit Institute for Agriculture and Trade Policy (IATP) has termed an "accountability vacuum."[12] As documented in this chapter, available evidence suggests that industry actors have played key roles in keeping it that way.

Emissions related to animal-based food production derive from multiple sources. Cropland and grazing land that produce livestock feed are responsible for about 21% of the world's food production-based GHG emissions.[13] These emissions result from management activities, such as plowing fields (which reduces carbon storage), applying nitrogen fertilizer (nitrogen not taken up by crops runs off into waterways and gets broken down by microbes in the soil, releasing nitrogen oxide), and burning fossil fuel to run farm equipment.[14] Enteric fermentation from ruminant animals such as cows and sheep is also a leading source, representing about a fifth of total food production emissions, while manure management contributes about 2%.[15] Land-use changes that cause soil disturbance and biomass loss contribute an additional 12% of total food-production emissions.[16] Overall, livestock are estimated to emit about one-third of all human-caused methane emissions[17] and around half of human-caused nitrous oxide emissions.[18] The extensive acreage required to produce livestock and feed—which accounts for more than 80% of all land used for agriculture[19]—also incurs a significant and often uncounted "carbon opportunity cost" given the potential carbon that could be sequestered if ecosystems were restored on land used for livestock production.[20]

The livestock sector's emissions of methane, a highly potent but short-lived GHG, are particularly significant. According to the nonprofits IATP and Changing Markets Foundation, the fifteen largest meat and dairy corporations combined emit roughly 12.8 million tons (MT) of the GHG, representing around

3.4% of global anthropogenic methane emissions and 11.1% of all livestock-related methane.[21] A growing number of studies indicate that shifting to diets with fewer animal products would significantly reduce GHG emissions.[22] Similarly, the Intergovernmental Panel on Climate Change (IPCC)'s 2019 special report on climate change and land concluded that healthy and sustainable diets, underpinned by a focus on just agricultural transitions, present "major opportunities for reducing GHG emissions from food systems."[23]

Of the world's nations, China is the number one emitter of GHGs from meat and dairy production,[24] responsible for about 14% of global animal-based food production GHG emissions,[25] followed by Brazil (11%), the United States (8%), and India (7%).[26] Brazil, the United States, the European Union, Argentina, Canada, Australia, and New Zealand are all major meat and dairy exporters with high per capita meat and dairy consumption.[27] As a group, China and these so-called surplus protein exporters are responsible for the majority of global emissions from meat and dairy production[28] and host the headquarters of most of the world's largest animal agribusinesses.[29] Meat, dairy, and feed production are characterized by growing corporate concentration.[30] Globally, the top four agrochemical and animal pharmaceutical firms are estimated to receive 66% and 58% of sector revenues, respectively.[31] In the United States, 80% of soybean processing, 73% of beef processing, 67% of pork processing, and 54% of chicken processing are controlled by the top four firms.[32] Brazil-based JBS SA is the world's largest animal protein company by a large margin, with a daily slaughter capacity of 16,000 lambs, 75,000 cattle, 115,000 pigs, and 14 million poultry birds.[33] As described in this chapter, many of these companies have successfully leveraged their outsized market power for outsized political power, which they have used to maintain their social license to operate under business as usual.

Key to maintaining this license has been the industry's promise to reduce emissions, mainly by mitigating energy-related emissions through the use of renewables[34] (similar to oil and gas producers; see Chapter 2) or through technical interventions in production such as anaerobic digesters on manure lagoons to reduce waste, feed additives to decrease methane emitted by ruminant animals, and targeted measures aimed at improving animal productivity.[35] Global meat and dairy consumption is, however, projected to rise by 14% and 20%, respectively, by 2030 (compared with 2018–2020 averages)[36] and methane emissions are predicted to reach more than 140 MT annually by 2050 under current policies.[37] Although estimates for the mitigation potential of technical interventions vary significantly across studies—ranging from 4 MT to 42 MT per year[38]—it is evident that such measures are not sufficient to offset projected emissions increases.[39] Furthermore, while meat and dairy companies speak frequently about their interest in using methane-reducing feed additives, *Bloomberg* reported in 2023 that they are not following through on using available products at any significant scale.[40]

In this chapter, we examine the role of obstruction in creating and maintaining this unsustainable status quo. We aim to provide an overview of the evidence on the recent history of climate obstruction related to animal agriculture, followed by a synthesis of the narratives and practices constituting contemporary obstruction within the animal agriculture sector. We conclude the chapter with possible efforts to counteract obstruction and a research agenda.

A MODERN HISTORY OF ANIMAL AGRICULTURE CLIMATE OBSTRUCTION IN TOP-EMITTING REGIONS

The production and consumption of animal-based foods is shaped by a wide range of policies, from subsidies to crop insurance, national dietary guidelines, procurement, trade policy, climate policy, environmental regulations, and more. The net result of these policies is that the prices of industrially produced meat and dairy products in much of the world are artificially low, with their true costs externalized in the form of health and environmental harms.

Policy action at the scale needed to address livestock's impact on climate change remains rare. Efforts to date focus largely on tweaks around the edges of our current industrial food system and we have yet to see sustained policy action focused on transforming diets, setting binding GHG reduction targets for the agriculture sector, requiring comprehensive disclosure of emissions, regulating pollutants from industrial livestock operations, or transforming subsidy programs to cease incentivizing unsustainable levels of meat and dairy production. For example, neither recent US nor EU plans to address methane emissions include direct measures to regulate animal agriculture emissions, a major source of methane in both regions.[41] The Global Methane Pledge, spearheaded by the United States and European Union, commits to "achieve all feasible reductions in the energy and waste sectors" yet for agriculture, merely seeks to mitigate "emissions through technology innovation as well as incentives and partnerships with farmers."[42] An analysis of major US and EU policies from 2014 to 2020 found that public funding for animal-based farming exceeded $44 billion.[43] The few countries that have sought to address livestock emissions through policies such as taxes, the removal of environmentally harmful subsidies, binding emissions-reduction targets, and a shift toward more sustainable diets have met pushback and seen their policies weakened as a result. For example, in 2022, New Zealand—where agriculture accounts for almost half of the country's total emissions—proposed the world's first tax on cow emissions.[44] Following backlash from industry groups, the Labour government initially revised the proposal to keep the levy fixed at a lower rate for five years, but a change of government saw

the new center-right coalition scrap the policy altogether before it came into force.[45]

Box 4.1: RESPONSE TO *LIVESTOCK'S LONG SHADOW*

In 2006, the United Nations' FAO published *Livestock's Long Shadow*, a 390-page report that presented the first global estimate of the livestock sector's contributions to climate change and stated the need for measures to hold producers accountable for their environmental damage.

The publication put the livestock industry on the defensive. *Beef Today* described the report as "red meat for the vegetarian activists" and as "UN cover for their pre-existing bias."[46] Industry-funded groups' focus on climate-related messaging appears to have expanded significantly in the years that followed.[47] In 2009, the producer-funded Beef Checkoff program awarded a grant to an academic researcher at the University of California (UC) Davis, Dr. Frank Mitloehner, to assess the FAO's findings.[48] Mitloehner's critique did not focus on the report's empirical evidence, but rather criticized the authors' comparison of the emissions of the livestock sector to those of the transportation sector because the former included a full life-cycle analysis while the latter included only direct emissions.[49] Mitloehner's challenge to *Livestock's Long Shadow* was promoted in press releases, including by UC Davis ("Don't Blame Cows for Climate Change"[50]) and the American Chemical Society ("Eating less meat and dairy products won't have a major impact on global warming"[51]). Popular media outlets reported on Mitloehner's efforts to challenge the UN's findings as if the link between animal agriculture and climate change had been debunked.[52] In the years since, Mitloehner—who, according to his CV, has received more than $5 million in research funding throughout his career from industry groups—has continued to downplay the livestock industry's role in the climate crisis and is quoted regularly by the media as an expert on the climate emissions of livestock.[53]

Following the release of *Livestock's Long Shadow*, meat and dairy corporations and countries with major livestock industries—including Brazil, Argentina, Uruguay, Paraguay, the United States, and Australia—reportedly complained to the FAO.[54] In interviews with *The Guardian*, former FAO officials said they were "censored, sabotaged, undermined and victimized for more than a decade" and that attempts to further illuminate connections between livestock and climate change were discouraged and at times suppressed.[55]

The United States

Animal agribusiness involvement in climate obstruction in the United States dates back to at least the 1990s, when major agriculture industry groups worked hand-in-hand with other highly polluting industries to block policies aimed at reducing emissions. As *Inside Climate News* documented, the American Farm Bureau Federation (AFBF), among the nation's most powerful political lobbying groups, has derailed climate policy in the United States for more than four decades.[56] AFBF is a national tax-exempt nonprofit organization and lobbying group that leads a network of state-level Farm Bureau nonprofit organizations, some of which have affiliated for-profit companies that sell insurance. Many of the organization's 5.9 million members must pay dues as a condition of their insurance policies.[57] AFBF questioned the attribution of extreme weather to anthropogenic climate change as late as 2019,[58] and continued to oppose attempts to regulate or tax GHG emissions in 2023.[59] AFBF also opposes "any tie and/or connection" of climate-focused practices to federal crop insurance programs, as well as efforts to legislate mandatory cap-and-trade provisions and agricultural GHG emissions reporting.[60]

By the mid-1990s, AFBF was an active member of the Global Climate Coalition, an international lobbying group that opposed climate action and contested the science of global warming.[61] The Coalition spearheaded opposition to the 1997 Kyoto Protocol, which committed industrialized nations to limiting and reducing GHG emissions in accordance with set targets.[62] In a 1997 congressional hearing about the Protocol, AFBF's president argued against legally binding GHG emissions caps, stating that the science of climate change is "unclear that we even have a problem."[63]

In 2004, the US Environmental Protection Agency (EPA) launched a $15 million study to collect data to create methodologies to estimate livestock farm emissions, with the purpose of informing regulation of these facilities under federal air-pollution laws.[64] Major livestock industry trade associations funded the study in exchange for an agreement with the EPA, which granted participating farms immunity from civil action by the agency for the duration of the data- collection program, which was supposed to be completed in two years.[65] Nearly 14,000 farms, including 90% of the country's largest livestock farms at the time, received regulatory immunity through this agreement.[66] Ultimately, data was collected at only about two dozen farms, but all continue to receive regulatory immunity.[67] As of April 2023, the EPA had yet to publish any final methodologies resulting from the process.[68] Meanwhile, animal agribusiness groups—including the AFBF, state farm bureaus, the National Pork Producers Council, and the National Cattlemen's Beef Association (NCBA)—have lobbied the country's financial regulatory agency to protect them from new proposed emissions disclosure requirements[69] and backed a federal bill, the Protect

Farmers from the SEC Act, to prohibit the agency from requiring GHG disclosures for agricultural products.[70] Today, animal agriculture's GHG emissions in the United States remain effectively unregulated.

The European Union

With farming and agribusiness representing a powerful political force across Europe, recent EU efforts to shift to more sustainable production and consumption have encountered substantial opposition. A 2023 report by the European Commission's Group of Chief Scientific Advisors, for example, identified "evidence that some meat-industry representative bodies have influenced public discourse in order to counter scientific evidence on the negative impact of meat consumption on health and the climate."[71] The EU's 2020 Farm to Fork strategy promised reforms to align agricultural and food policy with environmental goals, including an acknowledgment that adopting "a more plant-based diet with less red and processed meat . . . will reduce not only risks of life threatening diseases, but also the environmental impact of the food system."[72] Efforts to do so have, however, stalled following opposition not only from some member states, conservative members of the European Parliament, and the agriculture sector, but also the European Commission's Directorate-General for Agriculture and Rural Development (DG AGRI).[73]

DG AGRI is the Directorate-General responsible for the EU Common Agricultural Policy (CAP), initiated in 1957 to ensure secure food supplies and support the livelihoods of European farmers. CAP supports emissions-intensive livestock farming and research has estimated that 82% of EU agricultural subsidies in 2013 were used to produce animal-based foods or animal feed.[74] Despite many reforms, scholars agree that the integration of environmental and climate concerns into the CAP has remained limited ever since. This inertia is due partly to a persisting discourse of agricultural exceptionalism, as well as the extensive access agricultural producers and traders have to decision-makers in the European Commission and Parliament.[75] In line with the primary focus of its mandate on ensuring agricultural production and food security, DG AGRI historically has been closely aligned with agricultural interests.

Copa-Cogeca, among the oldest and most-established EU lobby groups, formed soon after CAP in 1962, through the merger of two groups representing farmers and agri-cooperatives.[76] Together with other sectoral organizations such as the Liaison Centre for the Meat Processing Industry in the European Union and the European Feed Manufacturers Federation, they now form a coalition that responds specifically to growing concerns about Europe's high meat and dairy consumption. Launched in 2019 by eleven industry groups,

European Livestock Voice has been focused on defending the reputation of European meat as environmentally friendly and nutritionally essential.[77] Its *Meat the Facts* campaign website serves as a hub for the dissemination of news, opinion pieces, and resources in support of this goal.[78]

Despite superficial changes to reorient the CAP toward climate and environmental goals, for example through direct financial incentives to farmers,[79] meaningful action to address animal agriculture emissions remains limited. The EU's continued investment in promoting meat and dairy products has been criticized as standing at odds with its rhetoric on sustainable diets.[80] More than half of the 2016–2020 marketing funding under the CAP agricultural promotion program supported marketing for meat and dairy products, according to an analysis by Greenpeace Europe.[81] The Greenpeace report was met with claims that restricting funding for meat and dairy advertising would in fact harm EU environmental goals, as illustrated by European Livestock Voice's claim that it "feeds a kind of populism against the work put in place by the Commission and EU farmers to constantly improve the sustainability of EU agriculture."[82] A proposal to reform the promotion policy, due in early 2022, was blocked, according to an internal DG AGRI memo,[83] exemplifying tensions resulting from growing pressure on the Directorate to enact EU environmental commitments.

Within EU climate policy, agricultural GHG emissions also remain a major blind spot.[84] Provided with an opportunity to strengthen rules on emissions reporting and reduction through the 2024 revision of the EU Industrial Emissions Directive, EU decision-makers shied away from comprehensive action on livestock farming. While the legislative draft proposed to extend the Directive's scope to large cattle farms and lower inclusion thresholds for other livestock farms, the final Directive, negotiated amidst intensive lobbying and pressure from conservative political groups,[85] excludes cattle (pending a 2026 review) and weakens the proposed threshold for inclusion of pig and poultry farms.[86]

China

Over the past four decades, China's meat consumption and production have grown dramatically alongside increasing urbanization and rising income levels.[87] Today, China is not only the world's largest consumer meat market[88] but also the largest livestock producer[89] and importer of animal feed.[90] While the Chinese consume 27% of the world's meat, per capita intake—excluding fish—remains approximately half that of Americans.[91] Chinese demand for animal-based food and animal feed creates significant extraterritorial impacts. In New Zealand, for example, 15% of nitrogen and irrigation water use is

attributed to feed used for livestock products exported to China.[92] Similarly, China was the largest importer of Brazilian soy—a major animal feed crop—and responsible for 51% of CO_2 emissions embodied in the country's soy exports between 2010 and 2015.[93]

This enormous growth in production and consumption of animal products is conditioned by the country's "industrial meat regime" that emerged as part of China's late twentieth-century economic reforms: "a strategically managed set of policies, discourses, relations, and resources enacted with the goal of increasing commodity meat production, 'modern' forms of meat consumption, and agribusiness profits."[94] Food security is high on the Chinese government's agenda out of a concern for regime stability, and meat continues to symbolize the nation's progress against hunger.[95]

Chinese domestic meat production is concentrated in a small number of corporations, many of which are supported by the state.[96] These include WH Group Ltd., the world's largest producer of pork since its purchase of US-based Smithfield Foods in 2013, dairy giants China Mengniu Dairy Company Limited, Yili Group, and New Hope Liuhe Co., a leading producer of animal feed, swine, and poultry. As of 2021, five Chinese companies were listed in the top ten feed companies in the world ranked by volume.[97] State-owned COFCO—China Oil and Foodstuffs Corporation—is China's largest agriculture processor, manufacturer, and trader. COFCO plays a major role in the trade of soy and palm oil, two commodities central to the destruction of the world's rainforests.[98] An investigation by Global Witness and the Pulitzer Center found that COFCO was purchasing from deforesters in Brazil and Indonesia while simultaneously receiving sizable "green" loans from major Chinese and European banks.[99] Ironically, COFCO, as a trade agent of the Chinese government, has publicly pledged to pursue sustainable soy and palm oil sourcing.[100]

GHG emissions disclosure among Chinese meat and dairy companies is extremely limited.[101] Although Scope 3 emissions (emissions resulting from activities by assets not directly owned or controlled by the reporting organization, such as from supply chains) account for the majority of the sector's emissions, none of the twelve largest listed animal protein companies in China report them comprehensively or have a target to reduce them.[102] WH Group's Smithfield Foods has committed to become carbon negative by 2030, but includes only its US operations in this pledge.[103] Smithfield Foods' net-zero commitment further relies heavily on converting pig manure into methane gas, which is then sold as "renewable natural gas," a term some critics have called greenwashing.[104]

In its Nationally Determined Contribution submitted ahead of the 2021 UN Climate Change Conference (COP26),[105] China pledged to reach peak emissions by 2030 and noted plans to reduce emissions from food production overall, but did not include plans to reduce animal-based food consumption

or production.[106] At times, the Chinese government has recognized the need to reduce meat and dairy consumption: a 2016 semi-official dietary guideline, for instance, recommended a 50% reduction in animal protein intake.[107] Yet the government has continued to support the interests of industrial meat producers, notably by setting ambitious growth targets for the livestock and feed sectors in China's 2021–2025 Five-Year Plan for animal agriculture.[108] Currently, there is little available evidence to assess whether and to what extent climate obstruction within China comes directly from agribusinesses.

Brazil

Brazil's agricultural GHG emissions have grown more than 160% since 1970.[109] As of 2023, Brazil is the world's number-one producer and exporter of soybeans, number-two producer and number-one exporter of beef and chicken, and the world's leading exporter of corn.[110] Its growth in livestock and feed production is considered the main driver of deforestation, land degradation, and forest fires in biodiversity hotspots and carbon sinks including the Amazon rainforest and the Cerrado savanna.[111] Government policy, shaped by close proximity with the agribusiness sector, has led to a continued expansion of livestock and feed production in the Amazon region even after the 2015 Paris Agreement.[112]

Since 2000, Brazil's leading meat-processing companies—most notably JBS, Marfrig, and Minerva[113]—have grown dramatically in terms of both size and concentration of power.[114] This is due in part to the Brazilian National Development Bank's "national champions" policy, which actively supported internationalization by offering subsidized loans and purchasing shares and debentures of selected companies from 2007 to 2013.[115] This government funding heavily benefited large Brazilian meatpacking companies, including JBS and Marfrig.[116]

A pro-agribusiness, cross-party voting bloc within the Brazilian government, Frente Parlamentar da Agropecuária (FPA) has been a central force in promoting the dismantling of environmental protections.[117] As of 2023, more than half of the seats within the Chamber of Deputies and Federal Senate are affiliated with FPA. This ruralist coalition, financed at least in part through food industry conglomerates, is supported by the think tank Instituto Pensar Agro (IPA), which emerged in 2011 as an informal coalition between agricultural representatives from Mato Grosso and some members of Congress.[118]

De Olho nos Ruralistas, a Brazilian agribusiness watchdog, reports that the growth of IPA—especially in the last decade—catalyzed the industry's consolidation of influence and increased its political power. The IPA-FPA coalition provided a space in which Brazil's agricultural elites—including old and new

agricultural associations together with domestic and international multinational corporations[119]—could reconcile internal divisions to present a united front at the Congress and Senate.[120] It has done so through an increasing flow of resources and newfound strategic focus, allowing for the swift construction of joint business-parliamentary positions.[121] The IPA-FPA coalition has, for example, opposed the demarcation of Indigenous territories and the creation of conservation units.[122] Moreover, the FPA's submission of Bill PL 3729/2004, as part of a trio of environmentally detrimental legislation referred to as the "destruction package" by Brazilian NGOs and civil society, risks weakening environmental licensing requirements.[123] In addition to these collective efforts, individual companies reportedly benefit from significant access to key officials, facilitated by a revolving door whereby corporate employees transition to government posts and vice-versa.[124]

An analysis of Brazilian newspapers' climate coverage from 2002 to 2010 found that climate change was generally framed as an energy problem, even though the country's energy emissions are relatively small compared with its land use and agriculture emissions. The study found that discussions of meat production in the context of climate change were marginal—in the case of some leading newspapers, less than 0.5% of climate coverage mentioned meat—and often minimized the role of the meat industry in the climate crisis.[125]

POLITICAL AIMS AND STRATEGIES

In the next sections we detail common narratives that represent forms of obstruction in the context of animal agriculture and the practices actors use to disseminate these narratives. We divide practices into those aimed at (1) influencing policy and politics, (2) shaping science and public perceptions, and (3) building supportive coalitions.

Common Narratives

The climate impacts of animal agriculture are scientifically well-established, but the livestock industry continues to contest the scale, severity, and very existence of this problem. A key obstruction strategy is the creation of doubt about and controversy over evidence of the negative impacts of animal agribusiness. Narratives deployed to obstruct action to mitigate animal agriculture's climate impacts have positioned undesired interventions as unscientific, ineffective, or harmful. Notably, shifting the parameters of the debate toward technical interventions—away from measures such as herd size reduction or dietary change—is a powerful, subtle way to maintain the

status quo. While some of these narratives include overt denialism, the majority of arguments are presented as seemingly objective scientific critiques or constructive proposals for better, science-based solutions. In the section that follows we summarize key narratives employed to counter progress toward addressing the climate impacts of livestock production[126] and briefly discuss them in light of current evidence.

"Animal Agriculture's Contributions to the Climate Crisis Are Uncertain or Overstated"

This narrative includes claims such as (1) there is no scientific consensus on the climate impacts of livestock, (2) fossil fuels are the real problem and deserve sole blame for climate change, and (3) biogenic methane from livestock is different—and less of a problem—than methane from fossil fuel sources. The IPCC does assign fossil fuel methane emissions slightly higher metric values than biogenic methane emissions (29.8 vs. 27.2 for their respective global warming potential over one hundred years, or GWP100) because the CO_2 produced by the breakdown of fossil methane is considered additional.[127] This difference is, however, relatively minimal. As discussed in the introduction, livestock farming is estimated to contribute 11.2% to 19.6% of total global GHG emissions. With methane being a short-lived but potent GHG, it has an important impact on peak warming and the feasibility of remaining within internationally agreed temperature limits.[128]

"Livestock Production Is Essential and/or Good for the Climate"

The narrative that animal agriculture and its outputs are necessary for people and the planet is used to justify business as usual, undermining attempts to hold producers accountable for their climate impacts. It positions the continuation of animal-based food production at current rates as essential for (1) food security and nutrition, (2) economic growth and farmer livelihoods, and (3) responsible environmental stewardship (by emphasizing that animals sequester carbon on grazed land, benefit soil quality, and/or serve as upcyclers of human food byproducts). Related marketing of meat as "green" or "climate friendly"—such as Brazen Beef, a product from Tyson Foods' Climate-Smart Beef Program[129]—may serve to alleviate consumer concerns about high levels of meat consumption.

Livestock companies are also promoting the message that biogas from industrial livestock farms is an important source of renewable energy.[130] The industry has embraced opportunities to profit related to climate change, such as by selling soil carbon-offset credits, even though questions of how much carbon can be sequestered in soil and for how long are yet to be resolved.[131]

While food systems play an important role in climate mitigation and adaptation, shifts toward more healthful, plant-based diets have been identified as a key option for reducing GHG emissions while maintaining food security.[132]

"Any Climate Impacts of Animal Agriculture Can Be Addressed Through Technical Fixes"

This narrative claim accepts that livestock farming affects the climate to some extent, but suggests those impacts can be mitigated without reducing animal-foods production and consumption through (1) changes in livestock farming methods, and/or (2) technological interventions such as seaweed in cattle feed and anaerobic digesters.[133] Claims that technological interventions will effectively address the climate impacts of livestock are unfoundedly optimistic, largely unproven at scale, and stand at odds with high-level assessments that conclude that such measures alone are not sufficient without demand reduction.[134] Such claims often rely on their lower emissions *intensity*, even where *total* emissions are predicted to increase with higher production levels. Changes to farming practices—for example, switching from grain-finishing feedlot systems to exclusively pasture-based beef production systems—are not only infeasible at current consumption levels, but also unlikely to meaningfully mitigate the climate impacts of livestock production.[135]

"Regulating Livestock Emissions and/or Animal-Source Food Consumption Is Unnecessary and/or Infeasible"

This narrative revolves around claims that undesired interventions will negatively affect (1) farmers' livelihoods, (2) food security and nutrition, and (3) climate and the environment.[136] In this context, agribusiness is positioned as an ally to farmers, governments, and civil society in tackling these issues. The claim that regulation is not necessary often hinges on the argument that agribusinesses are already voluntarily and proactively taking sufficient action to reduce their own emissions, or that technical interventions suffice.[137] However, reducing production and consumption of meat and dairy, particularly in high-consuming, wealthy nations, is considered essential to meet climate goals,[138] and adapting our food system to climate change will require a shift toward lower-impact food production.[139]

"Proponents of Reduced Animal-Source Food Consumption and/or Livestock Emissions Regulation Are Misguided or Extremist"

Focusing on discrediting the messenger, this narrative positions those who support policies to reduce livestock emissions either as (1) unscientific and

ideologically driven or (2) unrealistic.[140] Claims that those supporting such measures act from a place of emotion and ideology—as opposed to the science-based approach of animal agribusiness and its allies—serve to undermine trust pre-emptively. Some evidence-based calls to adopt more sustainable diets are undermined using a straw-man argument implying that entire populations would be forced into vegetarianism or veganism, invoking animal-based food consumption as a cultural norm and animal farming as important cultural heritage.

Common Practices for Influencing Policy and Politics

As noted above, actors with an interest in maintaining or expanding industrial livestock production have impeded progress toward a more sustainable food system, including by keeping reduced production and consumption off policy agendas. In national and subnational settings, agribusinesses have lobbied, made campaign donations, and formally participated in policy processes with the aim to counteract progress on climate mitigation. Research using US lobbying reports, for instance, found that between 2000 and 2019, the ten largest US-based meat and dairy companies spent a combined $109 million on lobbying activities and $26 million on donations to federal political candidates.[141] The dairy industry also stood out as one of the most active sectors in lobbying around Canada's Healthy Eating Strategy, a roadmap for government action on more healthful diets.[142] Though empirical investigations of agribusiness's political obstruction remain rare, it is clear that livestock-related measures found in major initiatives such as the US Farm Bill, the EU Industrial Emissions Directive, and New Zealand's proposal to tax cattle emissions have been subjected to pressure from animal agribusiness and allied interests.

Investigative reporting suggests that obstruction has contributed to the striking neglect of livestock's climate impacts, and the mitigation potential of sustainable diets, within global climate and food governance. Following the Paris Agreement, the presence of the livestock sector in global climate governance has grown consistently, with 120 meat and dairy delegates—triple the number from the previous year—counted at the 28th UN Climate Change Conference.[143] The summit, held in 2023, was hailed as the first "food COP," where 134 nations pledged to transform food systems to address, and adapt to, climate change.[144] Livestock industry groups reacted positively to the COP28 outcomes, welcoming the emphasis on production efficiency over reduced consumption.[145] COP28 was accompanied by the launch of an FAO roadmap to address the climate crisis and end hunger.[146] Described as a "music to our ears" by a livestock industry representative,[147] the roadmap emphasized the high GHG emissions associated with animal agriculture but

omits from its list of 120 recommendations any interventions to reduce meat production and consumption.[148] An accompanying FAO study has been accused by scientists of using cherry-picked and misrepresented evidence that served to underestimate the mitigation potential of reduced meat consumption.[149] This follows accusations by former FAO staff of the UN agency "censoring and sabotaging their work when it challenged livestock industry positions."[150]

The lack of global ambition on cutting livestock-related emissions and the limitations inherent in inviting the same companies contributing to a problem to develop its solutions were illustrated by the outcome of the 2021 UN Food Systems Summit. The Summit, which aimed to drive food-systems transformation to achieve the organization's Sustainable Development Goals, concluded without a clear message on meat reduction.[151] A draft paper prepared by industry representatives who formed the Summit's "sustainable livestock" cluster promoted intensified production, prompting criticism by scientists and NGOs. Following the ad-hoc addition to the cluster of several independent experts, a compromise solution ultimately saw three position papers published on livestock, only one of which mentioned reduced consumption.[152] More widely, the Summit was seen to reflect a depoliticized approach to food systems transformation that prioritizes corporate-friendly, technological interventions and fails to problematize corporate power in food systems.[153]

Pressure by member states—which, unlike companies, have formal powers in intergovernmental decision-making—is central to efforts within the UN system to obstruct the inclusion of targets and recommendations perceived as threatening to animal agriculture. This influence was illustrated by, for example, reports that messages supporting a shift toward more plant-based diets were removed from the Summary for Policymakers and main report of the IPPC Sixth Assessment Report mitigation working group under pressure from Brazil and Argentina, countries with strong cattle and feed industries and correspondingly influential lobbies.[154]

Common Practices for Shaping Science, Evidence for Policy, and Public Perceptions

Practices aimed at shaping science, the translation of evidence into policy, and public opinion play an instrumental role in the obstruction of efforts to mitigate animal agriculture's climate impacts, serving to undermine the case for action and support alternative narratives.

Influencing the Conduct, Publication, and Interpretation of Science

In response to growing concern about the climate impacts of livestock production, animal agribusiness has increased its sponsorship of research and

scholarship. Industry-funded academics have repeatedly challenged or downplayed the scientific evidence establishing the livestock industry's role in the climate crisis (Boxes 4.1 and 4.2).[155] Initial livestock industry funding of individual academics and climate-related research has, in recent years, been followed by much larger investments in researchers and university centers—such as the UC Davis's Clarity and Leadership for Environmental Awareness and Research (CLEAR) Center and AgNext at Colorado State University—whose activities include promoting industry-supported climate solutions and producing policy analyses aligned with industry interests.[156] In 2022, an investigative journalist published documents showing that the CLEAR Center had been formed from an agreement between UC Davis and the Institute for Feed Education & Research (IFEEDER), an arm of the American Feed Industry Association[157] whose members include many major animal agriculture companies.[158] The documents indicated that CLEAR's industry funders "considered its greatest benefit to be its ability—as an apparently independent, academically credible voice—to make a positive case to the wider world about meat and dairy's environmental impact."[159] Although commercial partnerships are common in agricultural research, the risks this poses are illustrated by cases where undue influence is publicly documented. The Danish Centre for Food and Agriculture at the University of Aarhus, for example, withdrew a 2019 report on the climate impacts of beef after it emerged that Danish Crown and an industry association had cowritten it.[160]

The debunking of independent scientific consensus is a powerful strategy to obstruct climate action, if we follow the argument that consensus is a more crucial foundation for policy action than the quantity and quality of available evidence.[161] One way of undermining an emerging consensus, then, is to foster the appearance of an *alternative* consensus, illustrated by the Dublin Declaration of Scientists on the Societal Role of Livestock. Launched in 2022 and re-published in a 2023 special issue of the academic journal *Animal Frontiers*, the Declaration describes the livestock industry as "too precious to society to become the victim of simplification, reductionism, or zealotry."[162] The statement—which was coordinated by agribusiness consultants and reportedly signed by more than one thousand scientists—was endorsed by the EU Commissioner for Agriculture and shared with EU officials in an effort to prevent the adoption of ambitious environmental policies.[163]

Box 4.2: THE USDA-LAND-GRANT COMPLEX

During the first presidential administration of Donald Trump (2017–2021), the US Department of Agriculture (USDA) suppressed the term "climate change" in its communications and research reports.[164]

Continued

Box 4.2: CONTINUED

This minimization of the science and urgency of climate change to advance a political agenda was not an exception but rather a manifestation of the agency's long-standing role in promoting climate denial, and, more broadly, boosting unsustainable agricultural practices.

In the United States, deep ties between agribusiness, federal agencies, and the research community are strong and well-established.[165] Land-grant universities and their extension arms are tightly linked to the USDA via funding channels, joint appointments, revolving doors, and co-location of labs.[166] This *USDA-land-grant complex* played a key role in the development of the biological, mechanical, and organizational innovations that formed the basis for the dramatic growth in concentrated animal feeding operations (CAFOs).[167] Yet researchers at USDA and land-grant universities who helped develop these technologies paid little attention to their environmental effects.

USDA-administered public funding and conservation farm bill programs continue to be used to subsidize livestock production, perhaps most notably through feed-crop subsidies, supplying livestock producers with feed at a price below the cost of production.[168] The Environmental Quality Incentive Program, the largest USDA-funded conservation program, is required by the US Farm Bill to use 50% of its funding for livestock.[169] However, the NGO Environmental Working Group found that little of the funding from such programs supported practices the USDA considers climate-smart and "some of the practices that received the most funding actually exacerbate the climate crisis."[170] Thus, US federal policies to mitigate agricultural GHG emissions, particularly from livestock, are based on voluntary, subsidized, and often ineffective or counterproductive practices.[171]

A recent example of how public money administered by USDA has been used to obfuscate the climate impacts of livestock while purporting to address them is the funding of $3.1 billion Climate Smart Commodities public–private partnerships.[172] The agency has not released specific and detailed information on the beneficiaries of the funding beyond heavily redacted grant agreements and has refused to fulfill public record requests for information on how the money will be spent to protect "trade secrets and commercial or financial information."[173] Project summaries show that projects involving beef and dairy products alone account for over $1.3 billion in funding and involve companies such as Land O'Lakes, Tyson Foods, Archer-Daniels-Midland Company, and Cargill. The program lacks both a standardized methodology to assess GHG emissions and standardized implementation monitoring.[174]

Such actions are not new. The 2008 Farm Bill included a provision to exempt from Freedom of Information Act requests, and de facto shield

from public view and researchers' analysis, georeferenced USDA information regarding farm payments.[175] In 2011, the industry shut down a proposed rule that would have required CAFOs to report basic information to USDA; as a result, there is no national database on CAFO locations, nor the pollution they generate.[176] High-profile USDA supporters from both parties continue to argue that current policies are sustainable and efficient.[177]

Influencing the Use of Science in Decision-Making: Metrics and Measurement

The choice of metrics for attributing responsibility is inherently political. How we measure the climate impacts of meat and dairy products has implications for both how responsibility for climate change is understood and how it is addressed by public policies. In the context of livestock, an alternative metric to the commonly used GWP100—GWP*—has been embraced by animal agribusinesses operating in countries with historically large herd sizes.[178] While GWP100 reports entities' contributions to total global emissions according to their current emissions, GWP* places more emphasis on methane's shorter lifespan and "considers an entity's contribution to be its additions to its own baseline, as measured in a past year."[179] As a result, the use of GWP* can result in proportionally greater animal farming CO_2-equivalent (CO_2e) emissions being attributed to developing countries with historically low emissions but growing herd sizes, while countries with historically high emissions but stable or declining herd sizes benefit.[180]

Influencing Media and Public Perception

Growing attention to the environmental impacts of meat and dairy has been met with public relations campaigns such as Meat and Dairy Facts (Ireland), the European Livestock Voice's Meat the Facts, as well as the US National Cattlemen's Beef Association (NCBA)'s BeefUp Sustainability and Masters of Beef Advocacy programs.[181] In response to the Beyond Beef campaign, which encouraged people to halve their meat consumption, the NCBA responded with a countercampaign and the development of an elementary school curriculum that emphasized cattle ranchers as stewards of the environment.[182] It further questioned "the USDA's commitment to US farmers and ranchers" after the agency's employee newsletter endorsed Meatless Mondays in 2012,[183] calling the effort an "animal rights extremist campaign to ultimately end meat consumption."[184] The USDA subsequently removed the post and said it did not support Meatless Mondays.[185]

Media organizations have played a key role in shaping public perception by amplifying industry messaging.[186] More broadly, a now substantial body

of peer-reviewed articles analyzing media coverage of the livestock-climate connection indicates that media coverage has often focused on consumer responsibility and choice rather than corporate responsibility and policy change.[187] In practice, this emphasis means that much coverage of agriculture and climate change is concerned with meat-eating, veganism, or vegetarianism as individual dietary choices, whereas it rarely features livestock corporations' contributions to climate change and the role of government policies—taxes and farm subsidies, for example—in promoting or hindering sustainable production and consumption. An analysis by Faunalytics of one thousand climate-related articles in top US media outlets in 2021 and 2022 found that only 7% mentioned animal agriculture and fewer discussed its contributions to the climate crisis.[188] This paucity is reflected in limited public understanding of livestock's climate impacts.[189] For example, more than one in five polled Americans do not think that meat and dairy production contributes at all to global warming, and more than one in five said they do not know.[190]

Coalition Building and Management

Efforts to obstruct mitigation of the climate impacts of animal agriculture involve a wide range of actors, extending beyond those directly involved in the production or sale of animal-based foods to other commercial actors from adjacent industries including public relations, lobbying, media, finance, and industry-supported nonprofit organizations.

Business and trade associations unite companies across sectors or regions, playing a crucial role in coordinating and representing policy positions. In the context of livestock, such groups include, for example, the European Livestock and Meat Trades Union, the Istituto Salumi Italiani Tutelati, Beef+Lamb New Zealand, and the Global Dairy Platform. In recent years, animal protein groups have formed new industry organizations that focus specifically on climate-related messaging. For example, in 2021, the Meat Institute (previously the North American Meat Institute) and more than a dozen supporting companies and industry groups formed Protein PACT (for People, Animals & Climate of Tomorrow), which promotes "animal agriculture at the center of global solutions."[191]

Farmers occupy a pivotal role within food politics, and disaffected agrarian communities are a driving force behind right-wing populist pressure against policies aimed at reducing agriculture's climate impacts (see Box 4.3). A powerful political force in regions with high agricultural production, some groups with the power to mobilize the political capital of farming, such as Copa-Cogeca, have been a prominent voice in opposition to tougher climate policies.

Box 4.3: THE DUTCH NITROGEN CRISIS

On October 1, 2019, a caravan of tractors blocked more than a thousand kilometers of highway in the Netherlands as they traveled into the capital, The Hague. Their anger had been sparked by a proposal issued by the Dutch green-liberal party Democrats 66 to halve the national livestock herd to address nitrogen pollution, responsible for significant damage to the climate, ecosystems, and human health.[192] The nitrogen problem had been neglected by governing parties for many years until a ruling by the Dutch Council of State in May 2019 obliged the Dutch government to conform to its own environmental goals and EU biodiversity regulations.[193]

The series of farmer protests that ensued from 2019–2023 represent one of the highest-profile countermovements against European environmental policy. The protesters engaged in tactics such as lighting manure piles on fire,[194] threatening green campaigners and politicians,[195] and blocking roads, supermarket distribution centers, bridges, and harbors.[196] Similar tactics were subsequently adopted by farmers in Belgium, France, Germany, and Poland. This fight against nitrogen regulations, rooted in allegations that agriculture is unfairly and wrongly framed as a driver of climate change,[197] has been described as an attempt to generate enough political backlash to discourage any future political efforts to reduce herd size.

While not all Dutch farmers believe in the need for continued growth and enhanced production of animal agriculture,[198] those who do received much support from animal feed and livestock processing companies. For example, a Dutch newspaper revealed the role of the Netherlands-based feed company ForFarmers, which provided Agractie, one of the leading protest organizations, with financial, logistical, and communications support.[199] The investigative journalism platform Follow the Money reported that a coalition of feed producers and meat and dairy processors contributed to the protests by financing a lobbying platform called "Agri Facts," disguised as an independent fact-checker.[200] Furthermore, key players in the negotiations between protesters and government included the dairy arm of the Dutch agriculture organization LTO Nederland and a newly formed Agriculture Collective chaired by a former board member of two animal feed companies.[201]

In public, the farmers' movement in the Netherlands presented itself as the voice of traditional farmers whose livelihoods are threatened, an image that has garnered public support across the country. Meanwhile, the political negotiations sparked by these protests seemed to focus largely on maintaining industrial animal farming and limiting nitrogen policy to voluntary measures.[202] Initial negotiations between protesters

Continued

Box 4.3: CONTINUED

and the government resulted in concessions toward industrial meat and dairy production, with the agricultural minister promising that there would be no reduction of herds.[203] Grievances that affect smaller farmers, such as the adaptation of monitoring and reporting measures or the possibility for farmers to choose the most appropriate mix of environmentally friendly practices themselves, were not addressed.[204]

Agribusiness interests often hire public relations and lobbying firms to support their efforts to influence policy and public perception. For example, the Irish public relations firm Red Flag reportedly worked for Meat and Dairy Facts to promote positive messaging around animal products.[205] Although the role of think tanks and front groups in climate obstruction is studied mostly in the context of fossil fuels, emerging research on European think tanks indicates that such groups have also contributed to the creation of ignorance about the connection between livestock and climate change.[206] New climate-focused animal agriculture think tanks and nonprofit groups continue to be formed and promoted by the industry. For example, the US-based Center for Environment and Welfare was launched in 2023 to "educate the public and corporate leaders about animal extremists" and "to properly frame sustainability and environment issues."[207] The center is led by a partner at Berman and Company, a public relations firm with a history of working on behalf of the carbon majors.[208]

As discussed earlier, several high-profile academics and academic centers have served as contrarian voices in public and policymaking spaces, downplaying the livestock sector's climate impacts or undermining proposed policy responses.

While major environmental NGOs invite significant reputational risk if they partner with fossil fuel firms, agribusinesses continue to provide funding for environmental groups and boost their public images by partnering with them. In exchange for vague corporate commitments, such NGOs have played a role in facilitating agribusiness corporations' environmental claims (e.g., WWF's promotion of responsible and sustainable food labeling schemes with low standards[209]). The public-interest credentials of leading NGOs can lend legitimacy to questionable climate commitments and the companies making them, thus contributing to the narrative that the issue is being addressed. For example, environmental disclosure group CDP gave JBS an A- rating on climate, and the Nature Conservancy and Environmental Defense Fund worked with Tyson Foods to legitimize the company's climate-friendly beef claims.[210]

EFFORTS TO COUNTER OBSTRUCTION

The main form of response to animal agribusiness' climate obstruction is exposure: academic research, civil-society research projects, and investigative journalism have together increased public understanding of the nature and scope of animal agriculture-related obstruction efforts. Some of the obstructive narratives and practices documented in this chapter mirror those used by other industries, including oil and gas.[211] In 2020, the news platform *DeSmog*, whose reporting has focused largely on the carbon majors, launched an Agribusiness Database of companies and organizations that use climate change in their messaging, lobby around climate action, and may have ties to climate science denial.[212]

Climate change litigation focused on animal agriculture may emerge as a significant driver of climate mitigation and adaptation efforts in the years ahead.[213] There have been several attempts so far to formally sanction the industry. For example, in 2021, three Danish NGOs filed a suit against Danish Crown, one of the world's largest meat producers, over claims that its pork production is climate friendly, which the NGOs contend violate Denmark's Marketing Act. In response to the lawsuit, Danish Crown announced it would end the use of the "climate-controlled pig" label on pork packaging.[214]

Misleading climate-related claims are at the heart of other formal complaints as well. For example, in 2021, the US-based nonprofit Physicians Committee for Responsible Medicine petitioned the Federal Trade Commission, which regulates US advertising, to prohibit the NCBA from releasing advertisements portraying beef as an environmentally sustainable product.[215] In early 2023, the US-based nonprofit Mighty Earth filed a complaint with the National Advertising Division of the Better Business Bureau over JBS's issuing of sustainability-linked bonds that were tied to its stated goal to achieve net zero by 2040, and in early 2024 the New York Attorney General sued JBS's US subsidiaries for misleading climate-related claims (Box 4.4). In 2022, the Dutch city of Haarlem became the world's first municipality to adopt a ban on meat advertising as part of an effort to reduce GHG emissions.[216] In 2023, the UK-based environmental law charity ClientEarth submitted a complaint under the responsible business conduct guidelines of the Organization for Economic Cooperation and Development (OECD) against US-based Cargill for failing to adequately address its role in soy-driven deforestation and human rights violations in Brazil.[217]

More broadly, transnational agrarian movements that promote food sovereignty—"the right of peoples to healthy and culturally appropriate food produced through sustainable methods and their right to define their own food and agriculture systems"[218]—have emerged as a crucial force in

countering the productivity-focused status quo and growing corporate control of global food systems.[219] The concept of food sovereignty was introduced in 1996 by La Via Campesina, a global peasant movement that today continues to represent groups such as small and medium-scale producers, Indigenous people, and agricultural workers, advocating for sustainable, agroecological approaches to farming underpinned by social-justice principles.

Box 4.4: ATTEMPTS TO HOLD JBS ACCOUNTABLE FOR ITS NET-ZERO CLIMATE COMMITMENTS

The world's largest meat company, JBS, issued $3.2 billion in sustainability-linked bonds (SLBs) on US capital markets in 2021. These bonds were tied to the company's stated promise to cut emissions and achieve "net zero greenhouse gas emissions across our entire value chain by 2040."[220] With more than 500 facilities and products sold in 190 countries, JBS is a leading emitter of GHGs. In 2020, the company's emissions exceeded those of Spain.[221]

In January 2023, the NGO Mighty Earth filed a whistleblower complaint at the US Securities and Exchange Commission (SEC), alleging that the company's "net zero by 2040"-based SLBs were misleading and constituted US securities fraud.[222] The complaint alleged that the company's representations concerning GHG emissions reductions were false and misleading and that JBS failed to disclose to investors material information needed to evaluate the truth of its emissions-related claims, including data on the number of animals it slaughters annually and the company's Scope 3 supply-chain emissions, which are estimated to account for an estimated 97% of its emissions overall.[223]

In a 2016 SEC filing, JBS had disclosed detailed animal-slaughter figures by region but omitted these figures in its SEC filings since then, reporting figures only for its processing facilities' slaughter capacities.[224] This omission has allowed JBS to avoid independent verification of its emissions claims and to reject emissions estimates that independent analysts extrapolated from the company's slaughter capacity figures. The *Washington Post* compared this strategy to "an oil company neglecting to include emissions from burning the oil that it sells."[225]

An assessment of JBS's climate plans by the *Corporate Climate Responsibility Monitor 2022* also found no evidence of sufficient GHG emission-reduction plans.[226] In 2023, the US National Advertising Review Board recommended that JBS discontinue using five challenged net-zero claims—including "JBS is committing to be net zero by 2040"—in its advertising because the claims communicate misleading

messages and the company does not have a "formulated and vetted plan at present" for achieving its goal.[227] In February 2024, the New York Attorney General sued JBS's US subsidiaries for misleading customers over its climate goals and impacts.[228] The lawsuit stated that JBS "has had no viable plan to meet its commitment to be Net Zero by 2040."[229]

RESEARCH NEEDS AND INFORMATION GAPS

Compared with research on the fossil fuel sector, scholarship examining the nature and significance of climate obstruction related to animal agriculture is still nascent and sparse. To date, investigative journalists at outlets such as *InsideClimate News*, the *New York Times*, *DeSmog*, and *Unearthed* have played an instrumental role in uncovering and analyzing climate deception related to animal agriculture, as have NGOs such as IATP.

As discussed earlier, a significant amount of research on climate change and animal agriculture is conducted at universities that receive agribusiness funding. There is much need for independent environmental science and social science research about the linkages between animal agriculture and the climate crisis produced by research institutions unburdened by financial conflicts of interests and long-standing industry ties. Research needs and opportunities include:

- Investigations of corporate interactions with—and capture of—relevant government agencies and international standard-setting bodies, including efforts to shape the use of metrics. More broadly, research on the role of governments and state-owned enterprises in climate obstruction, including within the UN system and through trade negotiations.
- Investigations of the actions, internal knowledge, and choices of companies, trade associations, and their financial backers related to impeding climate action and supporting the continuation and expansion of emissions-intensive agriculture systems.
- Peer-reviewed quantification, tracking, and attribution of emissions related to industrial agriculture, including for feed companies. Emerging satellite and artificial-intelligence technologies hold the potential to help overcome the lack of comprehensive public GHG databases of dairy and livestock operations and to improve accountability.[230]
- Examinations of the overlap between the animal agriculture climate change countermovement and obstruction in other sectors such as oil and gas, tobacco, and ultra-processed foods, in terms of both strategies and supporting organizations, such as public relations firms and think tanks.

CONCLUSION

Reducing emissions from animal agriculture can contribute significantly to limiting climate change and maintaining a livable planet, whereas failing to act will render reaching current climate goals unfeasible. Effectively and justly reducing the climate impacts of animal agriculture will require dramatic changes in how we produce, consume, regulate, and subsidize livestock products, particularly in high-consuming countries. Although reducing production and consumption of animal-based products in these countries is considered necessary, the limited commitments and policy actions to date have focused predominantly on financial incentives for technical interventions with limited proven mitigation potential. Efforts aimed at effectively reigning in livestock-related emissions have been slowed or obstructed repeatedly by actors with vested financial interests in maintaining or expanding industrial animal agriculture. A better understanding of such obstruction, backed with rigorous, peer-reviewed evidence, will be a crucial step toward better safeguarding of climate and food policy from undue influence.

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