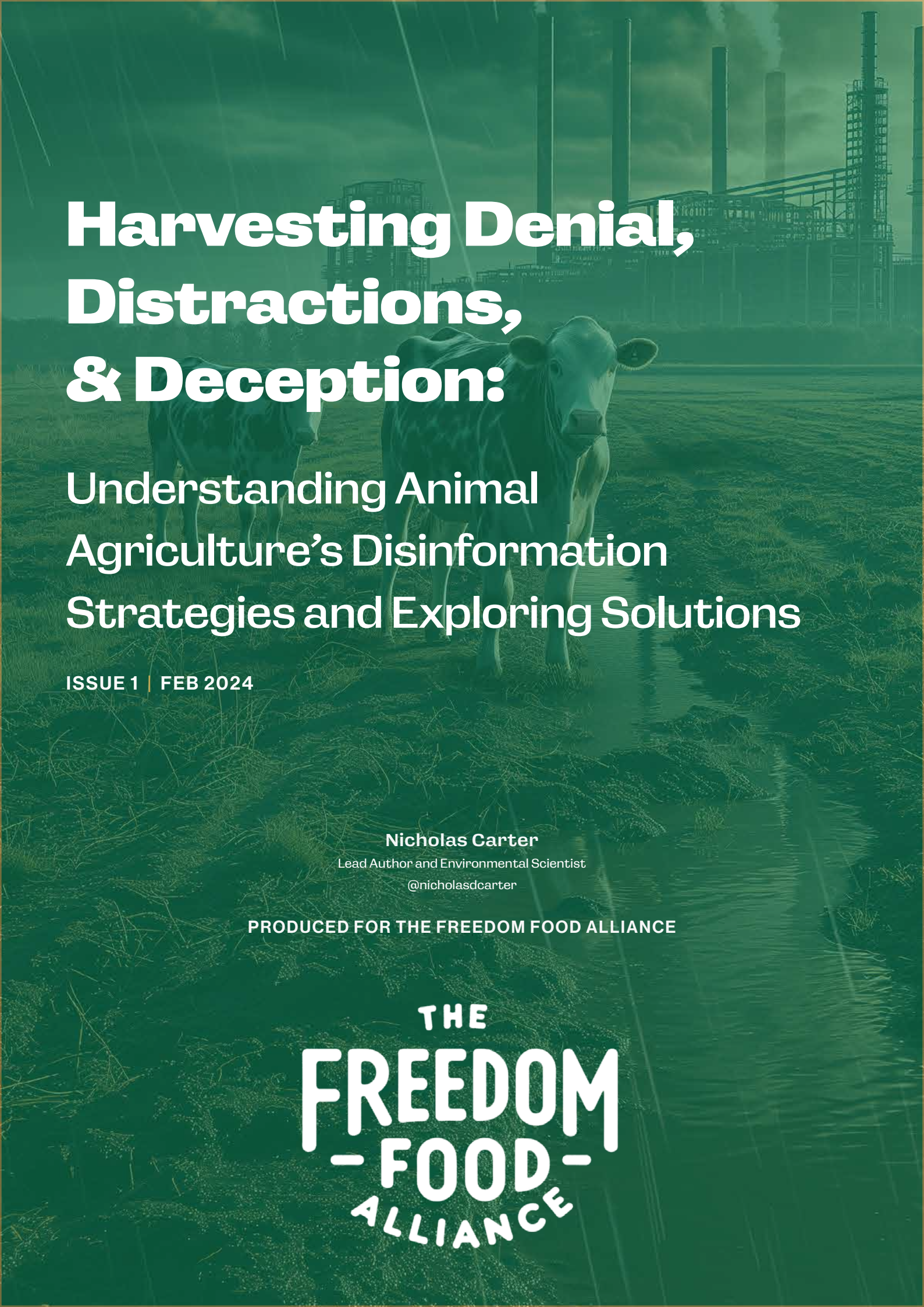

Harvesting Denial, Distractions, & Deception:

Understanding Animal Agriculture's Disinformation Strategies and Exploring Solutions

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PRODUCED FOR THE FREEDOM FOOD ALLIANCE

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This report was researched and written by Nicholas Carter for The Freedom Food Alliance.

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The author declares no financial or other conflicts of interest. Diligent efforts have been made to mitigate confirmation bias. The author observed the greatest possible care in collecting information and drafting this publication and made good faith efforts to be as rigorous and as fair as possible, but can assume no responsibility for errors in the sources quoted nor for changes in cited sources after the date of publication. We acknowledge that data limitations may lead to under- or overestimates. As we aspire to present robust and reliable results, we extend an invitation to all readers to share their observations, suggestions, and exercise critical judgment and verify the information presented herein.

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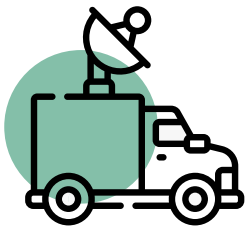
Contents

Executive Summary

Disinformation Strategies

Disinformation tactics employed by the animal agriculture industry, including companies, lobbies, trade groups, and influencers, hinder positive transformational changes. There is a multi-million dollar effort by industry and their allies to slow down the shift from animal-sourced foods to plant-based ones, despite a growing scientific consensus highlighting the environmental and public health imperatives.[1,2] While some strategies follow those used in other major industries like oil & gas, plastics, tobacco, etc, there are also some unique food-specific tactics. This analysis focuses on key strategies, including tactics to deny,[3] derail,[4] delay,[5] deflect and distract[6] meaningful discussion of the key issues, as well as methods that generally are intended to confuse and create doubt in the minds of policymakers and the general public.[7] It is common for the animal agriculture industry to challenge the necessity to shift to a plant-based food system,[8] question causation, dispute the messenger, and contest suggested pro-plant-based policies. Lastly, in this section of the report, the industry's tendency to portray itself as a victim is explored before going into examples that outline these overall strategies. Despite a long history of industry using these tactics, scientists and the general public are still ill-equipped, and ill-prepared, to deal with misinformation.



Misinformation and Disinformation Examples

Several significant cases of misinformation and disinformation originating from the animal agriculture sector are highlighted. These include the coordinated disruption of an Eat Lancet Commission Report with the #YesToMeat campaign,[9] the deployment of online astroturfing,[10] challenges to the plant-based industry linked to the Beef Checkoff Program,[11] the manipulation in the classification and the fear mongering campaign about plant-based foods as ultra-processed foods,[12] the exploitation of the topic of food security in industry-funded reports to rationalize meat consumption in affluent nations,[13] and the frequent methods used by the animal agriculture industry to downplay its environmental impacts. The report delves into efforts to hide such impacts through greenwashing, offsets, and via financial backing of academics, media, and experts who act as spokespeople for the industry.

Solutions

The report concludes with an exploration of potential and current solutions that underscores a multi-faceted approach to address the disinformation challenges at hand. Utilizing AI and satellite tracking for monitoring environmental impacts emerges as a promising avenue. Risk analysis, rooted in the well-studied economic concept of externalities, is identified as a catalyst for fostering change. The imperative of holding companies responsible and regulating corporate climate and animal agriculture transition plans is emphasized, along with the impactful role of non-governmental campaigns led by environmental organizations. To enhance the ability to keep major industry spokespeople and companies accountable, a comprehensive meat representative database would help, with some efforts already underway. And lastly, advocating for education on critical analysis and understanding of the hierarchy of evidence is highlighted as an essential step to avoid the successful deployment of disinformation.

Key Findings

- A #YestoMeat industry-funded coordinated digital campaign derailed the Food in the Anthropocene EAT–Lancet Commission report. This effort hurt the public perception of a report that consisted of consensus findings from 37 world-leading scientists from 16 countries from various scientific disciplines defining targets for healthy diets and sustainable food production.

- An industrial fisheries lobby prohibited an attempt to eliminate subsidies for illegal, unreported, and unregulated (IUU) fishing and limiting fishing of overfished stocks.

- A proposed high-seas protection offered a potentially significant stride in ocean conservation, but scientists who fail to disclose industry funding influence and support bottom trawling are actively spreading misinformation to the public and in academic literature.

- Some research and university centers were found to have received millions in funding from industry players who would stand to benefit from shifting public perception on what is driving planetary issues.

- We reveal the latest in social media bots and astroturfing campaigns benefiting animal agriculture, with suspected links to lobbying groups which have previously represented the tobacco industry, and now represent the biggest meat companies in the world.

- Beef Checkoff Program ads run in world leading media platforms downplaying climate and environmental impacts including avoiding life cycle analyses and opportunities to drawdown carbon on freed up pastureland.

- Over 90% of most major meat and dairy companies emissions - representing scope 3 third party supply chain emissions - are mostly omitted from their climate goals, including those of JBS who continues to make net zero by 2040 statements despite the National Advertising Review Board advising to discontinue this misleading claim.

- Downplaying food waste is shown when a 2:1 loss of food crops is viewed as highly efficient and a cause for celebration via live vs. edible food conversion rate methods.

- Greenwashed versions of animal agriculture (e.g. regenerative ranching) are being funded by the biggest oil and gas companies in an attempt to offset their impacts, when the ranching industry can't even offset their own.

- The regenerative agriculture movement has set up the foundation for delaying changes away from animal-sourced foods, and is also greenwashing other highly polluting industries by positioning themselves as carbon offset avenues.

- By reinforcing industry narratives, oversimplifying complex issues, and frequently promoting false or misleading information, the media and social media influencers often contribute to a skewed public perception of animal agriculture's impacts.

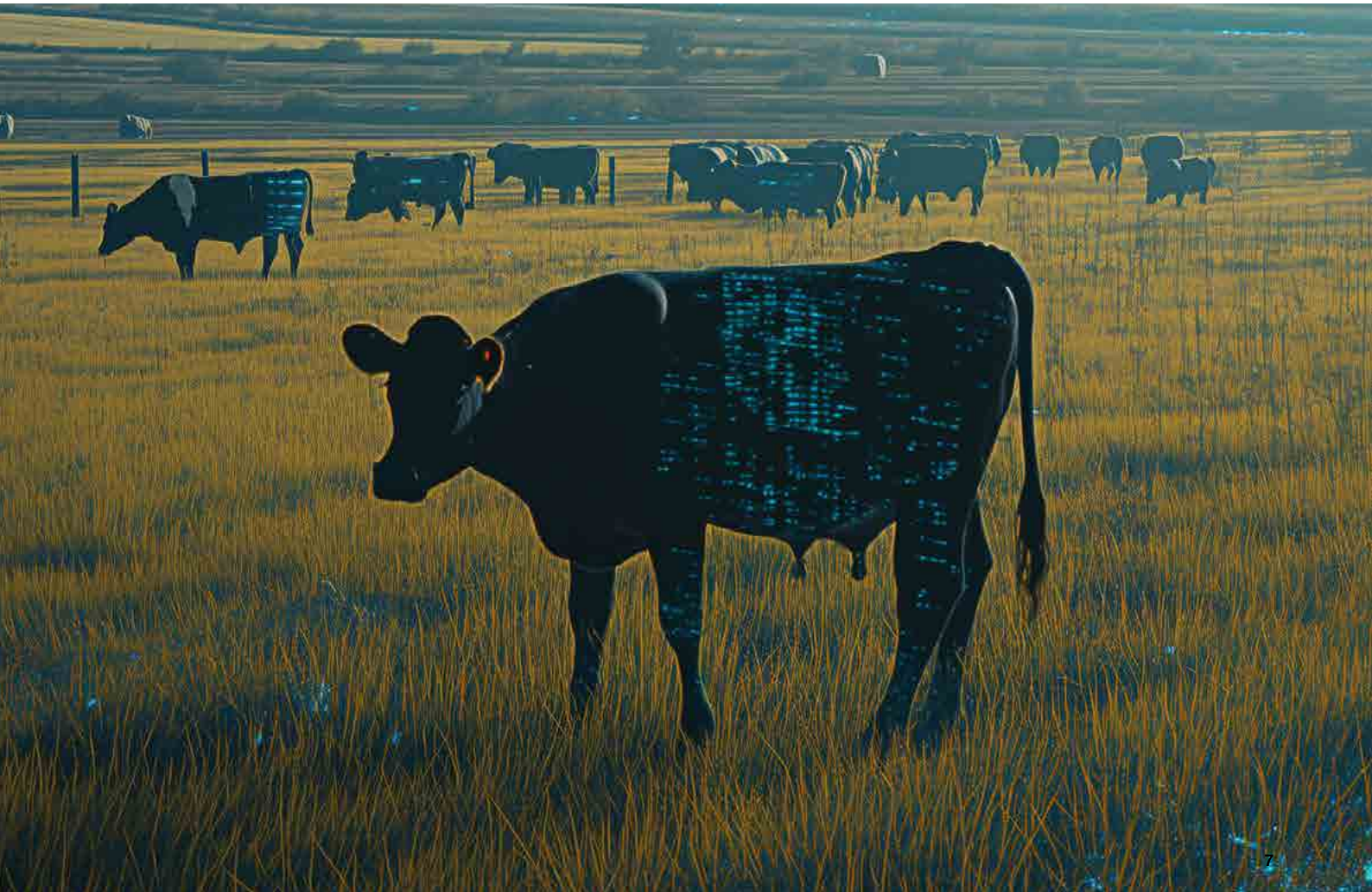
- Tactics of doubt and confusion are widespread, whereby foods are categorized arbitrarily as whole or ultra-processed, using that as the dominant lens through which to perceive foods health impacts, thereby minimizing the greater importance of research on individual foods on a case by case basis.

- A coordinated 'Clean Food Facts' disinformation campaign by the Center for Consumer Freedom aimed to shift public perception to label plant-based and animal-free alternatives as unanimously unhealthy, fake, ultra-processed, and full of planet-damaging and unhealthy seed oils.

- An FAO report that was overseen, edited and influenced by the Global Dairy Platform, International Dairy Federation, International Meat Secretariat, International Natural Sausage Casing Association, and International Poultry Council falsely claimed Dr. Walter Willet as an advisor who since demanded to be removed from the endorsement.

- An Irish government agricultural agency (Teagasc) supported a declaration and campaign that conflicts with scientific consensus and included communications agency Red Flag - with the North American Meat Institute (NAMI) among its clients - as responsible for crafting press releases and formulating promotional tactics for the declaration.

- Lastly, many solutions are proposed including: AI and satellite tracking for land and ocean environmental accountability; risk analyses on climate impacts requiring food system changes; legal accountability for those who fund and coordinate campaigns that downplay impacts; regulation of greenwashing and carbon neutral claims, managed transition support; animal agriculture database of disinformers; academic integrity improvements; and clear educational campaigns to inoculate disinformation.



Introduction

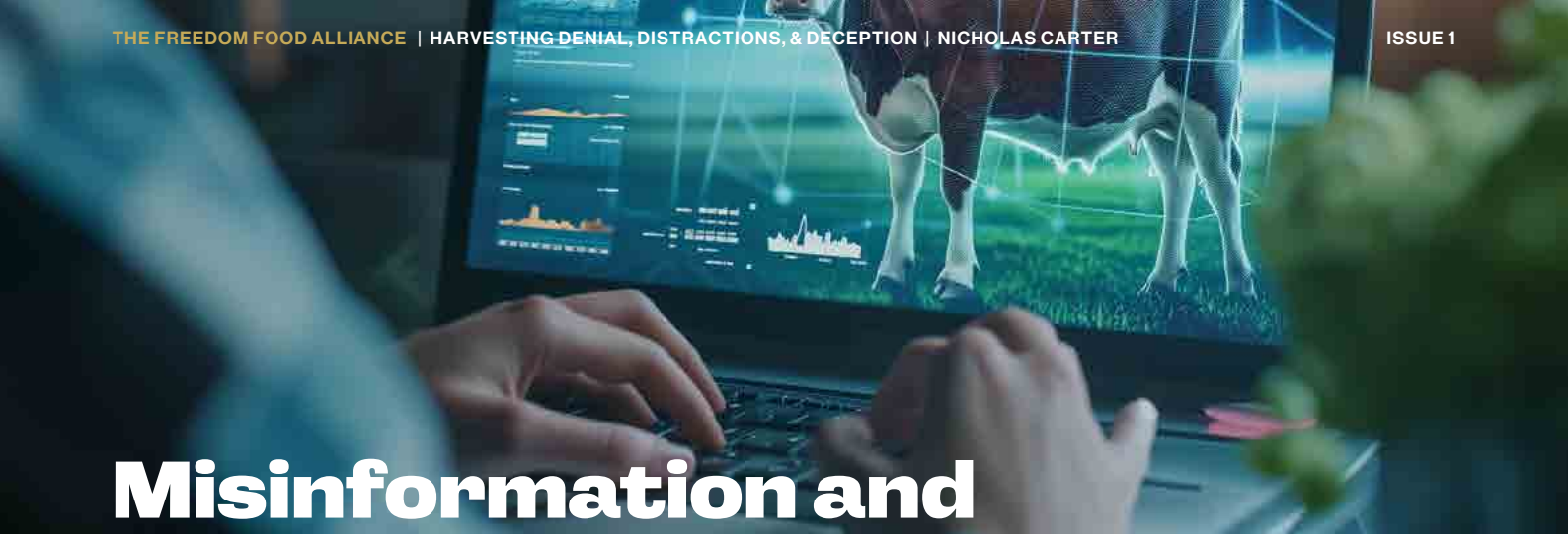
As the world grapples with the current and looming challenges of climate change and the ecological crisis, food systems have been recognized as both a significant contributor to the problem and a potential pathway to a solution.[14,15]

A recent study reviewed the major agricultural policies that shape or hinder a transition away from animal products between 2014-2020 in the United States (US) & European Union (EU). The researchers concluded that "powerful vested interests exerted their political influence to maintain the system unchanged and to obstruct competition created by technological innovations".[16]

> *"The power of the animal farming sector, both in the US and in Europe, and the political influence they have is just gigantic."*
> Prof Eric Lambin

Instrumental power manifests itself through governments' implicit acceptance of negative externalities (e.g., greenhouse gas ("GHG") emission, pollution) and the industry's ability to influence policies that delay major changes.[17] In this AI-powered age of information, the ominous impact of disinformation is as unparalleled of a danger as any, rivaling historical threats, and fueled by potent industry incentives. The ultimate driver of policy for both governments and companies is public opinion: the politicians and companies that succeed will be the ones which are selling what the public wants. Here, we demonstrate how representatives of the livestock industry have sought to systematically spread misinformation and disinformation to align public opinion with their financial incentives.

Misinformation and Disinformation Strategies



Misinformation and Disinformation Strategies

A transition from animal agriculture to a plant-based and animal-free precision fermentation food system is an emerging theme within this broader conversation, yet the pace of this transition has been remarkably slow. One of the reasons behind this inertia is industry-originated disinformation tactics designed to deny, derail, delay, deflect, and distract from the urgency and importance of such a shift.[18]

Misinformation and disinformation, while similar in their outcomes, differ significantly in intent. Misinformation refers to false or inaccurate information that is spread, often unwittingly, without the direct intent to deceive.[19] It can arise from honest mistakes, misinterpretations, or misunderstandings. In contrast, disinformation refers to false information that is deliberately created and spread with the explicit purpose to deceive or mislead. It is inherently tied to intentions of manipulation or deceit. Uncertainty in verifying information and identifying human intention, coupled with the power of brokers, creates an environment for mis-dis-mal-information ("misinformation", "disinformation", "malinformation").[20] Malinformation is typically spread with the intent to cause harm, whether by misleading the public, advancing a particular agenda, or undermining efforts to address critical issues like environmental impacts associated with animal agriculture.

This report will primarily use the terms misinformation and disinformation relative to the weight of evidence for financial or other forms of intention or motives to deceive. The key concern lies in the persistent promotion of misleading information, obstructing beneficial changes in policy, regulation, and social norms. This becomes particularly critical, given the existing scientific consensus on necessary changes for our health, environment, and society.[21]

Disinformation has grown over the last decade, with increased attention driven by significant events in the last five to seven years including notably the global pandemic.[22] These events shaped both social attention and conceptual developments.

LEARN MORE:

- Project Muse: What is disinformation?

Deny

This tactic involves outright rejection or dispute of the established facts or consensus, often by challenging the validity of the scientific data or questioning the credibility of the sources. This is usually the first strategy until it no longer works, as is clear with the fossil fuel industry shifting away from climate denial. With food, denial is alive and doing well as a strategy. Denying that methane from cows has any impacts and that it's perfectly cycled is currently a major denial tactic.

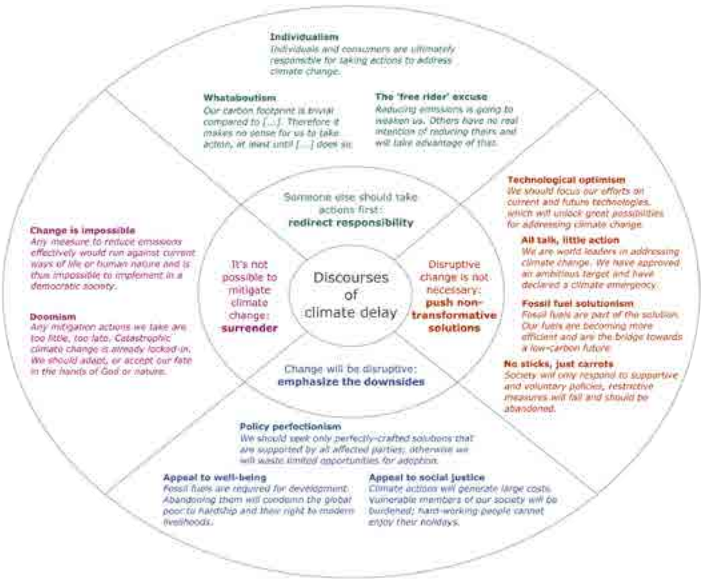
The biogenic methane cycle claim is a story of perfect recycling where grass absorbs CO_2 from the atmosphere, cows eat the grass and turn the carbon into methane (CH_4) in their stomachs, the methane is then emitted and breaks down into CO_2 in the atmosphere, only to be absorbed again by plants, with the cycle repeating itself.[23] This narrative conveniently ignores the warming effects of methane emissions by only focusing on the CO_2. Photosynthesis takes CO_2 from the atmosphere, cows emit CH_4. This is far from climate neutral, as CH_4 has a much larger warming effect (up to 80 times more over 20 years). The origin of the carbon atoms in methane, sourced from the atmosphere initially, is virtually irrelevant to the total warming impacts. Massive increases in the number of farmed animals have led to a 332% increase in methane emissions from the industry from 1890 to 2014.[24,25,26,27] The denial tactic to pretend like it's a perfect cycle plays on the complicated nature of methane vs. carbon dioxide, and tells a convenient story to maintain business interests.

Derail and Delay

To derail is to shift the conversation or actions off course, usually by introducing new or unrelated topics or concerns that divert attention from the primary focus. This could involve focusing on the limitations or potential adverse consequences of proposed changes, failing to acknowledge that all theories of change have limitations, but the status quo and business-as-usual are shown to bring major issues.

The delay tactic involves advocating for postponement of decisions or actions, often citing the need for more research, evidence, or deliberation. Of course both derail and delay may first involve denial, but format it in a new way. Delay strategies create an illusion of ongoing uncertainty and can effectively stall policy changes or public opinion shifts. Strategies to derail and delay progress typically focus on undermining the validity and urgency of the scientific evidence that supports a transition to plant-based food systems. Claims of concern of local food security so food system changes should not take place, and failing to acknowledge animal-sourced foods' role in food insecurity, is a common delay tactic.[28] A more subtle approach might involve calling for additional studies or reviews to create an illusion of uncertainty and buy time, even when the scientific consensus on a topic is already robust.[29]

Discourses of Climate Delay[30]



Deflect and Distract

Deflection involves shifting blame or responsibility away from the issue at hand towards other sectors, actors, or factors. The goal is to decrease attention or urgency related to the primary concern by emphasizing other allegedly *more significant* or *more urgent* problems. Many animal agriculture advocates are quick to exclaim that any calls to improve our food system are a distraction from addressing fossil fuels. Many advocates for animal agriculture distract by focusing on the potential job losses that a transition away from animal agriculture might entail, even though it could largely increase jobs and help the economy, thus diverting attention from the central issue of environmental sustainability. Another common distraction is feedswaps like seaweed fed to cattle, that have some minor utility but are mainly a distraction.[30]

Denial, derailment, delay, deflection, and distraction tactics are commonly used across various industries like tobacco, fossil fuels, chemicals, food and beverages, and plastics to undermine scientific consensus, change public perceptions, protect industry interests, and delay regulatory action. These strategies are aimed at sowing doubt, preserving the status quo, and diverting attention from the negative health, environmental, or social impacts of their products or practices.

Understanding these tactics is essential as we strive to facilitate a transition to a more sustainable food system.

By recognizing and countering these strategies effectively, we can maintain focus on the substantial scientific evidence that underscores the urgency and importance of transitioning away from animal agriculture to a plant-based system.

Corporate Science Strategy & Solutions

If none of the above work, the next corporate science denial '4 prong' strategy, outlined by Dr. Jennifer Jacquet, fills in the gaps in industry strategies deployed:

- Challenge the problem
- Challenge causation
- Challenge the messenger
- Challenge the policy[31]

It's like a casino where the odds favour the house (the corporation) but the games are designed to distract people and keep them inside as long as possible. They're all hidden yet obvious when identified.

Social media platforms play a significant role in this dynamic.[32] They can serve as a rapid, broad-reaching tool for spreading information, but they also facilitate the dispersion of disinformation and misinformation. These platforms often act as battlegrounds where ideas compete for attention and credibility, often resulting in skewed representations of scientific consensus or outright disinformation dominating the discourse.[33]

A recent study utilized a systematic review process where initially 2148 records from 2005 to 2021 were collected, resulting in 643 eligible articles and after theme-based screening, the focus narrowed to 89 articles, and the final review included 28 articles. The results showed:

> *"Disaster, health, and politics emerged as the three domains where misinformation can cause severe harm, often leading to casualties or even irreversible effects. The mitigation of these effects can also demand substantial financial or human resources burden considering the scale of effect and risk of spreading negative information to the public altogether."*[34]

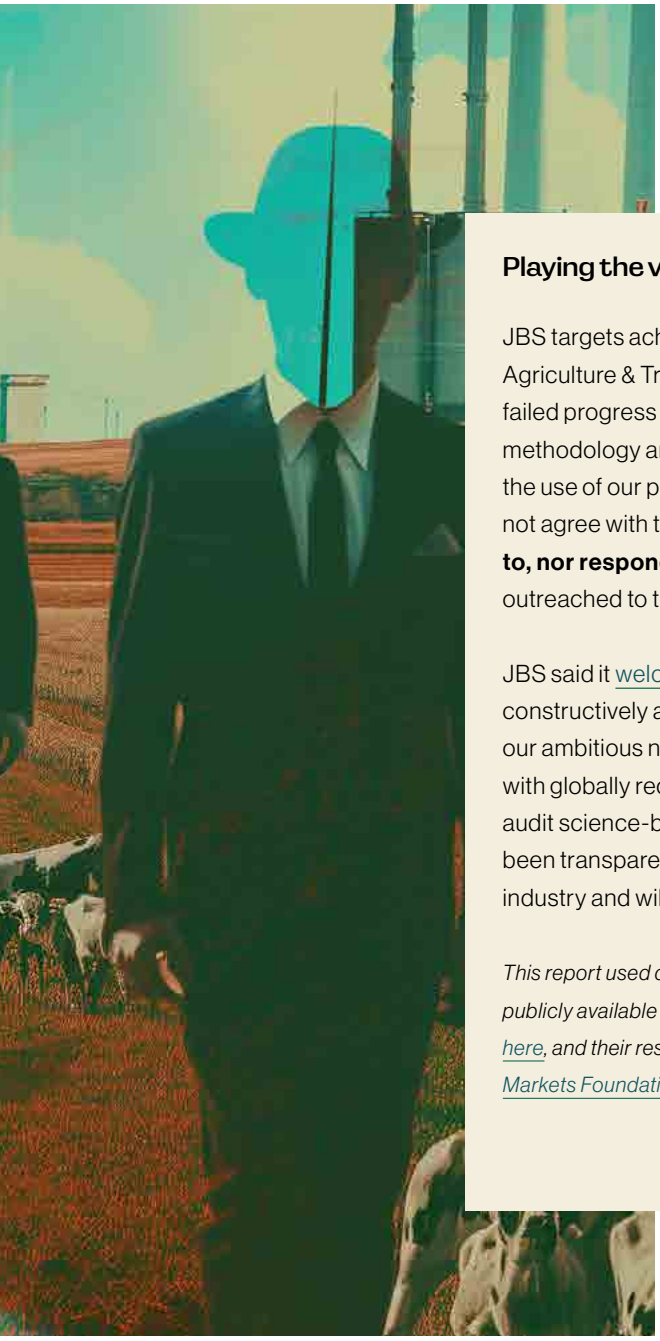
This underpins the collective crises of misinformation and food systems. Food impacts health, has the potential to create environmental disasters, and politics are wrapped up in it all.

Playing the Victim

Major animal agriculture companies and lobbies often resort to portraying themselves as victims and making performative adjustments when their environmental practices are questioned or criticized.[35] This defensive strategy aims to divert attention from the challenges they face in achieving even basic environmental goals and sidestep accountability for their environmental impacts. By painting themselves as targets of unjust scrutiny, these companies attempt to shift blame onto external factors, such as flawed methodologies or exaggerated claims, as a means of undermining the credibility of reports or research that highlight their shortcomings.[36]

Companies may assert that they were not afforded the opportunity to contribute to or critique a report's findings before publication, portraying themselves as victims of an unfair narrative. This allows them to deflect attention away from the substance of the findings and instead focus on perceived procedural injustices, thus casting doubt on the validity of the report's claims.[37]

By embracing a "victim" narrative, major animal agriculture companies aim to create a sympathetic image that elicits understanding from the public and stakeholders. This approach not only attempts to shield them from criticism but also provides a platform to communicate their own initiatives and efforts, potentially reshaping the conversation to their advantage. This strategy often sidesteps the core issues of environmental impact and sustainability, detracting from the urgent need for meaningful change within the industry.



Playing the victim: JBS, the world's largest meat producer

JBS targets achieving net zero greenhouse gas emissions by 2040. The Institute for Agriculture & Trade Policy (IATP), Desmog, and Feedback highlight in a report the failed progress towards this goal. A JBS spokesperson said the report used "flawed methodology and grossly extrapolated data to make misleading claims, including the use of our processing capacity to estimate our emissions", adding: "While we do not agree with their methods and **were not given the courtesy of contributing to, nor responding to, the report's findings prior to publication**, we have outreached to the NGO to review their findings in full in pursuit of our mutual goal."

JBS said it welcomed the report's "scrutiny and the opportunity to discuss how we constructively address and quantify the challenges facing our industry. Attainment of our ambitious net-zero target is our number one priority and we are concertedly working with globally recognised leaders in this area including SBTI to benchmark, agree and audit science-based emissions reduction targets across Scope 1, 2 and 3. We have been transparent about the timelines required to do this as we lead the transition of our industry and will be providing updates as we complete each stage of our journey."

This report used data and methodology that are described here. The estimates were based on the best publicly available information at the time of our research. JBS provided a response that can be found here, and their response has been taken into account in the data used in IATP's report with the Changing Markets Foundation. A joint statement by IATP, DeSmog and Feedback to JBS can be found here.

Skip to JBS Offset Scam

It's not just major animal agriculture companies spreading the narrative that the meat industry is the victim of "anti-meat militancy", academics working with the industry frequently publish on the strategies to counter animal agriculture's health, environment, and social impacts.[38] Frédéric Leroy is a professor at the University of Brussels, president of the Belgian Association for Meat Science and Technology, and frequent pro-meat publisher. Not only does he frequently cite and work with other highly paid reps for the animal agriculture industry like Peer Ederer,[39] but he also regularly implies that the plant-based narrative aligns itself with wealthy individuals and top-down charities. While there have been some high net worth individuals now urging food system change, this narrative fails to acknowledge that the amount of US & EU public money supporting plant-based alternatives is 0.1% of the subsidies awarded to animal agriculture.[40] 190 times more money goes into lobbying for meat in the US and several times more in the EU as compared to for plant-based. Markets are increasingly driven by lobbying, rather than genuine demand. In the EU, cattle businesses get 50% of their income from subsidies, many for increasing herd sizes.[41] Between 2015-2020, financial institutions gave over $478 billion[42] to meat & dairy corporations globally. Between 2010-2020, plant-based food, cultivated meat, and precision fermentation companies, all of which would significantly reduce land pressures, and most other environmental metrics, received just $5.9 billion in investments.[43]

Brandolini's Law

Brandolini's Law, or the "Bullshit Asymmetry Principle," aptly illustrates the challenge of combating disinformation in the context of animal agriculture and the imperative to shift towards a plant-based food system. Brandolini's Law underscores the significant effort required to counter such falsehoods. Advocates for plant-based foods must invest substantial resources in fact-checking, research, and persuasive communication to debunk these narratives.

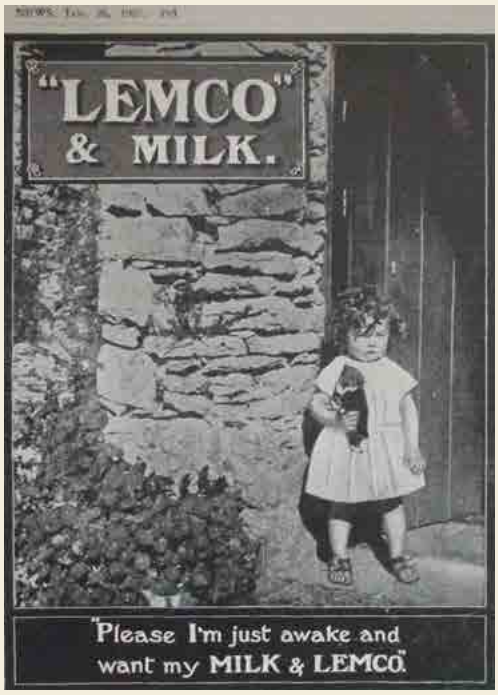
> *"The amount of energy needed to refute bullshit is an order of magnitude bigger than to produce it."*[44]

As long as the animal agriculture industry perpetuates disinformation, the shift towards sustainability and ethical dietary choices remains hindered. Addressing this issue necessitates greater industry transparency, strict regulation against false advertising, and comprehensive educational campaigns to empower consumers with accurate information.

Brandolini's Law serves as a reminder of the uphill battle against disinformation. To create an ecological, ethical, and truth-driven food system, we must acknowledge the power of false information and collectively strive for a future where accurate information prevails.

Where Does Food Misinformation Originate?

Despite scientific literature building throughout the mid-1900s about the ability to thrive on what was considered a vegetarian diet at that time, misinformation has proliferated.[45,46]



Sourced from Table Debates

The power of a good story

"The power and influence of 'scientific consensus' is nothing against the power of a good story."
TABLE Report: Primed for Power. A short cultural history of protein.[47]

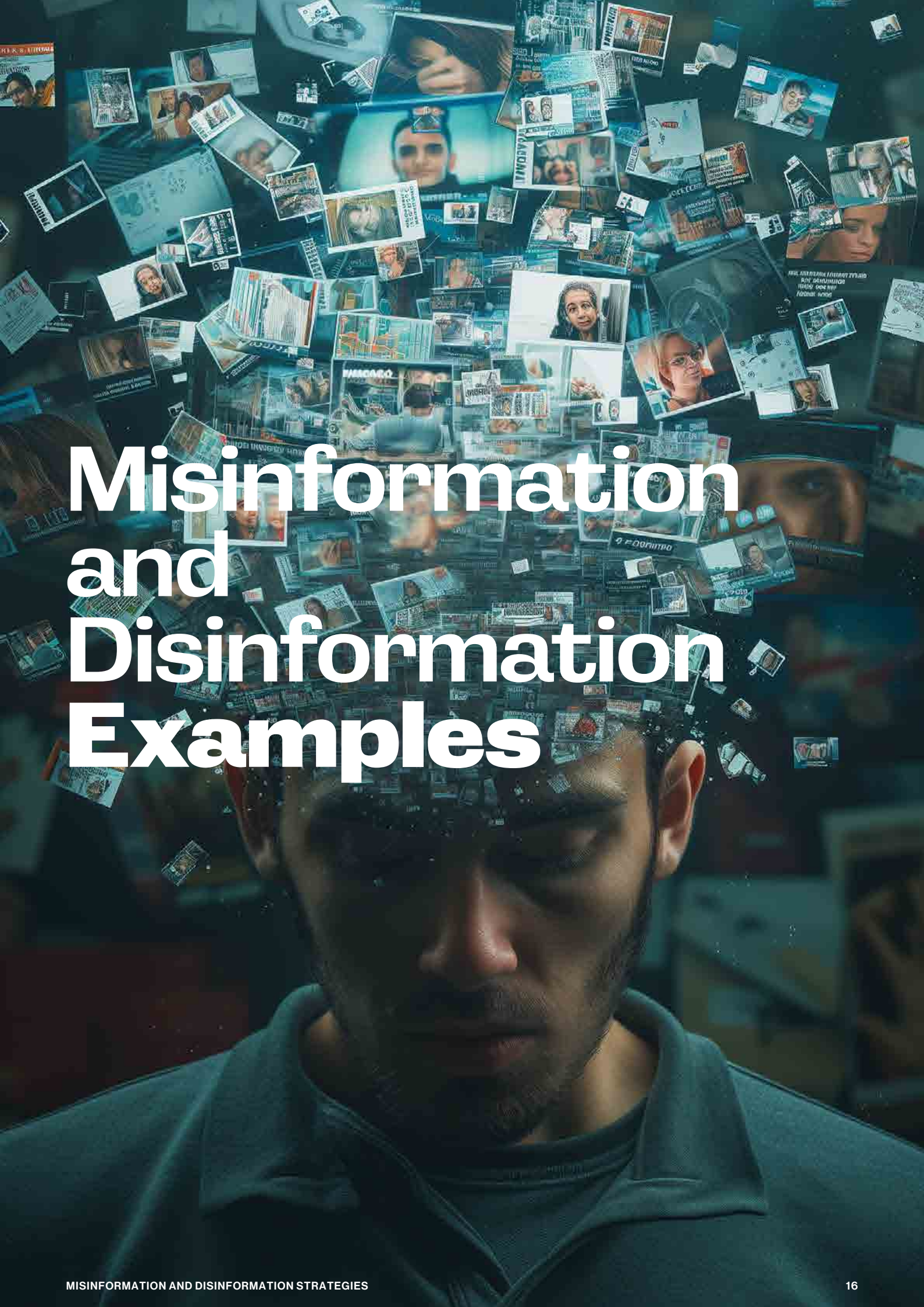
"Advertising played a major role in popularising positive links between milk, growth and strength. The idea that milk was a uniquely complete food had been utilised in adverts at least since the first milk-derived protein supplements at the turn of the century. Lobbying and marketing bodies representing the dairy industry were set up in various countries in many cases by the state. These included the US (the National Dairy Council, 1915), Sweden (the Milk Propaganda [Mjölkpropagandan], 1923, and later Swedish National Association of Dairies [Svenska Mejeriernas Riksförening]1932), and Britain (the National Milk Publicity Council, 1920, and later the Milk Marketing Board, 1933), as well as Germany (1927), Finland (1927), Norway (1928), Japan (1931), Denmark (1932), Belgium (1938) and the Netherlands (1930s),152."
TABLE Report: Primed for Power. A short cultural history of protein

Today, food and agriculture disinformation is propagated through particular groups and individuals, often difficult to identify the exact particular origin. Examples listed for animal agriculture specific claims:

- Businesses and Employees
- Industry Associations
- Lobbyists
- PR Firms
- Industry-Funded Researchers
- Media Outlets and Social Media Influencers
- Politicians and Parties Supported by Industry
- Governments
- Funded Health or Environment Advocates
- Non-Governmental Organizations

Understanding the dynamics of disinformation and misinformation is critical, especially in the digital era. By examining trends and patterns in how false information spreads, we can create more effective strategies to counter it, ultimately protecting the integrity of crucial health and climate information.

Skip to Solutions



Misinformation and Disinformation Examples

Misinformation and Disinformation Examples

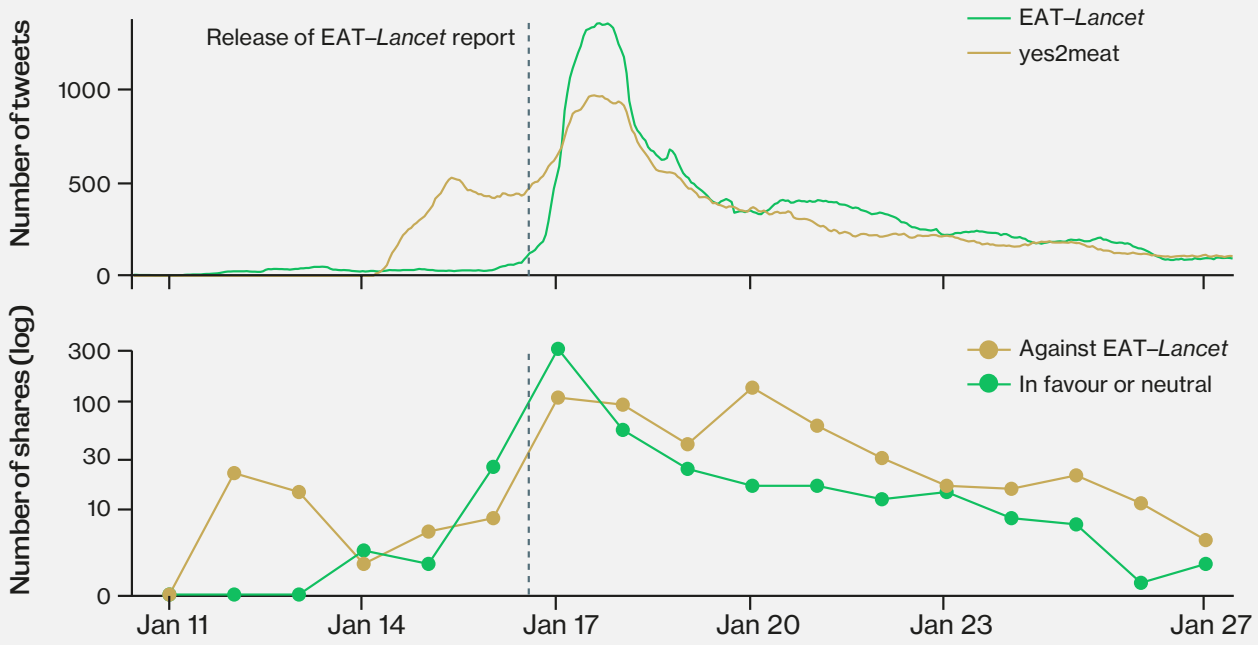
#YesToMeat Derailment of Planetary Health Diet

The EAT–Lancet Commission consists of 37 world-leading scientists from 16 countries from various scientific disciplines with a goal to reach a scientific consensus by defining targets for healthy diets and sustainable food production.[48] Their 2019 report included The Harvard School of Public Health and Stockholm University, 19 commissioners, 18 co-authors, 16 countries, and experts in human health, agriculture, political science, and environmental sustainability.[49] Although it was well-received by mainstream academic and some media, a coordinated digital backlash effort to discredit the report a week before it was launched diluted its potential positive impact.[50] This campaign was coordinated by the UC Davis CLEAR Center, a communications outlet founded and funded by iFEEDER, a livestock feed industry association.[51]

To understand the effect of this controversy, an analysis that collected and analyzed a dataset of Twitter activity linked to EAT–Lancet and the hashtag #yes2meat with 4,278 Twitter users and 8.5 million tweets was reviewed (appendix p 1).[52] A digital countermovement managed to organize itself rapidly, dominating online discussions and sparking conspiracy theories. This counter-movement began one-week before the report launch on Jan 17, 2019.

Skip to UC Davis CLEAR Center

Figure A



Number of tweets and links, and community structure related to EAT-Lancet and yes2meat. The graph shows a time series of the number of tweets for each term in a 24 h rolling window over the first weeks after the EAT-Lancet launch (Jan 11–27).[53]

Figure B: Follower Network

Based on a dataset of 15,520 tweets, 7,281 tweets mentioning EAT-Lancet in some form, 8,586 mentioning yes2meat, and 347 mentioning both. A follower network with nodes and their outgoing links is coloured by community and coloured word clouds of the profiles of users in each community (B). Words have a size proportional to their frequency in profile text. The largest community (blue) is generally positive, with the second largest (red) very negative, and the third one (yellow) displaying a mix of sentiments. The fourth community (green) is composed of vegan diet supporters that opposed yes2meat independently of the EAT-Lancet Commission.

Figure B shows the urgent need for more resources to be allocated to counter misinformation (shown in green). By actively promoting #Yes2Meat before, during, and after the EAT–Lancet report launch, this counter campaign succeeded in ensuring that responses to the report were approximately ten times more likely to be negative than positive or neutral, despite the fact that this report was one of the most academically respected and well-researched food reports as it relates to health and the environment of the past decade. The counter-campaign largely achieved what it set out to do, which was to create doubt, false narratives, distract, derail, and deflect to other issues.

Although one might make the case that social media and rapid digital communication systems appear to benefit independent media over conglomerates, the truth is that they are manipulated to favor those with the highest income, enabling them to plan and synchronize responses to any potential business challenges.[54]

Denying the Need for High Seas Protection

The fishing industry is responsible for some of the most serious environmental threats to the planet. The industry is responsible for significant disinformation and benefits from weak regulation, especially in non-national jurisdictions.[55] They also continue to influence subsidies where there should be broad consensus, including an agreement struck at the World Trade Organization to prohibit subsidy support for illegal, unreported, and unregulated (IUU) fishing and limiting fishing of overfished stocks.[56]

A particularly acute area is the two-thirds of the ocean known as the high seas (and seabed below) located beyond national boundaries. No state can solve the problems facing these areas alone.[57] Most recently, momentum finally led to the March 5, 2023 agreement to establish a framework for designing marine reserves in international waters, outside of specific national jurisdictions, dubbed the High Seas Treaty. The area covered by the treaty represents 64% of the sea outside national exclusive economic zones and is governed under the under-resourced 1982 United Nations Convention on the Law of the Sea (UNCLOS).

This protection marked a significant stride in ocean conservation.[58] The establishment of globally safeguarded zones serves as a crucial tool for protecting vital environments. While deliberating over high seas activity regulations, UN member nations needed to assess the overall effectiveness of Marine Protected Areas (MPAs) in preserving ecosystems, given their established success.[59]

While MPAs have some shortcomings, particularly in safeguarding migratory species like tunas, with supplementary strategies like meticulous ecological and economic planning, they can be highly successful. MPAs paired with strict regulations on catches, labor, markets, and laws that empower island nations to reinforce their economies and enforce regulations, and nurturing a profound cultural appreciation for marine animals, have a much higher likelihood of success.

The campaigns to misinform about MPAs and High Seas protection have not been as successful as the #YesToMeat campaign leading up to the Eat Lancet Commission. However, time will tell whether international marine reserves can be agreed upon and enforced, and to what degree they will be protected from industrial fishing.[60]

Blue Planet Society: Disinformation swells against high seas marine reserves | Spencer Roberts

Ray Hilborn: Fisheries Scientist or Fisheries Rep?

When it comes to denying the impacts of fishing, fisheries biologist Ray Hilborn is one of the most often cited voices. He fails to disclose millions in seafood industry funding for his research. He led an anti-MPA campaign sharing on twitter leading up to the High Seas Treaty.[61] Hilborn's Sustainable Fisheries of the University of Washington report disseminated a host of disinformation about MPAs. His findings were shared multiple times on social media, both before and during the High Seas Treaty discussions, hampering the progress made by the latter.

The study Hampton, et al. 2023 citing Hilborn often is inadequate not only in its capacity to evaluate the efficiency of MPAs but has also been distorted by the accompanying commentary.[62] If the aim is to protect tuna, the MPAs in these models were poorly planned – creating arbitrary rectangles, without consideration for oceanographic currents and migratory patterns of the tuna species whose populations it models.[63]

Marine Protected Areas do in fact work, and have also been shown to do so specifically for tuna.[64,65] In the few cases that an MPA does not work, it is usually the result of government kowtowing to industry, as with Britain's protected areas where industrial-scale bottom trawling has been allowed, and the government even blocked an amendment to its 2020 fisheries bill that would have banned it.

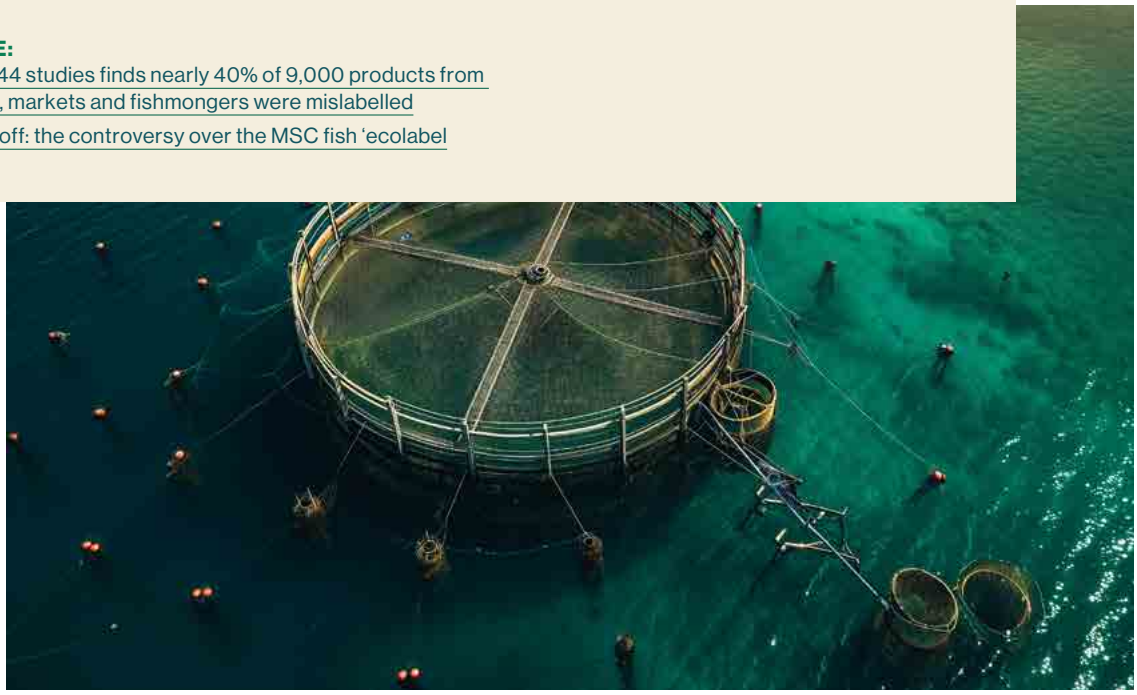
Documents obtained by Greenpeace through two Public Records Act requests reveal that Hilborn has received at least $3.56 million from 69 fishing and seafood industry groups. Hilborn has violated the policies of scientific journals by failing to disclose these conflicts of interest in multiple publications.

In addition to his continued criticism of Marine Protected Areas (MPAs) - he claims marine reserves are ineffective - he's also published claims that bottom trawling can be sustainable, ironically with the help from many parties that are certified by the Marine Stewardship Council (MSC).[66]

Luckily, we now have the technology to monitor and enforce no-fish marine protected areas to a greater extent, and while MPAs do still require improvements,[67] it's an important solution for wild marine animals and the health of our oceans that we all depend on.

LEARN MORE:

- Analysis of 44 studies finds nearly 40% of 9,000 products from restaurants, markets and fishmongers were mislabelled
- Blue ticked off: the controversy over the MSC fish 'ecolabel



Funding of Experts

The academic publishing landscape is diverse, and ethical practices vary widely. While there have been concerns about conflicts of interest and potential biases in industry-funded research, not all researchers or investigators engaged in industry-funded studies engage in unethical behavior.[68] Transparency, peer review, and accountability mechanisms can play a vital role in maintaining the integrity of academic publishing. Ethical guidelines and standards are designed to prevent misconduct and ensure that research findings are accurately reported, regardless of funding sources. It's essential to evaluate individual cases and consider the broader context of academic publishing rather than assuming a blanket statement about industry-funded research.

The first priority for any researcher should revolve around exploring claims or possibilities and uncovering accurate responses to scientific queries.[69] Yet this objective is increasingly overshadowed by secondary interests, whether financial or non-financial in nature. The objectivity of research might become jeopardized when the researcher has vested interests tied to study outcomes.

Meanwhile, the global marketing budget for animal agriculture reaches into the hundreds of millions of dollars each year. It encompasses many channels, including traditional and social media outlets, sponsorship of researchers, writers, film and TV productions,though academics and experts form the first point of contact before misinformation campaigns seep into the media.

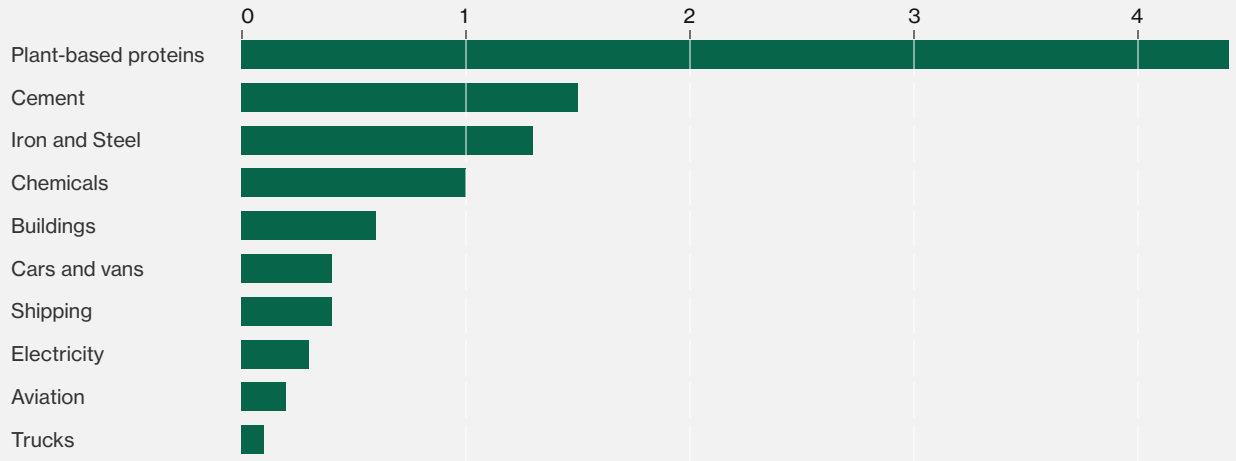
Industry groups like the North American Meat Institute fund research and academics to cover specific meat production and consumption impacts and solution narratives. As of 2021, their general members included Cargill, JBS USA, Maple Leaf Foods, Smithfield Foods, Tyson Foods, Walmart, and OSI Group (a US-based holding company of meat processors supplying brands such as McDonald's, Chipotle, and Burger King).[70,71,72,73]

Corporate interests can fund scientific studies with defined questions and design while holding back funds unless results are favorable.[74] The literature is steeped in pseudo-science, both forming the basis for persuasive storytelling and embedding disinformation within its promotional tactics. Then, with experts from the animal agriculture industry showing a trend, they can infiltrate and influence government policies, health and environmental bodies, and even United Nations schemes at a political level.

Meanwhile, a coordinated collaboration of industry animal scientists are pretending that non-industry funded efforts with diverse scientific sourcing is more biased than those working within the animal agriculture industry casting doubt, delay, and largely the status quo. There indeed is increasing investment in innovative alternative proteins, and the movement does need to ensure financial bias does not affect scientific integrity, but animal agriculture proponents rarely ever put the financial bias in perspective (animal-sourced food production vs. Alternatives protein for funding, subsidies, grants, etc).[75]

Investment in plant-based meat delivers the biggest emissions cuts of all sectors

Billions of tonnes of CO2 equivalent saved per $1 trillion invested



Sourced from The Guardian based on the Boston Consulting Group Report

Funding Put in Perspective

Between 2015-2020, financial institutions gave over $478 billion to meat & dairy corporations globally.[76] Between 2010-2020, plant-based food, cultivated meat, and precision fermentation companies, all of which would significantly reduce land pressures, received just $5.9 billion in investments.[77]

That doesn't include subsidies. Worldwide, more than US$200 billion of public money (money collected through taxes) is given to farmers - disproportionately for raising animals or commodity feed cropping - every year in direct transfers.[78] Other recent estimates show the agriculture sector, explicit subsidies in countries with available data, total US$635 billion per year but a true global number likely exceeds US$1 trillion.[79] These aren't restoring the planet. A 2021 report found almost 90% of global farming subsidies are harmful.[80,81] The UN agencies behind this report state that this agricultural support results in damage to people's health, subsidizes the climate crisis, destroys nature, and drives inequality by excluding smallholder farmers, many of whom are women. The handouts disproportionately prop up beef and milk produced by large industrialized groups.[82,83]

In the United States, Tyson has spent double what Exxon has on political campaigns, and 33% more on lobbying relative to revenue. The top 10 meat and dairy companies and six largest trade associations, in the US alone, have spent over $330M just on lobbying related to the environment since 2000.[84]

For perspective, protecting just 30% of mangroves and forests alone would prevent the loss of $170 billion to $534 billion per year.[85] Without a doubt, a shift away from animal-sourced foods that uses 83% of all farmland - equivalent to over the size of Africa - is our best option for protecting and restoring more wild ecosystems that offer the best opportunity to draw down carbon and restore biodiversity.[86,87,88] More good news is, when animal agriculture industry degraded land is allowed to rewild, even on its own with no hands-on restoration, carbon stocks and biodiversity loss can often rapidly approach pre-disturbance levels.[89,90,91,92]

UC Davis CLEAR Center and New Methane Math

Some professors get paid far more from industry than their own university, and universities benefit since these individuals can also bring in additional university funding.[93] The Clarity and Leadership for Environmental Awareness and Research Center (CLEAR Center) at the University of California, Davis, directed by Dr. Frank Mitloehner is an example. The center was funded by a $2.9 million grant from IFeeder, the non-profit arm of a livestock industry group. The center's main goal is to publish and promote research that increases the efficiency of animal agriculture, especially beef. The center's messaging and research are used by industry groups to downplay the environmental impact of meat production.[94]

GWP*, a metric that the animal agriculture industry, and the CLEAR center, is heavily lobbying to use to escape historical impacts of methane,[95] was recently used to claim Brazilian beef has lower emissions than cultivated meat (Case Study 1) in the same study co-authored by Frank Mitloehner.[96] In this comparison they ignore the large negative emission term that would be delivered on a GWP* basis if a switch to cultivated meat allows a reduction in methane emissions, which it would. The framing further leads to a more typical greenwashing tactic as the carbon drawdown opportunity for Brazilian land that could be rewilded is not considered,[97] and cultivated meat is assumed to be powered by fossil fuels hundreds of years into the future.[98]

GWP* is not only being expressed as a way to measure methane going forward, but in this scenario in Mitloehner's new research, it is claimed that minor methane mitigations result in cooling. Claiming in effect that the dairy industry is fighting climate change. A claim which could be described as climate disinformation.

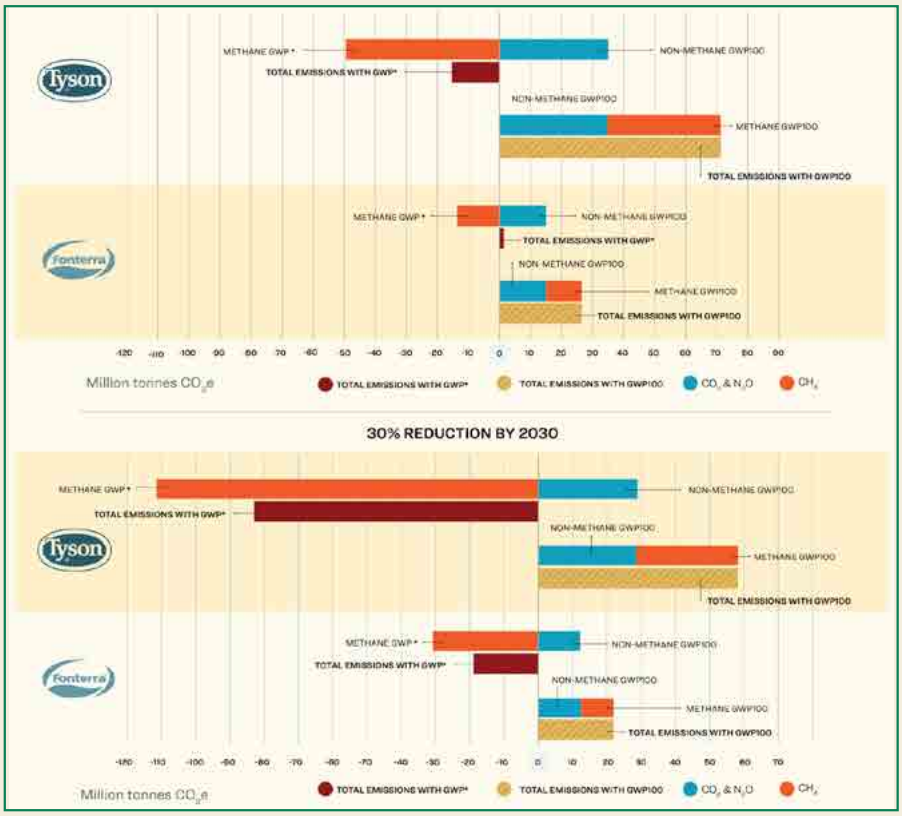
"Marion Nestle, the acclaimed food writer and a visiting professor at Cornell, likened the centre's model to "the tobacco industry playbook". "[The CLEAR Center] is following rule #1: cast doubt on the science," she said. "That's all it has to do to get people to ignore current science and recommendations." "The tobacco industry was brilliant at delaying public policy on cigarette smoking. CLEAR is doing the same thing. It's great that its efforts are being exposed.""[99]

The implications of their campaign on GWP* are profound. They falsely claim the entire dairy industry in California can start claiming to be cooling the planet with slightly more than 1% reductions in emissions per year.[100]

The biggest methane polluting industry in the world, through lobbying, is attempting to change how their emissions are measured too.[101] This new Changing Markets report - along with reviews from an IPCC lead author and many senior climate scientists - analyzes the technical aspects of this new metric and exposes the industry ploy to escape basic climate accountability.

Dr Frank Mitloehner
Photo: The CLEAR Center, UC Davis

15% Reduction by 2030



If lobbying attempts are successful, countries like New Zealand who have disproportionate impacts from methane and dairy farming, could falsely claim to be pulling carbon out of the air simply with 10% reduction in methane by 2038. Tyson (the second biggest meat producer in the world) and Fonterra (the world's biggest dairy exporter) could claim climate neutrality with tiny annual emissions reductions of 1.4% and 1.7%, respectively.[102]

In the US, meanwhile, the National Cattlemen's Beef Association – a trade group representing cattle farmers and meat companies like Tyson and McDonald's – has used GWP* to argue that American cattle "may not be contributing much at all to global warming". It adds that it's working with the International Beef Alliance – made up primarily of meat trade associations from North America, Latin America and Australasia – "to ensure that everybody is working towards adoption of GWP*".[103]

A strong body of scientific literature shows that we need to transform our food system to healthy plant-based diets, where appropriate. This will be a win-win strategy for climate, biodiversity and health. Corporate attempts like this to escape accountability by delaying, distracting and derailing urgent climate action should not be accepted.

LEARN MORE:

- Seeing stars: The new methane metric that could allow the meat and dairy industry to avoid climate action. Changing Markets.
- GWP*: How the Meat & Dairy Industry is Pushing for a Methane Reporting Tool That Enables Greenwashing. Green Queen.
- New York Times: He's an Outspoken Defender of Meat. Industry Funds His Research, Files Show: A UC Davis professor runs an academic center that was conceived by a trade group, according to records, and gets most of its funding from farming interests.
- Unearthed: Revealed: How the livestock industry funds the 'greenhouse gas guru'
- Documents reveal how the CLEAR Center at UC Davis, a research institute run by Frank Mitloehner, has become central to the agricultural sector's PR and lobbying efforts

> *"Conservatives seized upon the strategy of "manufactured uncertainty" that had been effectively employed for several decades by corporations and entire industries, most notably the tobacco industry, in efforts to protect their products from regulations and lawsuits by questioning the adequacy of evidence suggesting the products were hazardous. . . . Over time, manufacturing uncertainty has evolved into "manufacturing controversy." To accomplish this, corporations . . . have supported a small number of contrarian scientists (many with no formal training in climate science) . . . creating the impression that there is major debate and dissent within the scientific community over the reality of anthropogenic climate change."*[104]

Dunlap & McCright, 2015, pp. 306–308 from "Cowgate" Meat eating and climate change denial Vasile Stanescu

*Cash Rules Everything Around Me

Professor Daniel Goldberg's satirical Conflict of Interest (COI) Bingo card lists the rationales commonly used to justify financial ties to industry. These justifications ignore the large body of research demonstrating the profound influence of industry funding on the design, interpretation, and outcome of research. The word "CREAM" in the center Free Space stands for "Cash Rules Everything Around Me," a reference to an iconic 1993 rap song by the Wu-Tang Clan.

The marketing budgets of the animal agriculture industry are in the 100s of millions or even billions. McDonald's alone has a marketing budget of approximately 400 million dollars USD. Paying researchers is an inexpensive part of marketing plans.

Scientists face significant societal and individual pressures. Their aspirations for successful careers align with universities' desires for private and public partnerships and funding. The system rewards those who secure grants, publish their work, and contribute to the field, provided these achievements are obtained ethically and without financial and confirmation bias. Herein lies the issue which requires substantial efforts to reverse.[105]

> *"For too long we have allowed a culture of (funded) climate silence to dominate in our universities, leading to a misalignment of our priorities from our core purpose and values, thereby perpetuating a maladaptive response to the unfolding planetary emergency and undermining the very future of the higher education sector. Universities have in effect become 'fraud bubbles' (Weintrobe, 2021) in which staff and students must construct a 'double reality', in order to pursue a narrow social role, trapped in maladaptive incentive structures of increasingly neoliberal institutions… Many universities even continue to conduct research into new fossil fuel exploration and extraction (and animal agriculture), some of it directly funded by industry, despite the conflicts of interest such funding is known to cause (Franta and Supran, 2017; Corderoy, 2021; Almond et al., 2022)."*[106]

Skip to solutions to address funded experts

Amplified Astroturfing

Astroturfing can generally be defined as "fake grassroots organizations usually sponsored by large corporations" or other for-profit or politically-motivated funders.[107] Serious ethical and societal concerns underline astroturfing practices, especially if corporations are successful in influencing public opinion by undertaking a social movement approach. Astroturfing is when an entity artificially creates an impression that there is widespread sentiment in favour of or against a product, policy, or concept, when in actuality no such sentiment exists, at least not to the extent imputed.[108] Astroturfing tactics are becoming increasingly sophisticated, effective, and dangerous.

"With the rise of the internet, astroturfing practices increased exponentially. The internet provides a low-cost, efficient and anonymised way to disseminate a huge amount of information within a short period of time." Chan, J. (2022)[109]

Instead of expending resources on hiring many actors for an in-person protest (Classic Astroturfing), a company can opt to engage someone with basic programming skills. This individual can then generate millions of fabricated social media accounts. These fabricated identities can exhibit a wide range of diversity, encompassing variations in age, gender, ethnicity, income levels, geographic locations, and political affiliations. While some of these accounts are directed by human agents, determining content and actions, others are managed by automated algorithms known as 'social bots', which endeavor to replicate genuine human behavior. Some of these bots undertake basic tasks like 'liking' or 'retweeting' from specified users or posting prearranged messages.[110]

The latest iterations of social bots have grown more sophisticated, capable of engaging organically with real users on social media. This transformation facilitates businesses in creating the illusion of numerous independent customers 'liking' a photo of their latest product with minimal effort, or enables political parties to employ thousands of seemingly genuine accounts for the purpose of 'sharing' unfavorable news about their rivals.

Astroturfing: Last Week Tonight with John Oliver (HBO)

Six Hallmarks of Astroturf:

- Well-funded from the start with little visible citizen support.
- Use of generic or "populist-sounding" names for campaigns (e.g., Citizens for X, Save the X, Families for X, Consumers for Freedom).
- Coordinated email campaigns sent to legislative offices from unverified constituents or without consent.
- Noticeably biased campaign-centric websites.
- Inflammatory language to support claims.
- Campaign websites claiming to educate by debunking industry myths.

Ten Common Astroturf Tactics:

- Flooding social media with comments and content under multiple pseudonyms, often aided by software.
- Organized posting of comments on the Federal Register to influence public policy.
- Around-the-clock monitoring of influencers to deploy rapid response counter-measures. (e.g. Master of Beef Advocacy)
- Controlling topics and pages on Wikipedia to serve their interests.
- Training analysts to appear in media, pitch stories, and leak information to the press.
- Writing and placing news articles, blogs, and ghostwritten letters in national publications, often in frequent cycles (Seaweed, Seaweed, Seaweed).
- Facilitating scientific studies with industry influenced results to confuse the information landscape.
- Hiring scientists, doctors, and researchers to advocate with desired results, often without disclosing financial interests.
- Boycotts organized by linked advocacy groups and nonprofits, not driven by ordinary consumers.
- Assuming the identity of the opposition to conduct controversial acts and blame them publicly.

AI and chatbots have amplified this whole strategy and it's visible in the polarizing and business-as-usual popularity that's increasing. The practice of astroturfing is one of the most dangerous disinformation tools because it targets the human social instinct that looks to be part of a group and reach a consensus with our peers or conform to social norms, which can eventually lead to more insidious groupthink.

Case Study: How Richard Berman Fought Tobacco Regulation

Richard Berman was funded initially by Philip Morris and Philip Morris International Inc. (PMI) - an American multinational tobacco company with products sold in over 180 countries - to establish his organization, Center for Consumer Freedom in 1995.[111] It's been run under a number of names and astroturf organizations, including more recently Center for Organization Research and Education. The objective was to unite the tobacco and hospitality sectors to combat excessive regulation, especially smoking bans in restaurants. Now the group shifted its focus to food-related matters, and it has since received substantial financial support from the food and restaurant industries. Richard has made a career out of astroturfing.

As indicated by federal tax records, Berman allocated $763,994 for an "educational campaign" in 2019, which included twelve advertisements, paid media, and a website. In 2021, the most recent year for which data is accessible, expenditures amounted to $724,706.

Citizens for Responsibility and Ethics (Crew), a Washington, DC-based advocacy organization that focuses on corporate monetary influence in politics, asserts that Berman's nonprofit entities pose as impartial authorities aiming to educate the public, yet in truth, they primarily function as fronts for Berman's industry clientele.

The Center is a tax-exempt non-profit and does not have to disclose its funders list but below are suspected funders[113]:

- meat giants (Cargill, Tyson Foods and Perdue Farms),
- soft-drink manufacturers (Coca-Cola), and
- fast food chains (White Castle, Outback Steakhouse).
- More: Source Watch.[114]

A list of astroturfing campaigns managed by CCF as of December, 2019, and more, can be found here.

These campaigns are far from unique to CCF, and other groups like the International Life Science Institute, a seemingly harmless American nonprofit organization with a generic sounding name, has discreetly penetrated governmental health and nutrition agencies across the globe. Unsurprisingly, they also started out in Big Tobacco, but also brought ties to Coca-Cola, Nestle, and other large agribusiness and pharmaceuticals, with disinformation efforts now mostly focused on food and nutrition. Unlike CCF, they are especially active in China, India and Brazil.

Photograph: Luke Sharrett/The New York Times/eyevine.[112]

The Plant-Based Jevons Paradox

In the context of new plant-based and animal-free foods, Jevon's Paradox warns that introducing environmentally friendly options without reducing and displacing animal-based food consumption may lead to higher overall resource use, potentially undermining sustainability efforts.[115]

Despite a substantial 9% surge in the price per pound for plant-based protein products in the US between 2019 and 2022, and a 4% annual uptick in wholesale prices within the broader distribution network, overall sales revenue for the sector in 2022 still managed to climb by 2% compared to the previous year. This is indeed lower than many plant-based market leaders predicted. Industry think tank Good Food Institute has long strategized that taste and price will be key to reaching more meat-eaters and expanding the plant-based market. New research highlights the additional, perhaps even bigger, importance of shifting cultural norms and defaults.[116]

How people and institutions change: DAMON CENTOLA: Creating Change: How To Make Big Things Happen - Stretch Conference 2021

Pressure from agricultural lobbies is affecting new animal-free foods' ability to even attempt to displace high impacting animal foods. You can now be fined up to £52,000 if you get caught developing cultivated meat in Italy.[117] This was a major win for the animal agriculture lobby, stopping science and innovation in its tracks, and blocking the alternative protein solution in the country. There are good reasons to be skeptical of cultivated meat in particular, but the pros outweigh the cons to at least explore as a feasible alternative to the status-quo. This puts in perspective the power of culture and identity, and politicalization of food, over science.

The US Beef Checkoff Program

Does the saying "Beef. It's What's for Dinner" sound familiar? This slogan came from a 1993 commercial that still resonates with many Americans. This campaign was masterminded by the Beef Checkoff Program, considered by some to be one of the most compromised structures within the American agricultural sector, including many small farmers and ranchers.

Once an optional contribution, the program is now a compulsory tax that U.S. farmers and ranchers are required to pay when they sell specific commodities. Since its inception in 1985, the beef checkoff program has amassed over $1 billion in fees (the program takes $1 on each live cow sold).[118] This is managed by the Cattlemen's Beef Board (CBB), which oversees this government program and directs most funds to the National Cattlemen's Beef Association, a lobbying organization representing corporate meatpackers like Cargill, Tyson, and National Beef, created to respond to market challenges and encourage everyone to eat more beef. There's also a Pork Checkoff Program that requires producers to pay 35 cents for $100 of live pigs sold with equal motivations.

Retrieved from https://www.cobeef.com/cattlemens-corner/resource-main-page/beefindustryresources-advertising

New York Times Publishes An Example of The Beef Checkoff Program Disinformation

This New York Times advertisement claims that cattle enhance butterflies and deer without providing any evidence, a thinly-veiled ploy to suggest that cattle grazing increases biodiversity. The animals listed do not rely on grazing and in fact most native animals and flora have been displaced by grazing.

A recent meta-analysis out of the University of Alberta published in Ecology Letters looked at 109 studies on the response of animals and plants to different types of livestock grazing vs. exclusion (unmanaged rewilding). They concluded: "Across all animals, livestock exclusion increased abundance and diversity."[119]

This comparison, along with others, shows that ecosystems with extremes in low precipitation or high temperature (e.g. deserts) can be particularly impacted by grazing which can further damage soil characteristics, reducing already limited plant biomass, and decreasing animal diversity.

Some better soil health, but not compared to rewilding.[120]

Agricultural land retains 25-75% less soil organic carbon compared to rewilded native landscapes.[121] While extensive pastureland may offer increased biodiversity over intensive farming methods, the most accurate comparison pits pastureland against native wild ecosystems nearby. Transitioning to a plant-based food system would liberate over 75% of agricultural land for rewilding enhancing biodiversity and feeding more people.[122,123]

Mainstream media is contributing to the global crisis of disinformation by accepting money to promote propaganda like this with little to no scientific backing.

Skip to Social Media Manipulation

Full Page spot in the New York Times with QR code going to: https://www.beefitswhatsfordinner.com/raising-beef

The biggest difference between the fossil fuel industry's greenwashing and that of animal agriculture is that, through the Beef Checkoff Program, downplaying impacts are paid for from a pot of public funds to which all beef and pork farmers and ranchers are required to contribute (and whose messaging they all benefit from).

It's not just the environment, recent campaigns are directed at medical professionals:

Look familiar?

Retrieved from https://www.beefboard.org/2023/08/14/beefs-advantages-take-center-stage-in-doctors-offices/

Taft (2022) - The Beef Industry Is Trying to Sell Us Bullshit: Like the oil and gas industry once did, Big Meat is slowly ramping up its PR spin on climate.

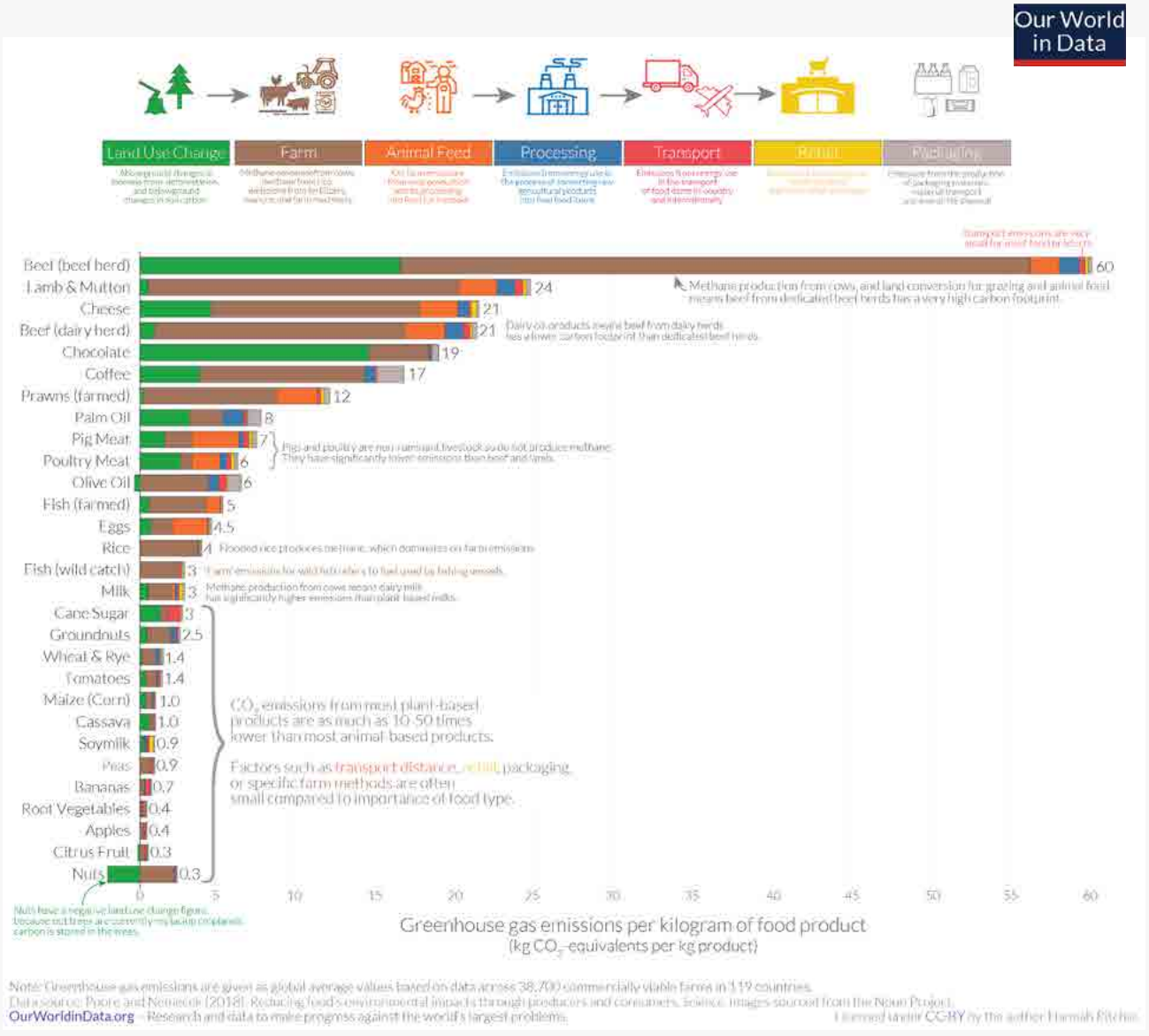
In the near future, bigger and more nefarious campaigns are planned: the Cattlemen's Beef Board (CBB) is planning to allocate approximately $38 million for various programs related to beef promotion, research, consumer information, industry information, foreign marketing, and producer communications in fiscal year 2024, pending approval from the USDA, which is unlikely to push back much given recent collaborations like the low-carbon beef alignment.[124]

The Beef Promotion Operating Committee (BPOC) has already approved checkoff funds for 12 grant proposals for the fiscal year starting October 1, 2023. These grants will be distributed among eight national beef organizations as follows:[125]

American Farm Bureau Foundation for Agriculture	$800,000
Cattlemen's Beef Board	$1,800,000
Foundation for Meat and Poultry Research and Education	$500,000
Meat Import Council of America/Northeast Beef Promotion Initiative	$900,000
National Cattlemen's Beef Association	$25,405,000
National Institute for Animal Agriculture	$60,000
North American Meat Institute	$330,000
United States Meat Export Federation	$8,150,000

In Europe, the ads are equally misleading, promoting a local-means-environmentally-friendly story misleading on full environmental comparisons. The location of food makes up less than 10% of its environmental footprint.

Food: Greenhouse Gas Emissions Across The Supply Chain



What matters most is what is produced, and if it's contributed to methane, deforestation, and water and air pollution in particular. Animal-sourced foods lead these impacts.[126]

Sourced from Meat from Europe campaign funded by the European Union

Sourced from Greenpeace

Downplaying Impacts

Animal agriculture companies have been actively working behind the scenes for decades to prevent discussions about reducing meat consumption from being included in climate policy talks. The initial version of the 2021 Intergovernmental Panel on Climate Change's (IPCC) report on climate change mitigation suggested transitioning to plant-based diets and sustainable agricultural systems. However, delegates sent by former Brazilian President Jair Bolsonaro, whose term saw extensive burning of his country's precious Amazon rainforest, partly driven by beef producers, successfully lobbied to have that recommendation removed from the report.[127]

The meat lobby employs a highly effective strategy of using creative accounting methods to obscure the climate impact of meat production.

To quantify emissions, climate scientists use a metric known as global warming potential (GWP), which converts various greenhouse gases into a single figure called carbon dioxide equivalent (CO_2e) due to their differing strengths. Gases like methane contribute significantly to rapid heating but break down in the atmosphere, causing GWP to vary depending on the time frame considered. For example, over 100 years (GWP100), the global warming potential of methane from non-fossil sources is 27 times that of carbon dioxide, whereas over 20 years, methane is approximately 79 times more potent than CO_2. Choosing longer term metrics downplays methane, as does more niche but increasingly deceptive ones like GWP*, a metric that is riddled with unethical issues, effectively treats stable methane sources as causing no warming, and is used by some of the world's biggest methane polluters for greenwashing purposes.[128,129,130,131,132]

Source images: rawpixel.com (cow, meat, background) via Fast Company

US EPA Underestimation

In the US, individuals like Frank Mitloehner from UC Davis CLEAR Center point to domestic emissions sources (source: EPA) and say agricultural emissions are only 9% of total US emissions, and livestock are only 3.9%, asking: why eat less meat, when energy use is a much bigger piece of the pie?

CLAIM: "Currently, emissions from cattle, including those that come from the feed production, fuel, and electricity only account for 3.7% of the total greenhouse gas emissions in the U.S" https://www.beefitswhatsfordinner.com/raising-beef/beef-sustainability

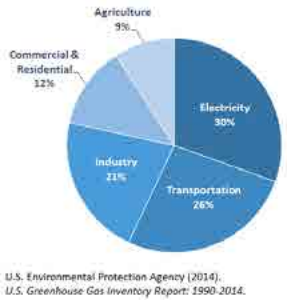
Unlike this Beef Checkoff Program ad that ran in major media outlets, climate experts would not describe beef as a sustainable food, but as a climate problem. For each kilogram of beef produced, nearly 60 kilograms of greenhouse gasses are released. While impacts are indeed on a spectrum with animal-sourced foods in terms of method and location, in comparison, wheat releases less than 2 kilograms of greenhouse gasses per kilogram produced, and even the most high-impacting plant proteins are far lower than any animal-sourced food's greenhouse gas emissions' footprint.[133]

But the GHG pie chart above does not include the global land use consequences of continued elevated US meat consumption. And because food is a global commodity, what is consumed in one country can drive land use impacts (e.g., deforestation) in another.[134]

A recent study showed that in the hypothetical scenario where the world shifted g to plant-based diets and land used for animal agriculture was freed up (over 3 billion hectares), we could draw down the equivalent of 9-16 years of current fossil fuel emissions, while feeding more people (about 3.5 billion more according to the estimates given).[135,136]

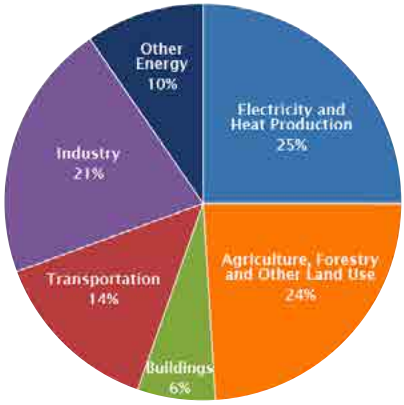
In more realistic scenarios, the World Resources Institute estimates that if the average person in the US ate one-third less beef, and replaced those foregone calories with legumes, their per capita diet-related GHG emissions from agricultural production would go down by about 0.3 tons CO_2e/year[137]. Notice also that the beef-to-legumes shift reduces agricultural land demand by 0.14 hectares/capita/year. So, if you scale that across the whole US population, this diet shift would free up about 45 million hectares of land - larger than the state of California.[138]

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2014

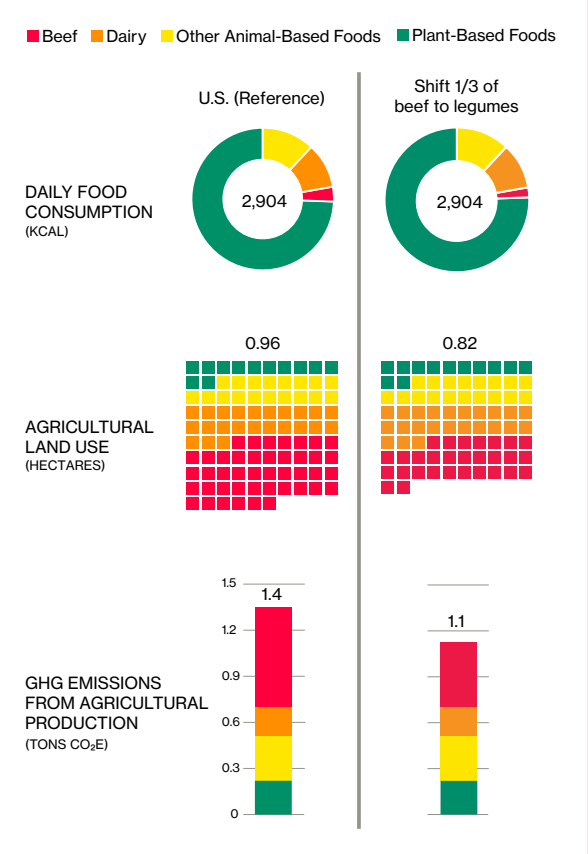


U.S. Environmental Protection Agency (2014). *U.S. Greenhouse Gas Inventory Report: 1990-2014.*

Global Greenhouse Gas Emission by Economic Sector

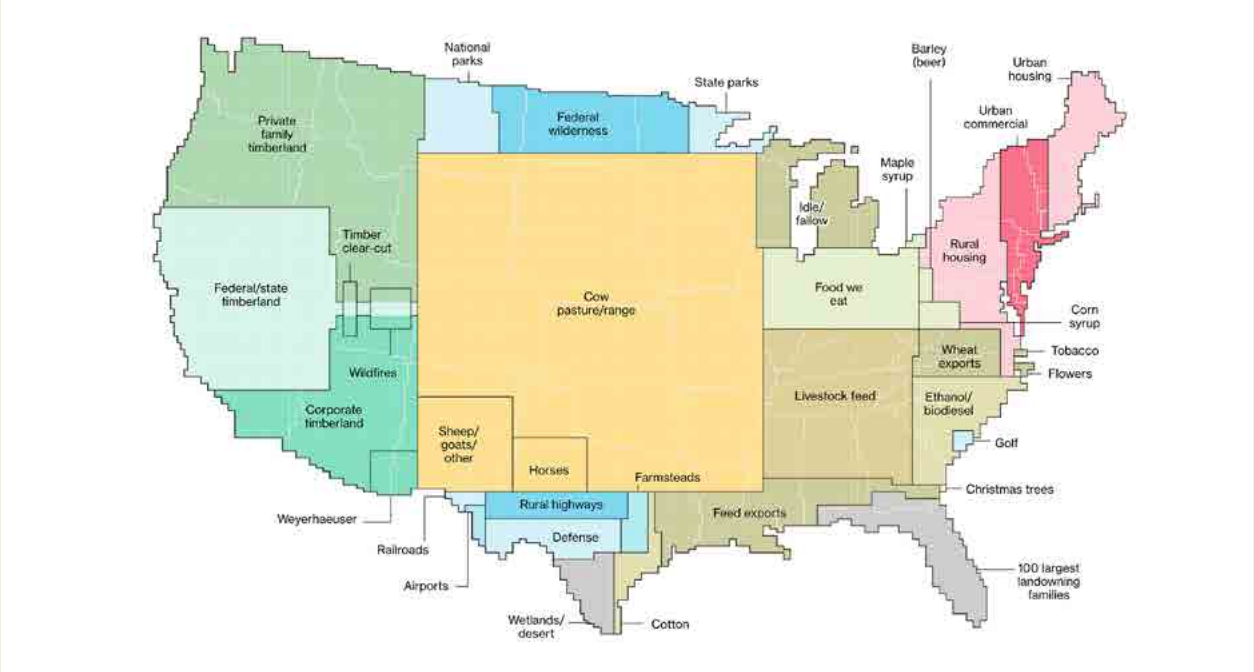


Expansion of pasture lands for beef production is one of the leading recent drivers of tropical deforestation.[140]
What if a California-sized area of land was no longer needed to be converted to agriculture?



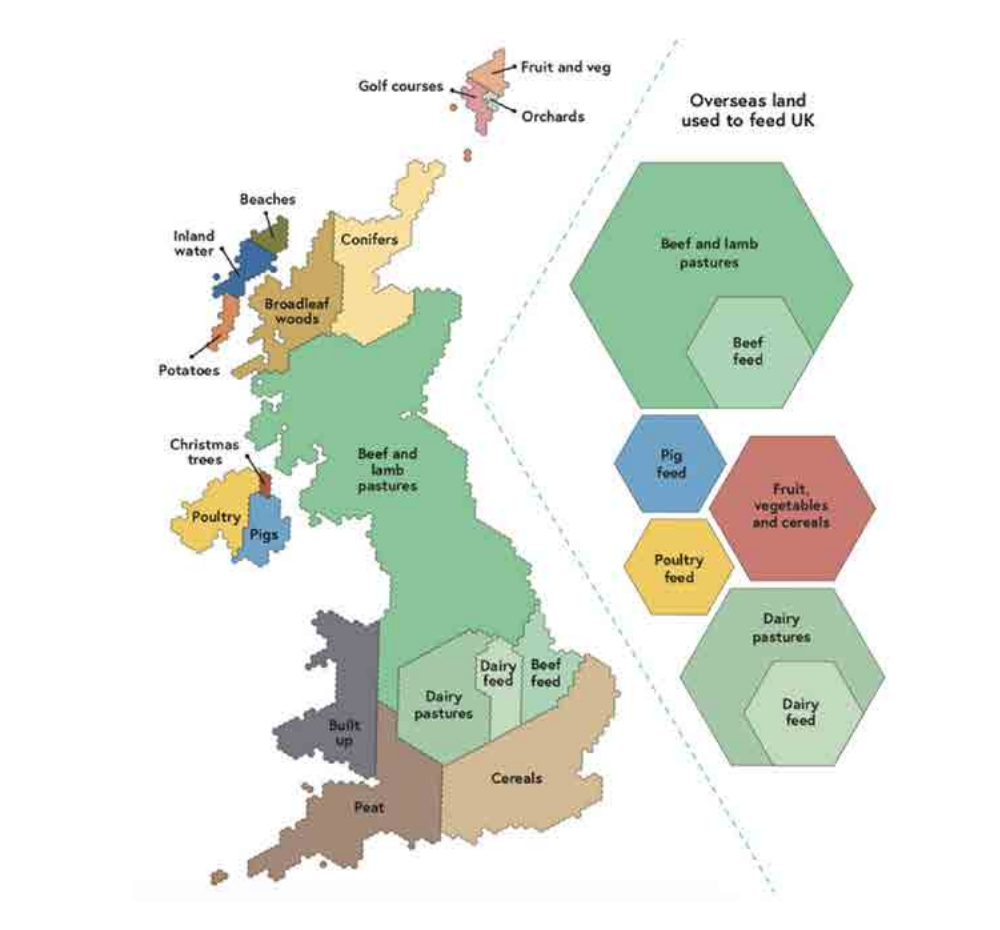
WRI graph from http://wri.org/shiftingdiets[139].

What if we changed how land was used in the US?



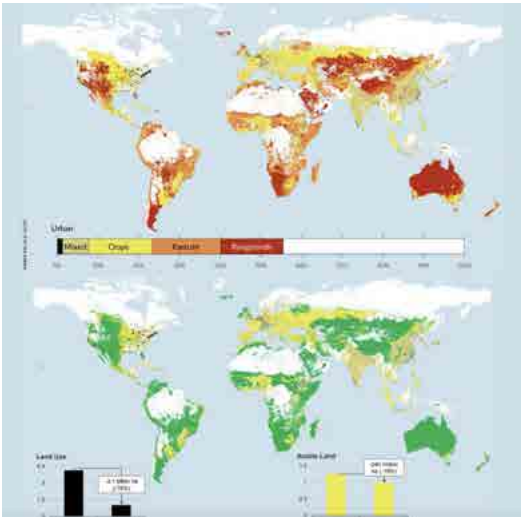
Graphic from Bloomberg: Here's how America Uses Its Land

What if we changed how land was used in the UK:



Source: Figure 9.3 from the National Food Strategy

What about globally?



Source: Poore & Nemecek, 2018 (slide part of Poore's talk on the Cambridge Climate Series)

An overarching issue in many western countries is that the agencies that are supposed to oversee and regulate industry impacts (like the USDA), often help promote the greenwashing and have far too close industry ties.

Lastly, the downplaying of impacts extends beyond food and is also pervasive in fashion with false dichotomies failing to show full scope of better eco-friendly plant alternatives. Australian Wool Innovation Limited launched this campaign claiming wool is a 100% natural, renewable and biodegradable fiber. While it may be considered natural, for what value that term has, it is far from renewable, biodegradable, or sustainable according to an analysis by Feldstein et al. (2022).[141] There are also many non-fossil fuel derived materials that are far more ecologically healthy than wool or leather.[142]

Sourced from Collective Fashion Justice.[143]

Animal derived clothing has an outsized environmental impact relative to even synthetic materials, but indeed the future solution is reducing overconsumption and sourcing sustainable plant fibers.[144]

Learn more about others cases of downplaying impacts:

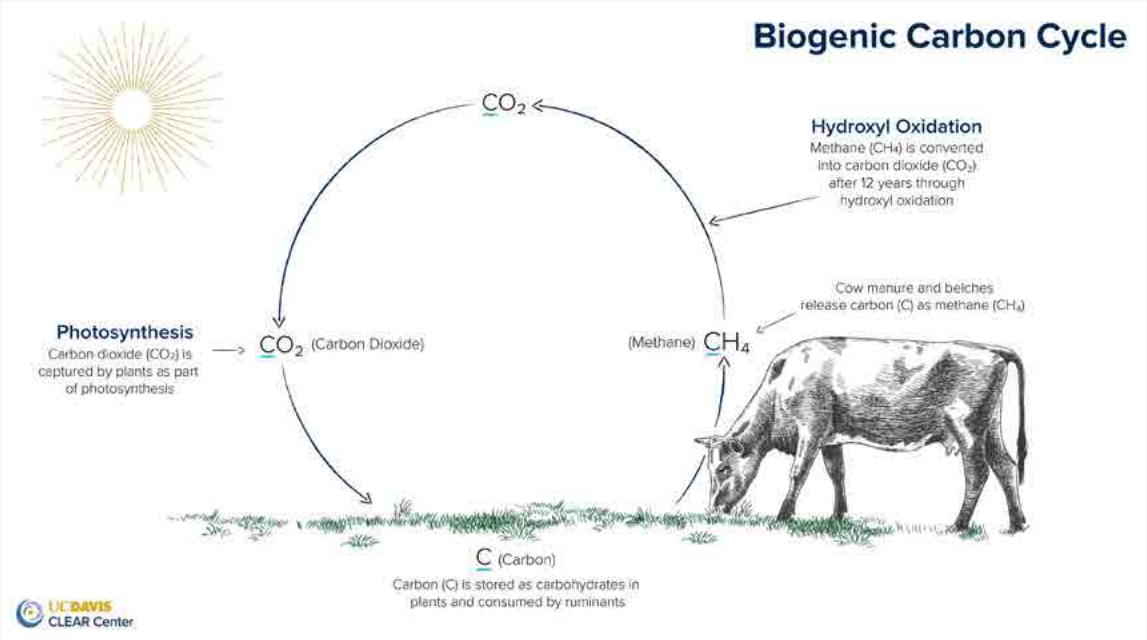
- National Pork Council
- National Cattlemen's Beef Association (NCBA)
- Tyson Foods Climate Denial
- Desmog Agribusiness Database

Downplaying Methane

A significant aspect of the agriculture sector's strategy seems to involve redirecting focus towards methane emissions originating from the fossil fuel sector. However, the meat industry has employed another key tactic that portrays methane emissions in farming as 'natural' occurrences.[145,146]

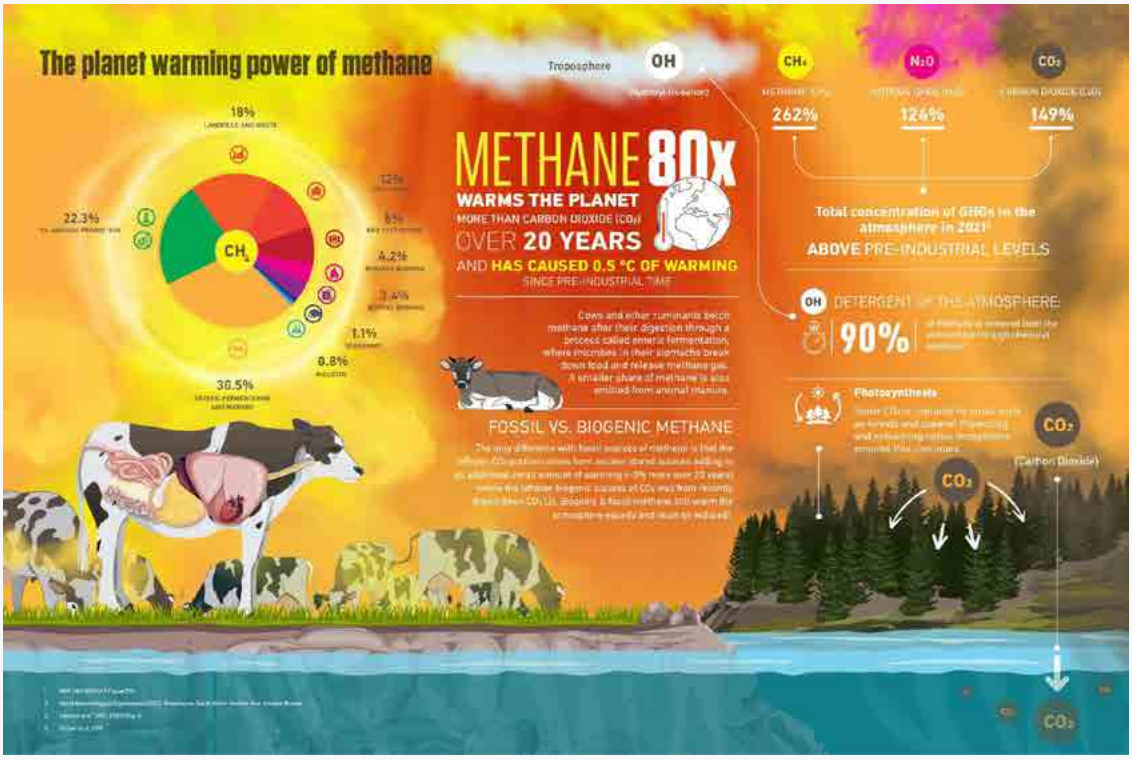
CLAIM **BIOGENIC METHANE DOESN'T MATTER**

Industry funded professor Frank Mitloehner was featured on a Pork Checkoff webinar advocating for methane to be counted differently than it is currently.



Sourced from the CLEAR Center

Here's the reality:



Sourced from Carter & Urbancic (2023).[147]

As the IPCC AR6 WGIII report makes it clear:

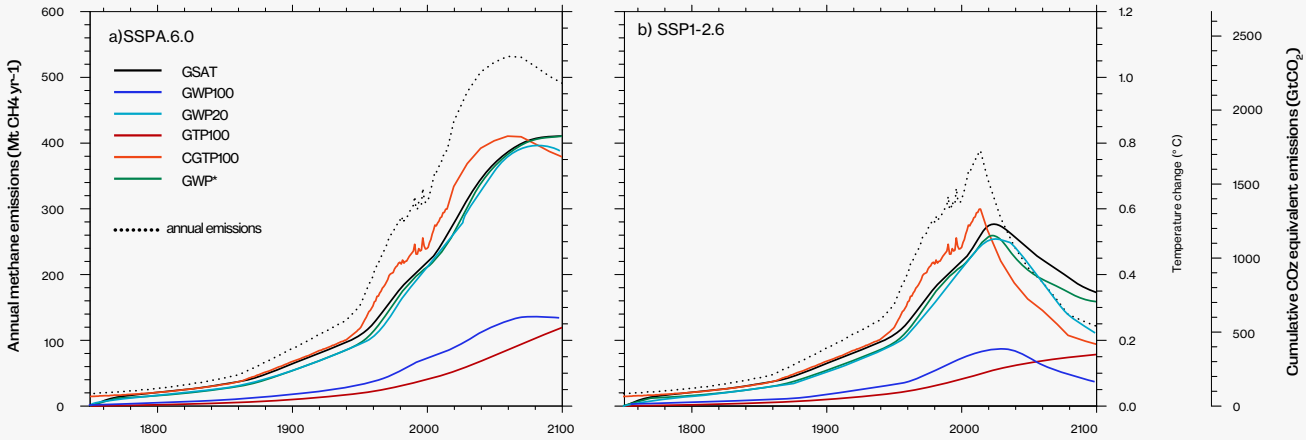
> *"...increasing numbers [of livestock is] directly linked with increasing CH_4 (methane) emissions... continued global livestock population growth between 1990 and 2019, including increases of 18% in cattle and buffalo numbers, and 30% in sheep and goat numbers, correspond[s] with CH_4 emission trends".*[148]

This has resulted in animal agriculture responsible for at least 32% of all human-caused methane emissions. Over the next decade, warming from methane will be almost equal to warming from carbon dioxide.

In measuring global warming from methane a hundred years ago (1850-1900) relative to the past decade (2010-2019), new research also cited in the Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report (AR6) working group 1 (WG1) report shows as much as 0.5°C of the 1.1°C of global net warming to date is from methane.[149,150] Estimates showing almost half of warming from methane would take into account the cooling effect of reflective aerosols that are primarily co-emitted along with CO_2 during coal and diesel combustion, or consider methane contributions to warming by 2050.[151] Other estimates put it at about 25-30% of warming to date.[152] Measuring methane over 100 years devalues it by about 2 times. This shows how easy it is to manipulate the data and downplay impacts for financial motives.

Ultimately, warming from methane (CH_4) will equal warming from CO_2 over the next 20 years, and reducing methane levels is our best chance at reducing atmospheric effects in the short term and has been shown to track warming well.[153]

Warming equivalence of cumulative emissions



Sourced from Carter & Urbancic (2023).[154]

If all cattle's greenhouse gas emissions globally were counted together, they would rank 3rd behind China and the United States among the world's largest greenhouse gas emitters.[155]

- China (2019): 12.1 billion tonnes CO_2e
- United States (2019): 5.8 billion tonnes CO_2e
- Cattle (~2010): 5.0 billion tonnes CO_2e[156]

Feedlot photo: Farm Transparency Project | CC BY 4.0, Calf photo: Cifer88 | Pixabay

Methane is methane, no matter the source. The claim that methane from cows is a normal part of the carbon cycle is part of a disinformation campaign amplified by popular documentaries and beef associations.

How we know methane from cows affects the atmosphere:

- We can see the methane build up in the atmosphere, much of it with a biogenic (not fossil) isotopic signature. We know much of it's from cattle.[157]
- In November 2022, UNEP and IMEO launched the Methane Alert and Response System (MARS) to enhance detection of methane super emitters, alert relevant stakeholders, and support and track methane-mitigation progress.
- GHGSat (2 March 2022) Cow burps seen from space: a press release dated March 2nd 2022 stated that high-resolution satellites owned and operated by GHGSat, the environmental data company, detected methane (CH_4) emissions coming from an agricultural area in California's Joaquin Valley. This highlights the importance of tracking greenhouse gas emission from cattle farming, and the ability to do so even from space."

Physical laws of atmospheric science are indifferent to whether methane emissions are natural or not. The claim that emissions from cattle are natural usually includes mentioning the carbon cycle. While a minor portion of the carbon in cattle-emitted methane comes from consumed grass, it does not imply that all of it is seamlessly cycled in nature nor says anything about the warming power of methane.

Downplaying the Food Waste Inherent in Raising Animals for Food

Food waste is a serious global issue: over 30% of all food produced globally is wasted each year. Often missing from this narrative is the human edible food loss that occurs when converting food crops to meat which, if instead redirected to human consumption, would increase available food calories by as much as 70%.[158]

Even when feeding grains or soy to chickens, the most efficient at converting feed to meat, the conversion ratio is around 4:1, which means that for every four units of feed protein, we only get one unit of edible animal protein. Further, ruminants have much lower conversion ratios, ranging between 10:1 and 20:1.[159]

There are claims that farmed animals are better at converting feed to meat. How does misinformation spread on this topic?

One method is that the meat industry uses live weight feed conversion ratios:

- Live weight Feed Conversion Ratios (FCRs) typically present lower ratios, as they account for the amount of feed animals consume to gain one pound while alive.
- Edible weight FCRs, on the other hand, generally indicate higher ratios, as they more accurately reflect the quantity of ready-to-consume meat produced after slaughter and processing.[160]

With edible weight, variations such as carcass/hanging weight and final/take-home weight further complicate the picture. For instance, the final weight for pigs and cows is roughly half and one-third of the live weight respectively, thereby significantly increasing the inefficiency ratios, even more so when considering boneless cuts.

A large portion of the calories consumed by animals are used to support their metabolism and to build non-edible components such as bones, cartilage, and feathers. This means that inefficiencies multiply when liquid weight – the weight of water, blood, and other bodily fluids – is discounted. Additional weight loss occurs with the removal of bones and other non-consumable parts.

The food industry frequently discloses lower-end FCRs, thereby downplaying the extent of waste. Those without a stake in animal agriculture, or those critical of the industry, are more likely to publish higher, and arguably more accurate, post-processing carcass or boneless figures.

FCRs will vary even if the method remains constant. This variance results from factors such as feed type/quality/moisture, animal age, breed, activity level, number of offspring, among others.

While much emphasis is placed on improving these factors to reduce inefficiencies, the inherent waste associated with routing crops through animals persists. Altering these factors only slightly reduces the numbers without addressing the fundamental problem that using animals as a source of food results in a significant net loss of available global calories and protein.

Indeed, it is revealing that a 2:1 loss of food crops is viewed as highly efficient and a cause for celebration. In a discussion about food waste, would we classify losing half of all crops as “good?”

LEARN MORE:

- A Well Fed World

Meat Advertising Like Fossil Fuels

In a similar vein, the animal agriculture industry (like JBS here) today seems to be going down the same path as these oil giants. The sector is increasingly under scrutiny for its significant environmental footprint, which includes greenhouse gas emissions, deforestation, water pollution, and biodiversity loss.[161] Despite mounting scientific evidence pointing to the need for a global shift towards more sustainable, predominantly plant-based diets, many within the industry continue to promote a narrative downplaying its environmental impact.

Read: Washington Post: The meat industry is doing exactly what Big Oil does to fight climate action | Jennifer Jacquet

Just as with the fossil fuel industry, this misrepresentation serves to delay necessary change and perpetuate harmful practices. If the precedent set by the oil industry is any indication, the animal agriculture industry may soon face legal consequences of its own (skip to legal accountability). As public awareness grows of the link between diet, animal agriculture, and environmental breakdown, calls for accountability are likely to increase. The lessons from the oil industry's travails are clear: industries causing significant environmental harm cannot escape responsibility forever.

There are also examples whereby greenwashed versions of animal agriculture (e.g. regenerative ranching) are being funded by the biggest oil and gas companies in an attempt to offset their impacts, when the ranching industry can't even offset their own.[162] McDonald's and Cargill are two companies funding such campaigns.[163]

LEARN MORE:

- The oil industry is funding a research collaboration with cattle ranchers operating in deforested areas of the Amazon to increase soil carbon stocks in pasture and claiming this counts as a 'climate solution'.
- Read: The Meat Industry Is Advertising Like Big Oil. But they're using public funds to do it.

Fossil Fuels and Industrial Animal Agriculture Partnerships

RESEARCH ARTICLE

Effects of adaptive multiple paddock and continuous grazing on fine-scale spatial patterns of vegetation species and biomass in commercial ranches

Fugui Wang · Steven I. Apfelbaum · Ry L. Thompson · Richard Teague · Peter Byck

Acknowledgements We are grateful for the financial support from McDonald's, ExxonMobil and Foundation for Food and Agricultural Research (Grant award #514752) and the ranch owners of Cooper Hurst and Prentiss Fergusson for the permission to conduct the study on their ranches. We would also like to thank Patrick S. Daniels, Will Overbeck, Tyler O. Schwartz, Sheila J. McCabe, Brandon C. Moore, Kristin McElligott, and Jason Carlson for the field data collection and

The group started with a $500,000 grant from Shell Alberta in 2016 to do reconnaissance sampling to provide proof of concept that AMP grazing management improves ecological, water catchment and economic value, as his research showed in Texas.

Led by Yara Growth Ventures with participation from Chevron Technology Ventures, Jerry Yang, Tom Steyer and Kat Taylor

San Jose, CA, USA, June 22 2021 – Boomitra today announced an investment of $4 million, led by Yara Growth Ventures. Boomitra is working on accelerating carbon removal from the atmosphere on a global scale, through agricultural soils. It operates

Regenerative Agriculture

Regenerative agriculture is poorly defined, but it generally has come to be known as a way to improve soil via better forms of grazing, some even falsely claiming it can reverse climate change.[164] Offsetting methane and nitrous oxide from 4 billion farmed ruminants would require a 135 Gt increase in soil organic carbon in global grasslands, according to a new study in Nature.[165] For context of how regenerative agriculture that includes farming ruminants is problematic, consider that yearly grassland sequestration potential is only 0.6-2.2 Gt, it's time-limited and easily reversible.[166,167]

Instead, and counter to maintaining current animal-sourced food consumption and pretending we can shift to extensive grazing mixed with crops, by rewilding and restoring native land used for animal agriculture, we could draw down at least 8 Gt of CO2 per year in soil organic carbon and native vegetation while at the same time removing the number one source of methane and nitrous oxide emissions.[168]

Yet, Allan Savory, a former colonial Rhodesia military leader in Africa, has amplified holistic grazing and regenerative ranching after his famous 2013 TED Talk:

Since then, appearing in deceptive documentaries like *Kiss the Ground*, he also is a sought out speaker.

Allan Savory has a history of making outlandish statements, but even recently many question his statements. Savory gave the World Brahman Congress keynote in Paraguay on July 16th, 2022, where he:

- Made a joke about trading wife for prized bull;
- Claimed no scientist knows how to solve climate without cattle;
- Said he is the victim, like Galileo;
- Claimed national parks are in rough shape because there are no cattle there;
- Made doom and gloom comments of chemical meat and coal leather.[169]

Brief History of Allan Savory

Savory worked as a ranger for the British Colonial Service, one duty requiring tracking and shooting wildlife like elephants, hippos, and lions that were claimed to be causing problems for settlers. He claims to be responsible for the killing of 40,000 elephants as a colonial wildlife manager.[170] While of course he admitted his mistakes here, this still set some foundations for holistic grazing whose original name derived from the 'fence and cull' approach.

As the Zimbabwe African National Union overtook the white minority government, Savory was exiled and came to the United States, a grievance he would bear for the rest of his life.[171] In a 2015 blog for Regeneration International, Savory called the expulsion of Cliven Bundy for illegal grazing on Gold Butte National Monument an example of a "western ranching cultural genocide", echoing reactions to agricultural land reforms in post-apartheid South Africa.[172]

The "fence and cull" approach to wildlife management in Zimbabwe is widely attributed to Allan Savory, who developed the concept in the 1960s while working as a research officer for the Department of Game and Tsetse Control in Rhodesia (now Zimbabwe). The approach involved using fences to contain and control wildlife, and culling or hunting excess animals to prevent overpopulation and reduce competition for resources with livestock.

Savory's memoirs describe training Selous Scouts-style "pseudo-gangs" who retaliated against African resistance fighters, wearing blackface to blend in behind enemy lines in the bush.[173] While the history is complex, Black Zimbabweans view the Selous Scouts as a symbol of the oppressive and racist Rhodesian regime, which denied the majority Black population political and economic rights.[174,175]

Ultimately, this past work informed his current practices to a great extent, especially evident in the number of war and guerilla tactic references he still deploys as a replacement to scientific evidence.[176] Critically though, what does the evidence suggest about this current theory of change?

LEARN MORE:

- Apánii, Y., & Harun, T. (2023). Holistic Counterinsurgency: Allan Savory and the Golden Calf of Rhodesian Land Management. Branch out. https://branchoutnow.org/holistic-counterinsurgency-allan-savory/
- Roberts, S. (2023). Rhodesian Snake Oil: Genesis of the Regenerative Ranching Myth. Author Rise. https://www.authorrise.org/blogpost/18d58574-d5df-4b60-8328-4ce867182a1b

A troop of the Rhodesian SS (Selous Scouts) wearing blackface (source)

The Science of Savory's Holistic Grazing:

Allan Savory has stated: Holistic grazing would lower "greenhouse gas concentrations to pre-industrial levels in a matter of decades." report | Coverage[177]

He's also told a journalist: "You'll find the **scientific** method never **discovers anything**," which published in Range magazine. The scientific community, even many within the animal science industry perspective, have been critical of Allan Savory's claims:

- A 2022 meta-analysis of 22 studies by Hawkins, Venter & Cramer found holistic management had no effect on soil carbon or animal productivity and that "Claims about increased production and climate resilience with HM (Holistic Management) are unfounded based on farm-scale studies."[178]
- A 2021 meta-analysis of 91 publications by Su & Xu shows removing cows from the land entirely enhanced plant production and soil carbon storage across grassland worldwide.[179]
- A 2020 meta-analysis out of the University of Alberta published in Ecology Letters looked at 109 studies on the response of animals and plants to different types of livestock grazing vs. exclusion (unmanaged rewilding). They concluded: "Across all animals, livestock exclusion increased abundance and diversity." This comparison, along with others, shows that ecosystems with extremes in low precipitation or high temperature (e.g. deserts) can be particularly impacted by grazing which can further damage soil characteristics, reducing already limited plant biomass, and decreasing animal diversity.[180]
- A 2017 meta-analysis of 75 studies found "Holistic Planned Grazing does not improve production."[181]
- A collaboration between the University of Oxford, the Swedish University of Agricultural Sciences (SLU) and Wageningen University and Research (WUR), in their report (Grazed & Confused) in 2017 said "that the extremely ambitious claims that proponents of Savory's methods make are dangerously misleading"[182]:
  - "Only under very specific conditions can [grazing] help sequester carbon. This sequestering of carbon is even then small, time-limited, reversible and substantially outweighed by the GHG emissions these grazing animals generate."[183]
  - The maximum global potential (of carbon sequestered in these soils), in the most optimistic conditions and using the most generous of assumptions, would offset only "20-60% of emissions from grazing (exclusive) systems: 4–11% of total livestock emissions, and between 0.6 and 1.6% of total annual greenhouse gas emissions – to which of course livestock also substantially contribute." "[184]
- From William H. Schlesinger, one of the most respected soil scientists in this field, in a 2022 study: "Thus, carbon sequestration in agricultural soils, even with best management practices, is not likely to offer a net storage of carbon that can be marketed as a credit to emissions from other sectors of the economy."[185]
- Reinhart et al. (2021) discuss the problems with managing livestock grazing to increase the storage of carbon in soils, citing problems with experimental design in nearly all studies to date.[186]

What the regenerative agriculture movement has done is set up the foundation for delaying changes away from animal-sourced foods, but also greenwashing other highly polluting industries by positioning themselves as carbon offset avenues.

LEARN MORE:

- Branch Out's executive summary of scientific evidence against the Savory Method can be accessed here, with a completed review to be published with the series' conclusion.
- PlantBasedData.org library of peer-reviewed scientific studies related to grazing, including major subfolders on holistic grazing and Allan Savory.

Overlooking Science: Kiss The Ground & Common Ground

While Allan Savory is uncompromisingly pro-grazing with extreme outlier comments that it can reverse desertification and climate change, other groups like Kiss the Ground, and their forthcoming sequel Common Ground, employ half-truths for a call back to traditional forms of American agriculture that include a montage of celebrities. This is a call for balance and reason, while - perhaps unknowingly - supporting the alignment of regenerative agriculture with large industrial agriculture.

In the Common Ground Film Poster, Rancher Gabe Brown is on so-called regenerative farmland next to what appears to be degraded soil, that could easily be for feed crops, not for crops for human consumption.

The many issues with Kiss the Ground have yet to be resolved, and this subsequent film amplifies them. One of the most important issues with the film is that it creates a false dichotomy in that it carefully positions holistic grazing as the answer to intensive animal agriculture (including the mono-cropping that occurs to feed factory-farmed animals) without considering other, better alternatives. There is wide consumer agreement that factory farming is a blight on humanity, and there is far too much mono-cropping, but assuming that it's either this intensive form of animal agriculture or holistic grazing, is not accurate. For a great deal of land, there are other, more evidence-based ways to sequester carbon. Unfortunately, these clearly superior solutions, like regenerative stock-free organic farming, are often missed because they are not tying livestock - and more specifically the consumption of beef - to the solution.

A common tactic employed by Gabe Brown, their featured rancher, is to claim that carbon is sequestered from grazing by not disclosing or discounting that feed crops came from off farm or another entire area of the owned land. This simply moves carbon from one area to another. Gabe Brown claimed to have increased soil organic matter from 6.1% to 11.1% in just 3 years but didn't properly share that this was the result of taking vegetation from elsewhere. It's not just that he imports biomass and nutrients, but at hay bale application rates that would increase soil organic matter this fast, it is a concentration process taking carbon/biomass/nutrients from a larger area and applying them to a smaller area. A win for the smaller area, loss for the larger. Ultimately, as soil scientist Rattan Lal makes clear, agricultural land stores 25-75% less soil organic carbon than rewilded untouched native ecosystems. A shift away from animal agriculture is our best chance to achieve this.[187]

The common slogan: "It's not the cow, it's the how" is like saying how we drive matters more than not driving and encouraging active and public transportation. The 'how' in this context would result in a switch to at least grass-fed beef in the US which would use 63-270% more land & increase their CH_4 by approximately 43%.[188] Instead, what we farm, like replacing beef with nitrogen-fixing beans in the US, could free up 42% of the US land for carbon drawdown and biodiversity.[189]

Offset Impacts

Recently, mainstream media headlines have been awash with corporate news and initiatives highlighting 'carbon neutrality', offsetting impacts, or becoming net zero. We argue that these are largely smoke-and-mirror tactics.

The unfortunate reality of the largely unregulated and potentially fraudulent carbon offset market is that it's often used by the largest emitters for greenwashing purposes.[190] This section will explore how such claims can be viewed as a contemporary manifestation of climate denialism, though veiled under the guise of environmental responsibility.

By shifting from animal to plant-based protein sources for human diets, we could see a reduction in agricultural land use by 83% and a corresponding decrease in resource inputs like water.[191] This represents one of the biggest opportunities to address our environmental crisis.

Gradual shifts towards plant-based eating could halt further deforestation and land changes caused by animal agriculture, such as the ongoing devastation of the Amazon rainforest. This transition could also make large-scale rewilding feasible, allowing native ecosystems to flourish anew.

The restoration of these ecosystems would be highly beneficial to biodiversity and maximize land and soil carbon capture, exceeding the effects of any human intervention.[192] Concurrently, this would result in a significant decrease in global methane emissions. Crucially, studies have shown that switching to plant-centric diets is key to limiting global warming to below 1.5 degrees Celsius by 2030, a goal that cannot be reached by reducing fossil fuel usage alone.[193,194]

Science Based Targets initiative (SBTi)

An independent regulator to assess corporate emissions is key to holding companies accountable, who currently largely self-report emissions. SBTi originally positioned themselves as a tool to counter corporate greenwashing and did excellent work requiring Scope 3 third-party supply chain emissions to be "required if a company's scope 3 emissions are 40% or more of total scope 1, 2 and 3 emissions across all categories...".[195]

Scope 3 emissions represent up to 97% of JBS's climate footprint, and over 90% of most major meat and dairy companies.[196]

However, a new approach has arisen from SBTi called FLAG (Forest, Land, and Agriculture) and Cargill now claims they are SBTi approved.

FLAG involves new categories of emissions accounting, like land use change, land management, and emission sinks, and outlines the process for companies to set science-based targets for FLAG-related emissions. This is important as land is often omitted from greenhouse gas accounting. Unfortunately, if done poorly, it can also avoid absolute emissions reductions and open up significant carbon offset greenwashing.

Cargill, Tyson, McDonald's and others are now advocates and supporters of SBTi, via FLAG. They were consulted as it was being created. SBTi's FLAG targets include "biogenic carbon removals," meaning that they will allow forest preservation efforts, and could also soon include agriculture specific carbon drawdown claims by companies to count as "negative emissions" against their targets:

Timestamp Youtube presentation

What this means is the major animal agriculture companies can maintain the high number of animals they farm, incorporate offsetting with little long term accountability,[197] and show consumers they are doing their part to solve climate change with very little absolute emission reductions.[198]

FLAG targets also allow producers to set emissions intensity targets rather than absolute targets which plays in perfectly to animal agriculture's 'efficiency' claims that more meat and dairy is produced per animal, essentially rewarding intensification.

Image sourced from Desmog: https://www.desmog.com/2021/07/18/investigation-meat-industry-greenwash-climatewash/

JBS Offset Scam

JBS, the largest animal protein producer in the world, claims they'll be net zero by 2040, yet their pledge omits about 90% of their emissions, including those from deforestation.[199]

Following a report and official complaint filed by IATP, Desmog, and Feedback, JBS USA Holdings, Inc. was urged to discontinue certain claims relating to its goal of achieving "net zero" emissions by 2040 by the National Advertising Review Board. After the complaint, JBS admitted they're actually still in the exploratory stage of their net zero efforts.

JBS's claims that will now need to be retracted include:

- "JBS is committing to be net zero by 2040";
- "Global Commitment to Achieve Net-Zero Greenhouse Emissions by 2040";
- "Bacon, chicken wings and steak with net zero emissions. It's possible";
- "Leading change across the food industry and achieving our goal of net zero by 2040 will be a challenge. Anything less is not an option"; and
- "The SBTi recognized the net zero commitment of JBS."

Sourced from: JBS

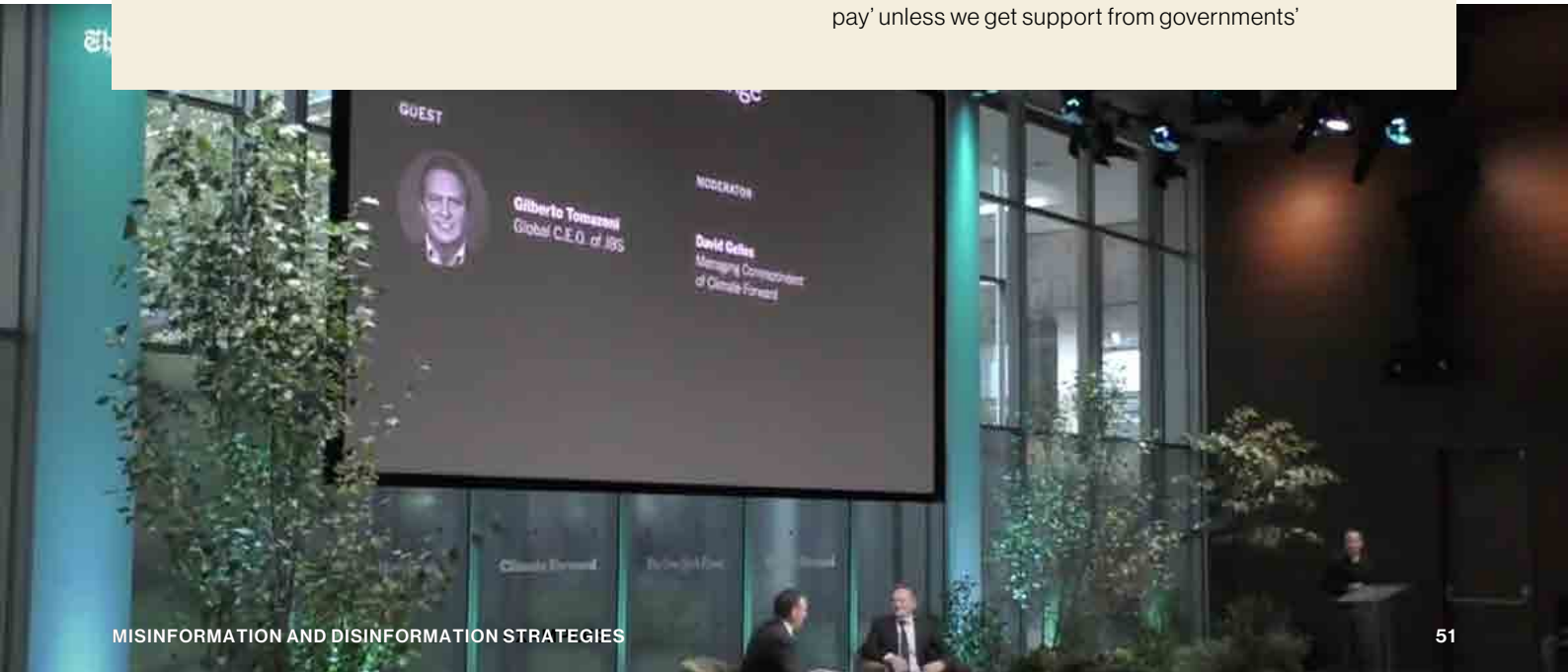
The C.E.O. of the World's Largest Beef Producer Answers Questions About Its Environmental Record

JBS CEO Gilberto Tomazoni interviewed by New York Times' David Gelles

The CEO of JBS, world's biggest meat packer answered questions from a NYT journalist in preparation for a controversial New York Stock Exchange (NYSE) listing:

Tactics as paraphrased from this interview:

- 'We believe farmers are part of the climate solution'
- '1/3 of the population don't have enough food'
- 'Deforestation is a big issue and no one can solve it alone'
- 'We want more government regulated traceability if we don't want deforestation'
- 'We volunteer release all information we have, but don't have scope 3, but when we do we'll release it'
- 'We pledge to be net zero by 2040 not 2050 because we recognize the urgency of that' despite it being deemed as misleading by the National Advertising Review Board
- Journalist: how is that even possible?
  CEO JBS: 'Scope 1 and 2 is no problem, 48% of our energy is already renewables'
- Journalist: But where does the net sink come from even if it's all renewable that won't change the majority of impacts from animal agriculture?
  CEO:
  - JBS: 'We will bring the farm back to life and bring biodiversity'
  - 'We just need more support for the farmers to be more productive and sustainable'
- 'Not disclosing number of animals slaughtered is not an issue of sustainability, it's about strategic information'
- 'The main strategy we have is regenerative agriculture'
- 'We also produce supplements to reduce methane and have great results, more than 70% reduction in methane'
- 'Supplements cost money and consumers will pay' unless we get support from governments'



Seaweed Offset: Another Greenwashing Scheme?

Synergraze, a startup that promises to reduce cattle methane emissions by feeding them a type of red seaweed, managed to get support from Emissions Reduction Alberta in the form of $5 million in research and technology funds from a GHG reduction fund despite not having proof of the viability of this method. Synergraze is used as an offset tool, and is funded through Canada's oil pipeline as a carbon offset.

> *"Trans Mountain has invested in Synergraze Inc., a start-up company aimed at commercially growing and processing a natural cattle feed additive based on a strain of red seaweed that can reduce enteric methane emissions in cattle and other ruminants by up to 90 per cent. Synergraze has secured a $5 million grant from Emissions Reduction Alberta and a commercial license to use the additive in Alberta, British Columbia, and Ontario. The methane emission reductions can be independently verified using appropriate quantification protocols to generate offset credits. With Trans Mountain's support, Synergraze is developing a land-based pilot on Vancouver Island and is working with T'Sou-ke First Nation to set up a commercial aquaculture facility to farm the red seaweed in T'Sou-ke First Nation territory. Trans Mountain's agreement provides us access to validated and verified emission offset credits as they are generated by Synergraze."*[200] *Reducing cattle emissions up to 90 per cent through a feed additive*

Assuming this even comes to fruition, they'd need to import red seaweeds from elsewhere as they're not native to the colder British Columbia coast where brown seaweed grows, and which don't have the same anti-methanogenic[201] effect (like Asparagopsis).[202] Another important note is that the bromoform created as a byproduct of the attempt to reduce methane is ozone depleting and may have negative effects, depending on volume.

Despite media headlines that imported red seaweed fed to cattle will be a game changer for beef's climate footprint, in reality it would really only reduce it about 8% of their own cattle's emissions, without being able to offset anything else, since this is only applicable during the feedlot stage of a cow's life.[203] What is important to state as emission reductions is the total lifecycle reduction in emissions.

Growing native seaweed can be a good carbon drawdown solution if grown for restoration with the caveat that a major portion of it needs to be allowed to sink to the ocean floor for long term storage.

Can Offsets Work?

Some simple recommendations based on an analysis of hundreds of offset claims and studies on the topic include the following:

- The best offset is no offset at all. First, reduce greenhouse gas emissions and other ecological impacts. This is especially key for the big energy and agriculture sectors.
- If you can't reduce emissions - because perhaps there's actually no readily available alternative - offsets can help temporarily.
- Regulated, satellite-tracked, and Indigenous-consulted nature rewilding offsets are best. Shifting to a plant-based food system would free up at least 3 billion hectares of land, where current land users can be incentivized to support transitions.
- Carbon capture technologies and so-called regenerative grazing are the most problematic offset programs.[204]

Social Media Manipulation

The media plays a critical role in shaping public understanding of various issues, including those related to animal agriculture. Yet, increasingly, media can inadvertently contribute to misinformation and disinformation around the topic, partly due to a changing media landscape including major consolidation.

Throughout history, the media has largely overlooked animal agriculture and its environmental issues. An analysis of the Los Angeles Times' reporting between 1999 and 2010 revealed that just 5% of the 380 articles discussing livestock made any mention of its link to climate change.[205] Similarly few mentions were present in the New York Times with meat specifically mentioned.

A recent survey of 7,500 individuals in the United States, the United Kingdom, Germany, France, and Brazil inquired about the industries and environmental concerns they believed had the most significant impact on the climate crisis. In general, respondents tended to underestimate the role of industrial meat production, despite it being one of the major contributors to climate change and the largest driver of deforestation and land use change.

Another analysis showed that 93% of climate news never mentions meat. A data analysis of climate-related media coverage released on May 31 2023 examined the 100 most recent climate articles from 10 national US publications, such as the New York Times and the Wall Street Journal, as of September 2022. Out of a total of 1,000 articles, only 7 percent addressed animal agriculture. Within this subset of coverage, much of the reporting is focused on the effects of climate on livestock rather than emphasizing how meat production contributes to greenhouse gas emissions.

How misinformation and disinformation is spread through news media:

- **Oversimplification of complex issues:** Many aspects of animal agriculture are complex, involving intricate interactions between environmental, economic, social, and ethical factors. However, the media often reduces these complexities to simplified narratives or soundbites, leading to a distorted understanding of the issue. For example, the media may present a binary debate between beef burgers vs. plant-based burgers, without addressing the nuances of slaughterhouse working conditions, food security, land use, or Indigenous and Black community considerations.

- **Influence of industry advertising and sponsorships:** Media outlets often rely on advertising revenue, and some are sponsored by agribusiness corporations. This can lead to conflicts of interest and contribute to a positive bias towards animal agriculture, even in the face of negative environmental and health impacts. An example of paid media content is this Washington Post promotional piece for JBS. They are the world's largest meat producer that accounts for the highest emissions of any company in agriculture and methane emissions exceeding the combined methane emissions of France, Germany, Canada, and New Zealand.

- **Spread of industry-produced content:** Content produced directly by industry groups, like promotional videos or press releases, which may be uncritically disseminated by media outlets, spreading potentially biased information.

- **Absence of critical perspectives:** Media coverage often lacks input from environmental scientists or public health experts who are able to provide critical perspectives on the impacts of animal agriculture. Instead, the media often amplifies the voices of industry representatives or individuals who support the status quo.

- **Sensationalism and fear-mongering:** Some media outlets may exaggerate or distort the potential impacts of shifting away from animal agriculture, causing undue fear or resistance to change. For example, they might highlight potential job losses in the sector without exploring the opportunities for job creation in alternative, more sustainable food systems. In a recent Canadian analysis, of transitions away from animal-sourced foods, the economic situation would improve, including jobs.

- **Bothsidesism:** Media often presents 'both sides' of a topic, even when one side is backed by close to, or full, scientific consensus. This falsely portrays the issue as an open debate. Northwestern University researchers recently called this "bothsidesism."[206] This frequently plays out when a new study is released outlining the environmental impacts of animal agriculture, and the media will invite a lobby group like the Canadian Cattlemen's Association to provide one side, like what was done here by CBC. See the below collection of 2,277 fake news related papers, randomly chosen and categorized.

By reinforcing industry narratives, oversimplifying complex issues, and at times promoting false information, the media can contribute to a skewed public perception of animal agriculture's impacts. It underscores the need for media literacy and critical thinking when consuming news related to these topics.

Misinformation is now being incentivized. Fake news is no longer merely propaganda spread by inflammatory politicians; it is also made for financial benefit or personal enjoyment.

A collection of 2,277 fake news related-papers, randomly chosen and categorized.

Each marker indicates the number of fake news studies per type published in a given year. Fig 4(a) shows a research trend of news creation and consumption (main category). Fig 4(b) and 4(c) show a trend of the sub-categories of news creation and consumption. In Fig 4(b), "Miscellaneous" includes studies on stance/propaganda detection and a survey paper. In Fig 4(c), "Data-driven fake news trend analysis" mainly covers the studies reporting the influence of fake news that spread around specific political/social events. "Conspiracy theory" refers to an unverified rumor that was passed on to the public.[207]

Fake news research trends of the past decade (2010–2020)

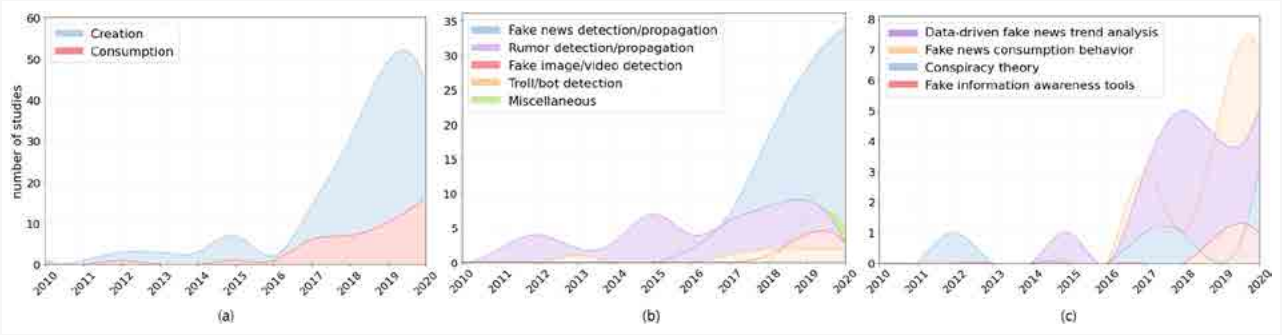


Image sourced from: https://doi.org/10.1371/journal.pone.0260080.g004

Disinformation campaigns from animal agriculture are contributing to the confusion, leading the American public to believe things that are easily disproved:

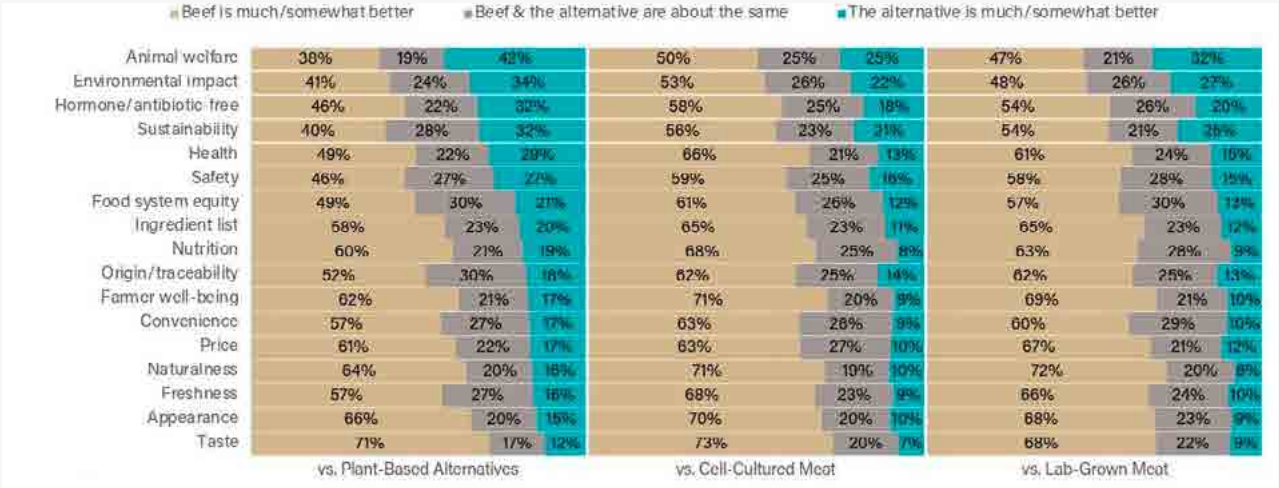


Image Source: https://jaysonlusk.com/blog/2023/8/9/beliefs-about-beef-vs-plant-based-cell-cultured-and-lab-grown-alternativesbeef-vs-plant-based-cell-cultured-and-lab-grown-alternatives

In this recent poll conducted by economist Jayson Lusk, respondents believed that beef is almost better than plant proteins for animal welfare, and better for the environment: Beliefs about beef vs. plant-based, cell-cultured, and lab grown alternatives

Over 285 million social media posts related to meat and dairy misinformation were reviewed, revealing five main attacks:

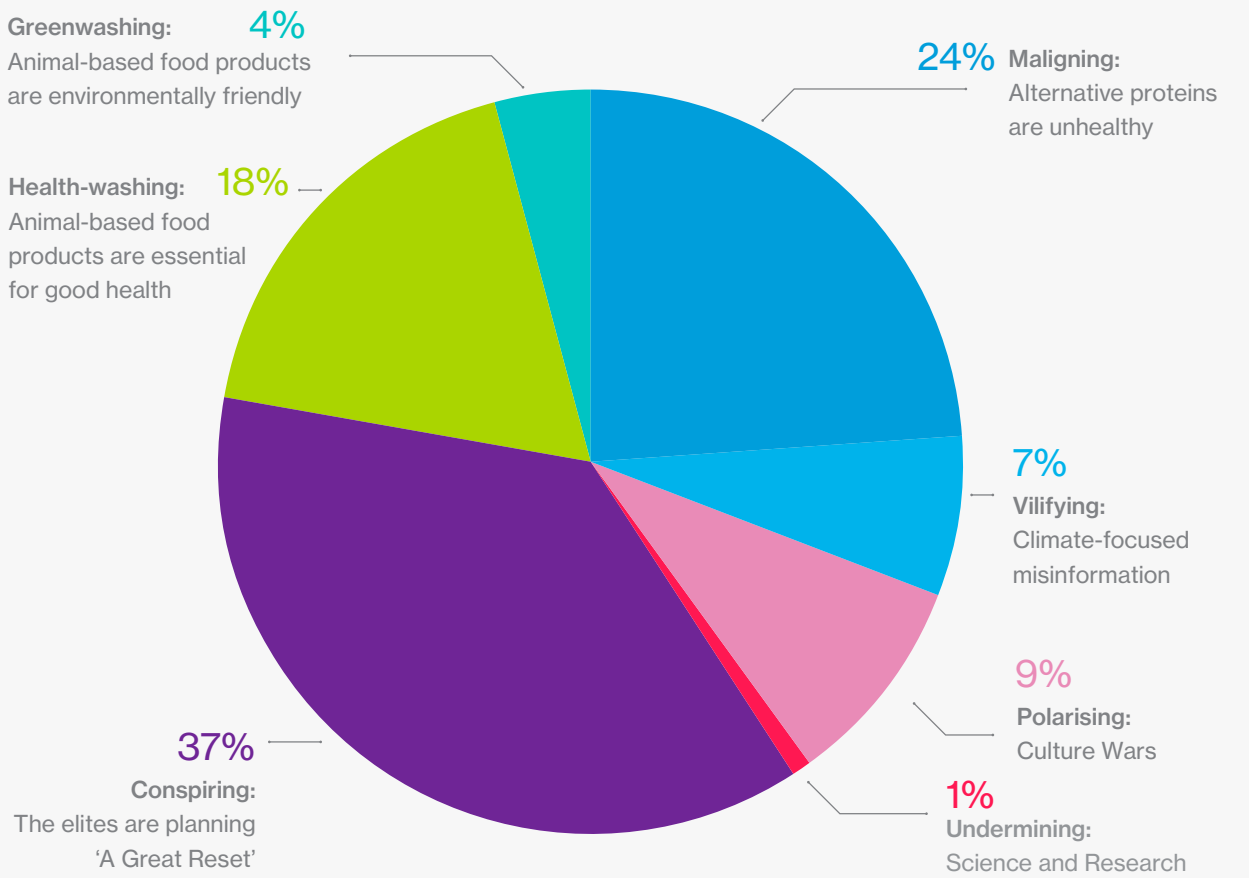
Saying alternative protein products are unhealthy

Criticizing alternatives for their environmental impact

Leveraging cultural wars for political gain

Undermining scientific research on the impacts of animal agriculture

Framing diet shifts as an 'elite' agenda playing into conspiracy theories.



Examining the narratives and discourse of the full data community is key to gaining a fuller understanding of the conversations relating to meat and dairy misinformation. From Changing Markets Report: Truth, lies and culture wars: Social listening analysis of meat and dairy persuasion narratives.[208]

Lastly, a media strategy now relies on social media influencers. In an analysis reviewing wellness influencers, dissemination of misinformation regarding climate change is prevalent. This misinformation encompasses denial of climate change's existence or human impact, coupled with a minimization of its impacts. These influencers assert that meat consumption is inherently healthy, natural, and ecologically sustainable while concurrently discrediting vegan and vegetarian dietary practices.[209] Narratives that meat eating is "healthy", "natural" or "sustainable" are often spread by 'carnivore influencers' such as 'CarnivoreAurelius', 722k instagram followers. Exploiting language specific to their community, these influencers intertwine climate change discourse with broader conspiracy theories and health apprehensions, leveraging their audience's concerns about bodily autonomy, vaccination, and wellness. The visually engaging content they produce has the potential to shape their audience's perceptions of climate change and environmental matters. This raises concerns regarding the susceptibility of individuals to adopt alternative, unfounded explanations, thereby undermining evidence-based data and solutions. The limitations of automated content moderation strategies in combating this misinformation necessitate enhanced transparency and action from social media platforms. Addressing these issues demands a priority focus on accurate education and the discrediting of misinformation propagated by influential figures who endorse animal agriculture as a sustainable and healthy practice.[210,211]

Industry funded bots and influencers attempt to create 'bothsidesism' and a feeling of a balanced debate when an abundance of science clearly states a direction we need to move in: more plants, less animal-sourced foods. This clouds out quality independent meta-analyses and maintains business-as-usual. Major media and social media companies need far better ethics and standards for those clearly pushing misinformation for political or business gain and negatively influencing planetary and public health. And we must improve critical analysis education to help everyone better decipher what's accurate when industry-funded information often gets the most views.

ACTION STEPS

- Governments should foster news literacy and robust professional journalism within their societies.
- The news industry should prioritize high-quality journalism to establish public trust and address fake news and disinformation.
- Technology media companies should develop tools to identify fake news, reduce financial incentives for disinformation profiteers, and enhance online accountability.
- Educational media institutions should prioritize media literacy training. Individuals should diversify their news sources and approach information with scepticism.

Although a future of reliable and credible information is possible, substantial efforts remain essential.

LEARN MORE:

- Research How to combat fake news and disinformation

AI Influence

Over the past few years, artificial intelligent (AI) powered social media and chat bots have amplified misinformation.[212] Through operationalizing AI in social media, one can do more than simply spread factually incorrect narratives; one can also create an illusion of online support that can foster real support. These bots, powered by sophisticated algorithms and machine learning, have become adept at amplifying false narratives and shaping public opinion.

AI bots can operate on a massive scale, creating and disseminating content at a speed and volume that humans can hardly match. They exploit social media algorithms to increase their visibility, often leading to viral spread of misinformation. These bots can mimic human behavior, making it difficult for users to discern between genuine content and fabricated information. As they engage with real users, they create an illusion of legitimacy, further amplifying the reach of misinformation.[213]

Researchers have observed how AI bots have become more sophisticated over time.[214] They can now simulate genuine emotions, responses, and even personalized interactions with users.[215] Advanced natural language processing allows them to craft persuasive messages and adjust their strategies based on real-time data and trends. This adaptability makes them highly effective in evading detection and countermeasures implemented by social media platforms.

The combination of scale, speed, and human-like behavior makes AI bots a powerful tool for disseminating disinformation on social media, but also promoting it, leading to polarized opinions, undermining trust in reliable sources, and influencing public discourse. As the technology continues to evolve, it poses significant challenges for identifying and mitigating its impact, requiring constant research and vigilance to create integrity within social media spaces.

Social Bots:

Automated accounts driven by social bots are primarily influential during the initial phase of spreading fake news. The distinction between these accounts being human-operated or bot-driven is often difficult for the public to discern. It's worth noting that social bots are not inherently illegal tools; many companies legally employ them as part of marketing efforts, making it difficult to systematically curtail their use (Shao et al., 2018).[216]

Trolls:

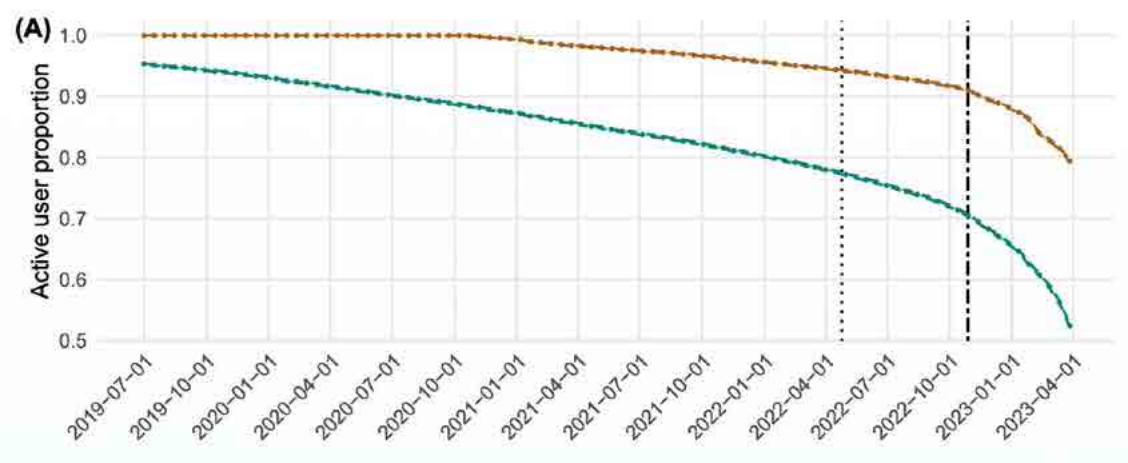
The term "trolls" refers to individuals who intentionally create conflict or division by posting inflammatory, provocative content or unrelated materials within online communities. Their aim is to evoke emotional responses and disrupt constructive discussions (Systematic review of fake news).[217]

Fake Media:

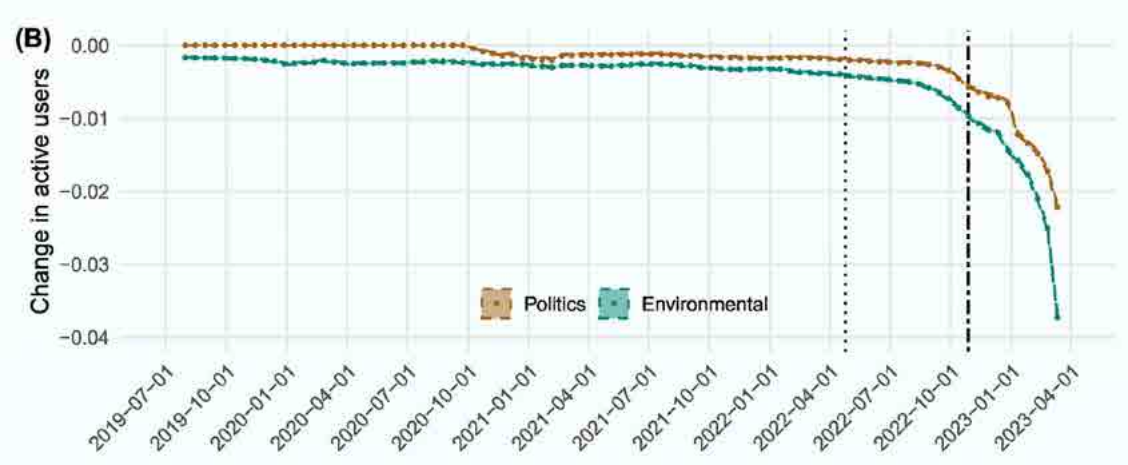
Technological advancements, particularly AI, have enabled the manipulation and replication of content in both 2D and 3D formats. The emergence of fake news utilizing Deepfake technology, which involves merging various images into an original video to generate a different video, has introduced a significant societal concern. This technology's ability to fabricate content has gained traction, especially given the prevalent sharing of images and videos on social media platforms. The increasing sophistication of Deepfake technology has expanded its application across various domains involving images and videos.

As of 2017, it was estimated that 48 million Twitter accounts were not real people, but instead bots controlled by people or parties who wanted to sway public opinion. Since billionaire entrepreneur Elon Musk acquired Twitter, bots and misinformation has only increased, partly due to Musk's significant resource drain in the form of staff cuts and removal of key content moderation roles from the company.

Tracking changes among Environmental and Politics Twitter users



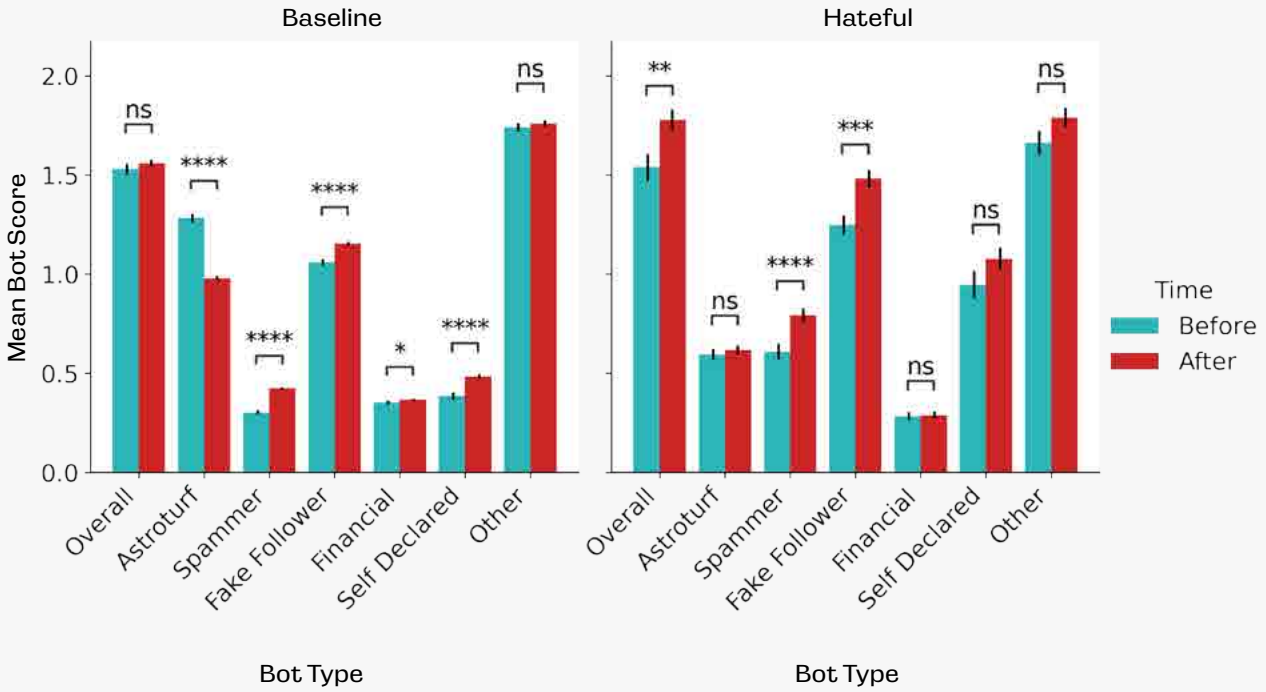
(A) The proportion of users that were active in each 15-day window.



(B) The rate of change in the proportion of active users for both samples. In both plots, the points depict the observed data while the color band with a broken line shows the 99% confidence interval based on a bootstrap sample of the data. The broken vertical line corresponds to 25 April 2023, when the Twitter board accepted Musk's initial purchase offer, and the heavier broken line corresponds to 28 October 2022, when Musk's takeover was finalized.

Image sourced from Chang et al. (2023): Tracking changes among Environmental and Politics Twitter users.

Mean Botometer scores before and after Musk's purchase

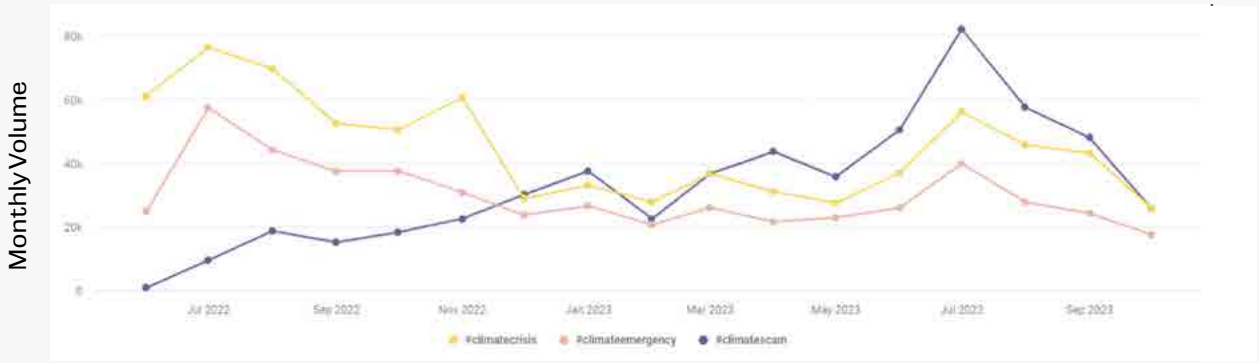


Black lines represent standard errors. P-values are calculated from the two-sided Mann-Whitney U test.
*:p < 0:05, **:p < 0:01, ***:p < 0:001, ****:p < 0:0001

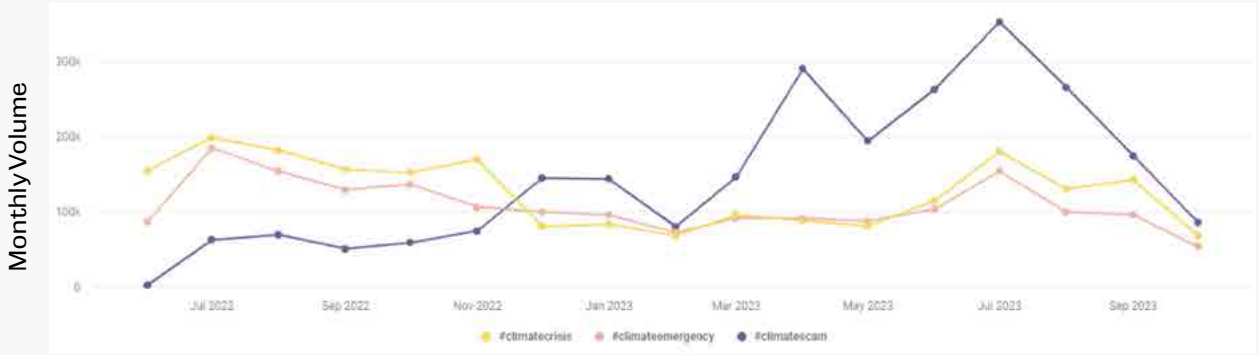
Image sourced from: https://arxiv.org/pdf/2304.04129.pdf - Auditing Elon Musk's Impact on Hate Speech and Bots

Studies point to an exodus of climate voices on Twitter (now X) in recent years, and more recently half of all regular posts about the environment have been removed since the platform's sale to Musk.[218] In a recent analysis of 380,000 environmentally-oriented users, nearly 50% became inactive after it was sold in October 2022, a rate much higher than a control sample.[219] Given Twitter's importance as an online public square for communication, these findings have troubling implications for digital environmental information sharing and public mobilization. This makes it that much easier for campaigns like #YestoMeat to succeed.

Since December 2022, #ClimateScam has outperformed both #ClimateCrisis and #ClimateEmergency every month on X, regardless of whether you measure by retweets or likes.[220]



Monthly volume of **original tweets and replies** between 1 June 2022 and 31 October 2023 containing #Climate Scam [purple], #ClimateCrisis [yellow] and #ClimateEmergency [pink] respectively. Some posts cited more than one hashtag; in such instances, these were counted once in each category.[221]



Monthly volume of **retweets for original tweets and replies** between 1 June 2022 and 31 October 2023 containing #Climate Scam [purple], #ClimateCrisis [yellow] and #ClimateEmergency [pink] respectively. Some posts cited more than one hashtag; in such instances, these were counted once in each category.[222]

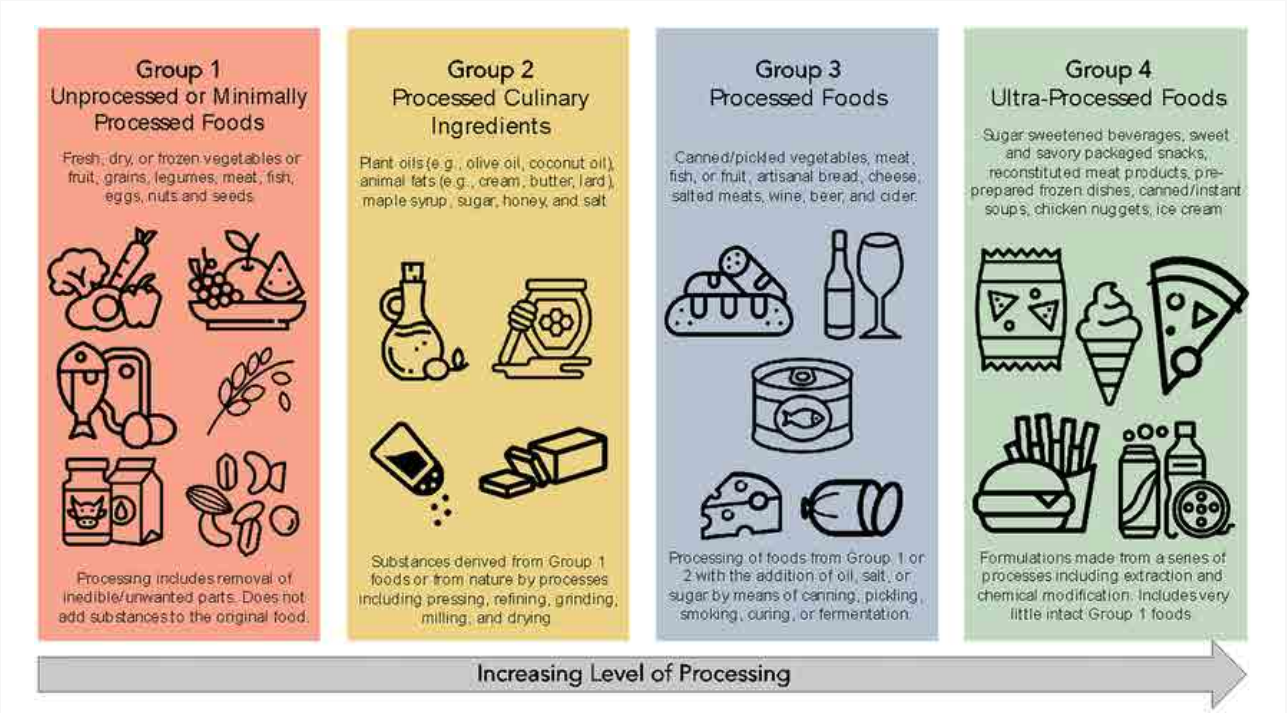
Where this is also playing out the most is through astroturf campaigns. Astroturfing is an organized activity that is intended to create a false impression of a widespread, spontaneously arising, grassroots movement that is in support of or in opposition to something but that is in reality initiated and controlled by a concealed group or organization (such as a corporation).

LEARN MORE:

- Understanding the dark side of social media

NOVA Ultra-Processed Classification

The NOVA classification of food



While individuals derive numerous advantages from modern food processing techniques, certain healthcare experts and online influencers propose that limited advantages and potential health risks arise from inadequate nutrition resulting from the consumption of processed foods (PF).

A novel categorization, named NOVA and partly developed by a Brazilian scientist Carlos Monteiro, has been introduced to classify foods into four groups based on their processing extent. Unlike some other examples in this report, NOVA has highly credible origins and has been a valuable addition to the scientific literature but has been unintentionally misused to fuel misinformation. Some animal agriculture industry health proponents are inflating its value as the main focus rather than if foods are animal or plant sourced.

NOVA is good for highlighting some foods we know to be fundamentally unhealthy, but healthy foods can be low grade and some unhealthy foods can be high grade. By categorizing the items in that way, NOVA classifications can be used to implicitly and explicitly recommend people eat more beef, and less tofu, more cow's milk, and less oat milk. Fortified soy milk may be categorized under the harmful categories of 3 or 4, the best plant-based meats (perhaps ones with less sodium and more whole ingredients) get included with the worst ones with no distinction, and all are included with clearly health damaging high-sugar and fat doughnuts or other desserts.

A common technique of misinformation in the health and nutrition sphere is to group different food types together in a manner that either makes an unhealthy food look healthy, or an unhealthy food seem healthy. As such, the NOVA classification system, which sorts foods by level of processing has important merits but is increasingly misused by promoters of animal product consumption.[223] The categorization conflates healthy foods and unhealthy foods through mass group categories, and inflates the perception of health benefits of certain animal products (i.e. red meats, meats in general, eggs, dairy milk, butter and lard), and denigrates the health perception of key plant products that compete with animal products such as protein foods or healthy alternatives (i.e. whole grain products, plant-based meats, soy milk).[224] Also, the actual processing in some Group 1 animal products is obscured, while overemphasis is placed on key plant foods, which are then denigrated in comparison.

Ultra Processed Foods (UPFs) mainly include junk foods, and other meal foods that have been stripped of nutritive components, while being high in refined carbohydrates, sugars, fats and sodium. Potato chips, chicken nuggets, candies and

sugar sweetened beverages fall into these categories. Most of these have a negative health impact compared to less processed foods, and are a major nutritional issue.[225] This may change as the category of plant-based products grows, and the utmost care to health needs to be taken seriously.

The NOVA classification groups thousands of foods into broad categories. Research shows that generally eating from group 1 (considered whole foods) is more healthful than eating from group 4 (considered UPFs). Group 2 is composed of cooking ingredients salt, sugar, and fats, including items like extra virgin olive oil as well as actual lard. Group 3 are "processed foods" and seem to have a negative connotation. Group 3 may include anything from whole grain bread, cheese, wine and beer, smoked meats, and possibly fortified soy milk, though some may place fortified soy milk in group 4 as well.

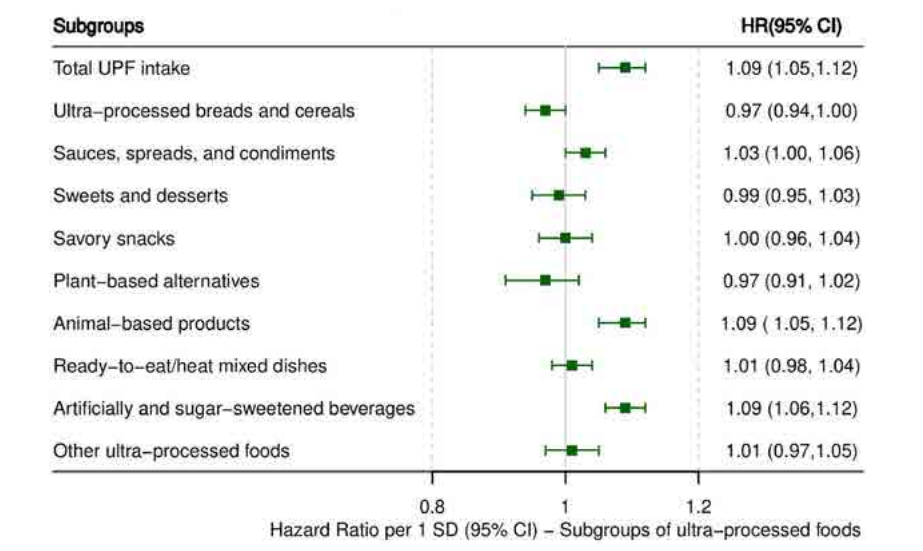
This can all be used as a tactic of doubt and confusion where NOVA becomes the dominant lens through which to perceive foods, minimizing the greater importance of research on individual foods on a case by case basis, which is more accurate than generalizations. Furthermore, despite the general utility of NOVA, there are absurd groupings if NOVA is used to judge specific foods. Fortified soy milk would be group three or four, while beer and wine are also classed in group three, despite strong evidence linked to cancer and other diseases.[226] The alcohol industry may well benefit from the inflated health perception of their products as per NOVA. Plant-based meats are classified as group four, along with Twinkies and Coca Cola. Lard and butter are equated with olive oil, despite data on cholesterol and saturated fat. Whole grain products are lumped into group three and not distinguished regarding their important health differences, and also categorized with smoked and cured meats and alcohol.

Furthermore, interposing salt, sugar, and fats by placing them in group two, thus ahead of group three and four, further lowers the perception of the latter groups, despite these ingredients not being full foods on their own, and their excess usage often being the key problem in many UPFs.

A possible end result is the heavy promotion of a narrative that red meat, organ meats and other meats are promoted as healthy despite more specific evidence[227] regarding mortality,[228] heart disease,[229] and cancer,[230]; smoked and cured meats have a moderate status despite strong evidence of their detriment; and all plant-based meats must be unhealthy. Eggs and dairy milk are promoted as healthy. Fortified plant milks are presented as less healthy or unhealthy in comparison. The NOVA narrative is replacing the superior data we have regarding the pros and cons of individual foods.

This study looked at sub-groups of UPFs and their associations with developing cancer and cardiometabolic diseases.[231] The increased risk from 'total UPF intake' was driven mostly by animal-based products and sweetened beverages:

Forest plot of Hazard Ratios



Illustrates the link between various ultra-processed food subgroups and the risk of cancer and cardiometabolic multimorbidity. The analysis adjusted for multiple factors using Cox proportional hazard models and found associations based on energy-adjusted subgroups of ultra-processed foods consumed daily.

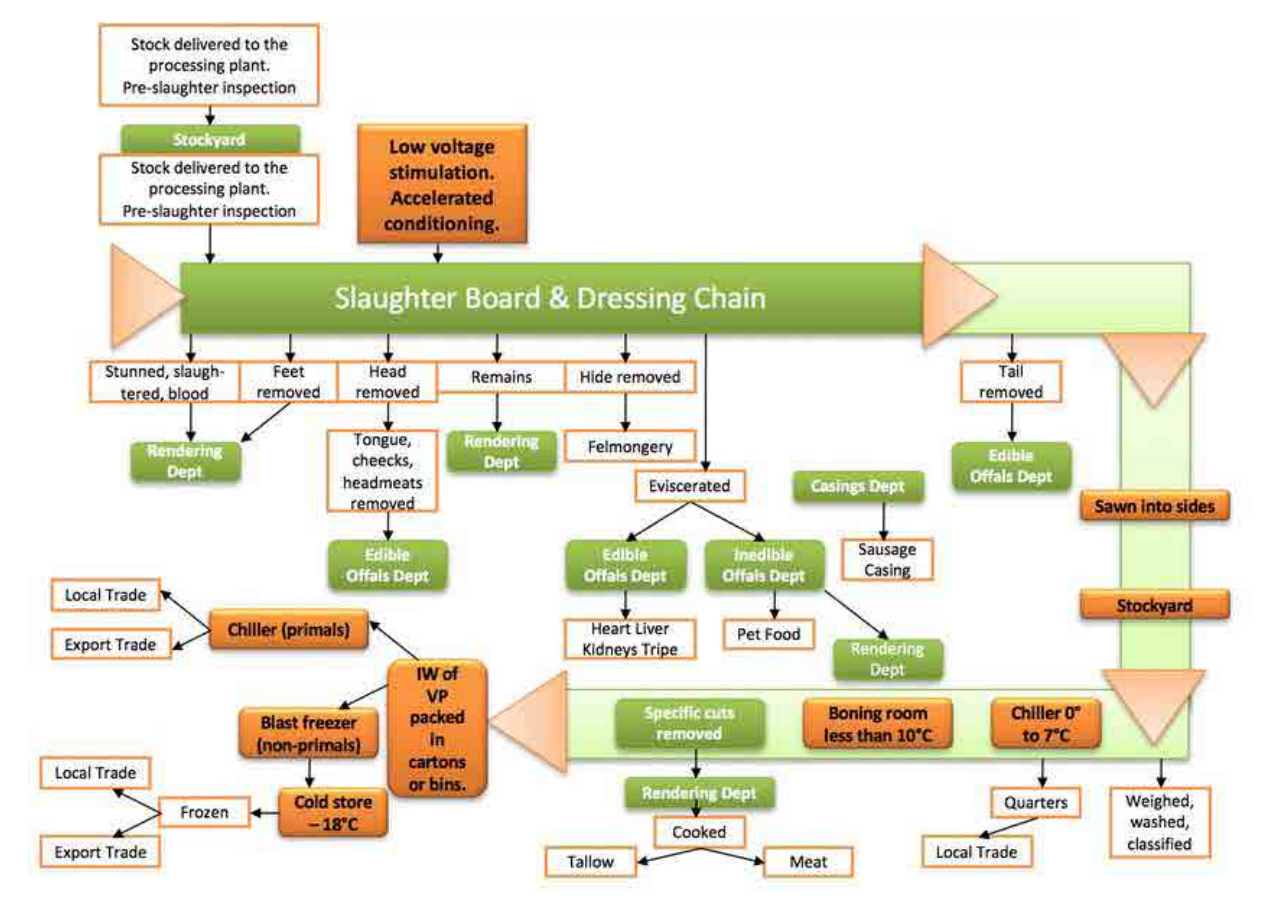
Sourced from Cordova et al., (2023)

All of this is not to say that all plant-based meats or milks are equally healthy. Again, these must be evaluated on a case by case basis. Fortified soy milk with low sugar content is likely an excellent option, containing most of the soybean nutrition. Meanwhile, other plant milks are usually protein deficient. Plant milks based on protein isolate, such as pea protein milk may have eliminated most of the whole food and gut-health aspect of peas.[232] Regarding plant-based meats, some have very high sodium and saturated fats from tropical oils, others eliminate tropical oils and have much lower sodium levels, may contain high proportions of organic ingredients, and have excellent fortification profiles.

Lastly, many of the meat and dairy products that are promoted as "unprocessed" do actually go through significant processing. Processing red meat or any meat starting from the slaughtering of an animal up until the finished meat for sale is an in depth process. Factory farming is also a significant aspect of processed meat, dairy and egg production which are far beyond even conventional plant food production. According to a recent analysis, pigs are often fed a slurry of their own feces and intestines to "prevent disease". Meanwhile, any food that is cooked, seasoned, preserved, or combined with other foods, or is altered from its raw state has technically been processed. A large proportion of animal feed also includes conventional plant production processing. Dairy also requires processes including removal and re-addition of fats, homogenization, pasteurization, and fortification. Part of the process involves centrifugation and filtration to remove pus cells. This processing is not necessarily detrimental, since they improve health and safety, and the lower fat varieties reduce cholesterol and saturated fat. However, the process similarly involved processing of plant milks, again showing the bias against fortified plant milks.

In Group 1, why is beef categorized as 'minimally processed'? The process these foods go through It could be argued that these foods have a basic level of processing, based on the steps needed to ensure no food pathogens:

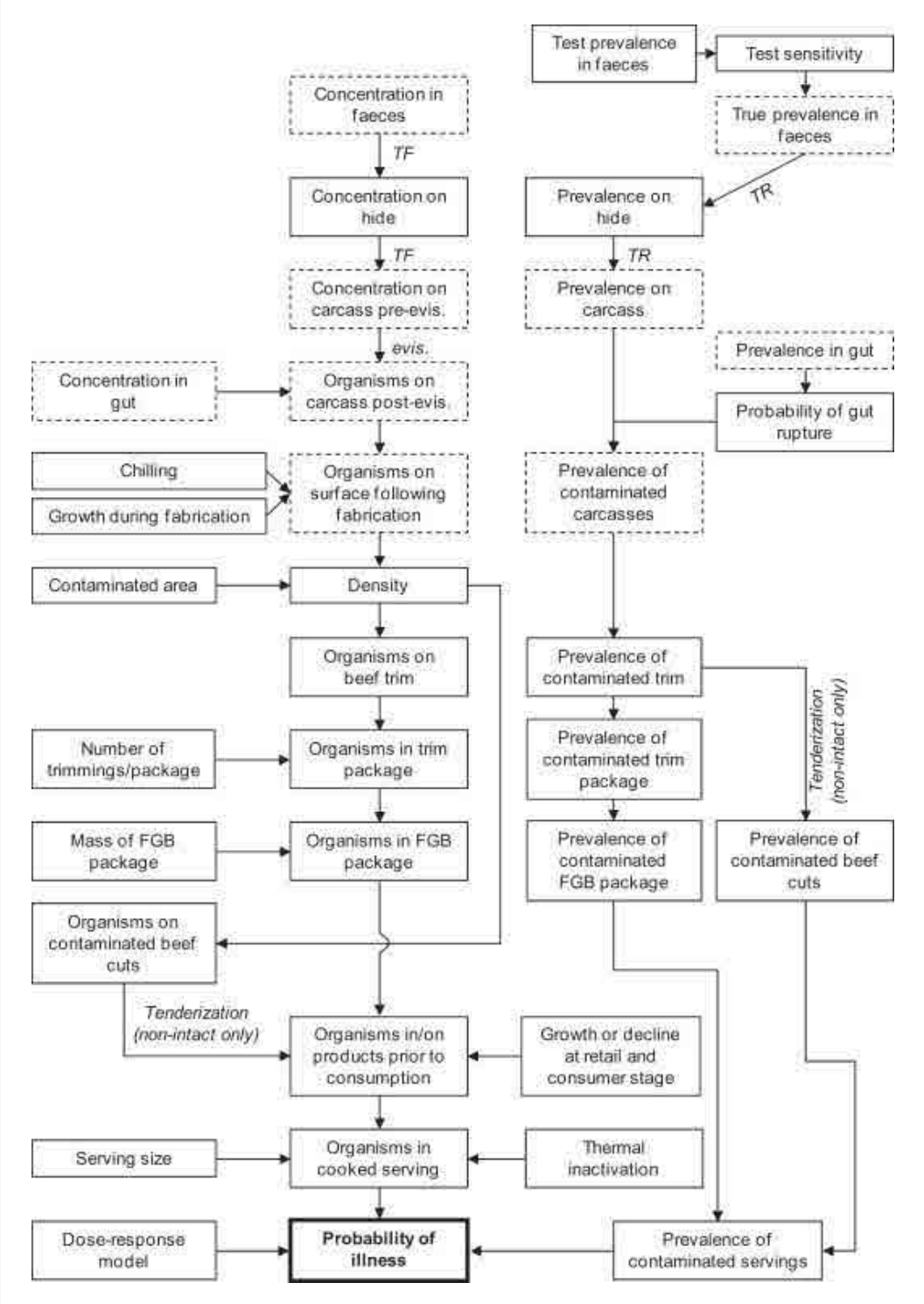
Flow Chart: Beef Processing



Source: https://www.idc.co.za/wp-content/uploads/2018/11/Beef-Study-Final-Report.pdf [233]

As shown below, beef requires a major amount of processing to avoid illness from consumers.[234]

Flow diagram of the risk assessment model for E. coli O157:H7 in ground beef and non-intact and intact beef cuts



Dashed boxes indicate points along the agri-food chain where interventions identified through systematic review and/or meta-analysis are evaluated in the model. Bolded boxes indicate key model outputs.
FGB = ground beef; TF = transfer factor; TR = transfer ratio.

Food Health Impact Industry Tactics

There are many tactics that the animal agriculture supporters use to create and publish studies that cause conflation regarding the health impacts of plant and animal foods. A comprehensive analysis is beyond the scope of this paper, but a few examples are presented:

- Studies which lump refined carbohydrates together with whole grains make "carbohydrate" foods look bad by design, obscuring the benefits of whole grains.
- Cholesterol and saturated fat studies have been published which compare groups with high intake to others with even higher intake, but not to people with extremely low intake.
  - Since there is a ceiling effect on the harms of high cholesterol and saturated fat consumption, results show that the "lower" consuming group has similar health effects compared to the higher group.
  - As such animal agriculture promoters argue that cholesterol and saturated fat consumption is not harmful.
  - However, better studies show that actual lower consumption is beneficial, as are cholesterol lowering medications.

- Studies that conflate groups with vast socioeconomic, geographical differences in entire life circumstances as being comparable, leading to absurd conclusions regarding the health impact of certain foods. Such researchers promote that "statistical adjustment" can account for differences, but this is not the case when comparison populations in studies are so vastly different.

"NOVA is based on the erroneous assumption that all commercially manufactured foods have low nutritional value, promote weight gain and chronic diseases to consumers because they contain sugar, salt and additives. It dismisses the proven benefits of diets chosen with the right mix of foods at all levels of processing."[235] (Petrus et al., 2021)

Comparing highly processed animal foods to highly processed plant-based foods buys into a false and distracting comparison that leads to many pro-plant people making conclusions based on an incomplete list of alternatives. What needs to be compared is animal foods against what is known to be health-promoting, whole or minimally processed plant-based foods.

The science around the effects of processing is still very much in its infancy. Early indications are showing adverse effects of increasing levels of processing, but mechanisms of action are still quite open to discussion, including on the grounds that many effects are thought to be mediated through interaction with gut microbiome and are still only barely beginning to understand the many functions and effects of the microbiome on health.[236] This complexity is why it is paramount that initiatives like NOVA improve communication so as to not unintentionally offer industry a free-pass to co-opt messaging to promote 'unprocessed' meat and dairy which are a known risk factor for a wide range of diseases.

LEARN MORE:

Position paper on the growing interest in a newly-popularised idea in health and nutrition: 'ultra-processed foods' November 2023

Meat and Mortality

Association of Major Dietary Protein Sources With All-Cause and Cause-Specific Mortality: Prospective Cohort Study

Estimating impact of food choices on life expectancy: A modeling study

2020 ** Dietary intake of total, animal, and plant proteins and risk of all cause, cardiovascular, and cancer mortality - systematic review and dose-response meta-analysis of prospective cohort studies - main folder - All Cause Mortality

DAIRY RELATED ARTICLES:

Dementia:

Milk Intake at Midlife and Cognitive Decline over 20 Years. The Atherosclerosis Risk in Communities (ARIC) Study

Mortality

Associations of dairy intake with risk of mortality in women and men: three prospective cohort studies

Dairy and Cancer

Milk Intake in Early Life and Risk of Advanced Prostate Cancer

2015 Dairy products, calcium, and prostate cancer risk - a systematic review and meta-analysis of cohort studies

Dairy intake after prostate cancer diagnosis in relation to disease-specific and total mortality

Dairy, soy, and risk of breast cancer: those confounded milks

Critique of NOVA systems by Seivenpiper and Messina and defense of plant meats

Perspective: Soy-based Meat and Dairy Alternatives, Despite Classification as Ultra-processed Foods, Deliver High-quality Nutrition on Par with Unprocessed or Minimally Processed Animal-based Counterparts

Nature: Ultra-processed foods: how functional is the NOVA system?

Plant-based animal product alternatives are healthier and more environmentally sustainable than animal products

Defense of plant meats against misinterpretation by NOVA

The shift to plant-based diets: are we missing the point?

Misinformation from NutriRECS

https://pubmed.ncbi.nlm.nih.gov/33963733/

https://pubmed.ncbi.nlm.nih.gov/31959642/

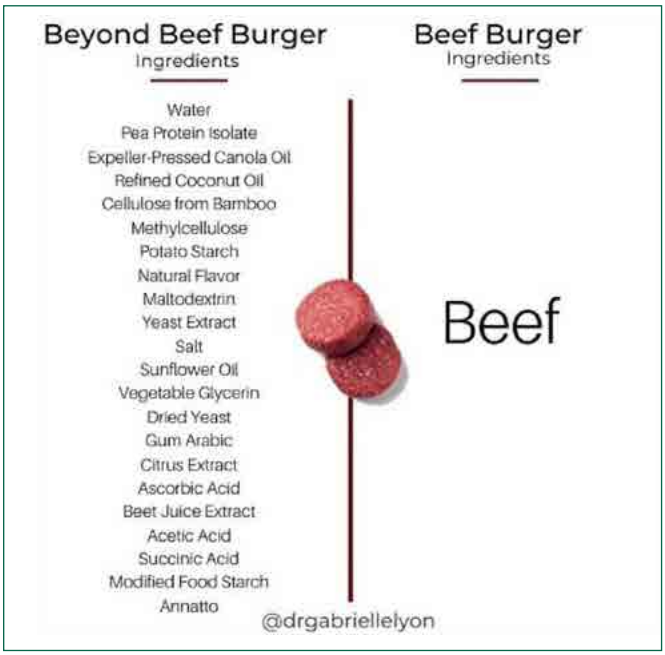
https://www.truehealthinitiative.org/news/true-health-initiative-respectfully-disagrees/

Attacking Plant-based Innovation

How did the rise and popularity of plant-based and animal-free alternatives, like Beyond Meat and Impossible Foods, go from a public perception of a promising innovation in food modernization, climate action, and harm reduction to suddenly being associated with junk food like Twinkies and dog food?

There were many factors that led to this, but one major reason is that it was a coordinated campaign to label these plant-based alternatives as unanimously unhealthy, fake, ultra-processed, and full of planet-damaging and unhealthy seed oils.

> *"It was as if after those initial few years of enjoying eco- and animal-friendly plant-based burgers, sausages and tenders, conscious consumers suddenly turned the packaging around and read the ingredients. There they discovered the now notorious "long list" of scary components like refined coconut oil, potato starch and sunflower lectin. And that was it for some — back to beef. It was almost as if the meat industry orchestrated the whole thing itself." Jessica Scott-Reid*



For comparison, here's the full list of contents in animal-sourced foods:

Ground beef from a cow

Ingredients:

Water (63%), **Triglycerides** (19%) (Oleic Acid (7%), Palmitic Acid (5%), Stearic Acid (3%), Palmitoleic Acid (1%), Myristic Acid (<1%), Trans-Fatty Acid (<1%), Linoleic Acid (<0.5%), Margaric Acid (<0.5%)), Pentadecanoic Acid (<1%), Conjugated Linoleic Acid (<1%), Margaroleic Acids (<1%). **Protein** (17.6%) (Alanine (1%), Arginine (1%), Aspartic Acid (2 %), Glutamic Acid (3%), Glycine (1%), Histidine (1%), Isoleucine (1%), Leucine (2%), Lysine (2%), Methionine (<1%), Phenylalanine (<1%), Proline (1%), Serine (<1%), Tyrosine (<1%), Valine (<1%)). Less Than 2%: Acetic Acid, Ash, Heme, Glucose, Ribose, Glycerol, Fructose, Taurine, Creatine, E306 (Tocopherol), E260 (Acetic Acid), E160A (Beta Carotene), E101(Riboflavin), Histamine, Cadaverine, Putrescine, Cholecalciferol (Vit D), Thiamine, Cyanocobalamin (Vit B12), Folate, Niacin, Pantothenic Acid, Vitamin B6, Aluminum, Calcium, Cobalt, Copper, Iron, Magnesium, Phosphorus, Potassium, Sodium, Thiamin, Zinc. **Flavors:** 2,5-Dimethyl-Pyrazine, Acetoin, 2,3-Butanedione, 1-Hydroxy-E-Propanone, Hexanal, Benzeneacetamide, 1-Pentanol, 1-Octen-3-Ol, 2,3-Pentanedione, 1-Hexanol, E,E-2,4 Decedienal, Methional, Pentanal, (E)-2-Decenal, Butyrolactone, 4-Penten-2-Ol, Tetradecanoic Acid, Tetradecanoic Acid, 4-Hydroxy-4-Methyl-2-Pentanone, 5-Methyl-5-Hexen-2-One, Formamide, 2,4-Di-Tert-Butylphenol, Fufural, Alpha-Actin, Myosin-2, Fructose-bisphosphate aldolase A, Serum albumin precursor, myosin-7, Creatine kinase M, Cytoplasmic-actin, Myosin-8, Beta-enolase, Myosin-4, Carbonic anhydrase, Myoglobin, Glyceraldehyde-3-phosphate dehydrogenase, Myosin-6, Pyruvate kinase, Myosin light chain, myosin-3, L-lactate dehydrogenase, Myosin regulatory light chain, Triosephosphate isomerase.

All-natural chicken breast

INGREDIENTS: WATER (74.8%), **AMINO ACIDS** (23.1%) (GLUTAMIC ACID (15.9%), ASPARTIC ACID (9.5%), LYSINE (9%), LEUCINE (8%), ARGININE (6.4%), ALANINE (5.8%), ISOLEUCINE (5.8%), VALINE (5.3%), GLYCINE (5.2%), THREONINE (4.5%), PROLINE (4.4%), PHENYLALANINE (4.2%), SERINE (3.7%), TYROSINE (3.6%), HISTIDINE (3.3%), METHIONINE (2.9%), CYSTINE (1.4%), TRYPTOPHAN (1.2%)) **FATTY ACIDS** (1.2%) (OLEIC ACID (29%), PALMITIC ACID (25%), LINOLEIC ACID (20%), STEARIC ACID (12%), ARACHIDONIC ACID (5%), PALMITOLEIC & SAPIENIC ACIDS (4%), DOCOSAHEXAENOIC ACID (DHA) (2%), MYRISTIC ACID (1%), A-LINOLENIC ACID (1%), DOCOSAPENTAENOIC ACID (DPA) (1%), GLYCEROL, CHOLESTEROL, RETINOL, ANTIOXIDANTS (E300, E306), VITAMIN K (2-METHYL-1,4-NAPHTHOQUINONE), BETAINE, EMULSIFIER (E1901), FOLATE, ACIDITY REGULATOR (E375), **COLORS** (E120 AND PANTOTHENIC ACID), COBALAMIN (VITAMIN B12), PYRIDOXAL 5'-PHOSPHATE (VITAMIN B6), **CHICKEN FLAVOR** (2-METHYL-3-FURANTHIOL), **OTHER FLAVORS** (2-FURFURYLTHIOL, METHIONOL, 2,4,5-TRIMETHYL-THIAZOLE, NONANOL, 2-TRANS-NONENAL, MONOETHYL SUCCINATE, PHENYLETHYL ALCOHOL, ETHYL LACTATE, 3-HEXANOL, DIETHYL SUCCINATE, CYCLOPENTHYL METHYL KETONE, 3-PENTANOL, HEXANAL, 4-VINYL-2-METHOXYPHENOL, LIMONENE, E260, ISOAMYL ALCOHOL, 3-HYDROXY-2-BUTANONE, 5-METHYL FURFURAL, 4-NONANONE, (E)-3-HEXEN-1-OL, 3-PENTEN-2-OL, 2-FURAN METHANOL, 3-METHYL PENTANOIC ACID, (E)-2-HEPTENAL, 2,3-DIMETHYLPHENOL, E1519 BENZYL ALCOHOL, BUTANOIC ACID, PHENOL, ETHYL-4-HYDROXYBUTANOATE, PENTANOIC ACID, 2-FURALDEHYDE, 1-HYROXY-2-PENTANONE, BENZOPHENONE).

Phenylketonurics: Contains phenylalanine. Around 50% of U.S. chicken breast contains faecal bacteria (E. faecalis). Also contains Campylobacter, Escherichia coli (E. coli) and Salmonella. Cook thoroughly before consumption.

Ingredients of an all-natural egg

INGREDIENTS: AQUA (75.8%), **AMINO ACIDS (12.6%)** (GLUTAMIC ACID (14%), ASPARTIC ACID (11%), VALINE (9%), ARGININE (8%), LEUCINE (8%), LYSINE (7%), SERINE (7%), PHENYLALANINE (6%), ALANINE (5%), ISOLEUCINE (5%), PROLINE (4%), TYROSINE (3%), THREONINE (3%), GLYCINE (3%), HISTIDINE (2%), METHIONINE (3%), CYSTINE (2%), TRYPTOPHAN (1%)); **FATTY ACIDS (8.9%)** (OCTADECENOIC ACID (45%), HEXADECANOIC ACID (32%), OCTADECANOIC ACID (12%), EICOSATETRAENOIC ACID (3%), EICOSANOIC ACID (2%), DOCOSANOIC ACID (1%), TETRACOSANOIC ACID (1%), OCTANOIC ACID (<1%), DECANOIC ACID (<1%), DODECANOIC ACID (<1%), TETRADECANOIC ACID (<1%), PENTADECANOIC ACID (<1%), HEPTADECANOIC ACID (<1%), TETRADECENOIC ACID (<1%), HEXADECENOIC ACID (<1%), EICOSENOIC ACID (<1%), DODOSENOIC ACID (<1%), OMEGA-6 FATTY ACID, OCTADECADIENOIC ACID (12%), OMEGA-3 FATTY ACID, OCTADECATRIENOIC ACID (<1%), EICOSAPENTAENOIC ACID (EPA) (<1%), OMEGA-3 FATTY ACID: DOCOSAHEXAENOIC ACID (DHA) (<1%)); **SUGARS (0.6%)** (GLUCOSE (30%), SUCROSE (15%), FRUCTOSE (15%), LACTOSE (15%), MALTOSE (15%), GALACTOSE (15%)); **COLOUR** (E160c, E160a), E306, E101; **FLAVOURS** (PHENYLACETALDEHYDE, DODECA-2-ENAL, HEPTA-2-ENAL, HEXADECANAL, OCTADECANAL, PENTAN-2-ONE, BUTAN-2-ONE, ACETALDEHYDE, FORMALDEHYDE, ACETONE); SHELL (E170), ALSO CONTAINS BENZENE & BENZENE DERIVATIVES, ESTERS, FURANS, SULFUR-CONTAINING COMPOUNDS AND TERPENES.

As plant-based milk unit sales grew 19% from 2019 to 2022, compared to animal-based milk, which saw unit declines of 4% over the same period, plant-based meats were beginning to show trend increases that they'd potentially displace some animal-sourced foods in certain markets. However, this TV ad during the 2020 Super Bowl to select markets showed kids in a spelling bee trying to pronounce the names of ingredients in plant-based meats that was the beginning of a coordinated campaign sponsored by Washington lawyer and lobbyist Richard Berman and Center for Organization Research and Education called Cleanfoodfacts.com.

Consumers began associating plant-based meats with processed foods and describing it as fake meat with chemicals from these targeted campaigns that also had ads in The New York Post, USA Today, and Wall Street Journal.

This evolved to social media influencers, mainstream media, and a disinformation campaign that took a life of its own. More recently, Twitter, Instagram, and Tik Tok are full of posts and memes claiming that canola (rapeseed), corn, cottonseed, grapeseed, rice bran, safflower, soy, and sunflower oils are toxic and claimed to be inflammatory, heart disease promoting, and leaders in deforestation, despite Harvard scientists debunking this.

The ingredients in plant-based alternatives are compounds derived from plant fibers and used to bind or thicken all kinds of foods, like bread, cake, ice cream and chocolate. Sowing misinformation around products with health and environmental disaster consequences, in an industry funded ploy to delay positive action and change, is as critical of an issue to solve as any.

All to say as well, the plant-based industry does still need to consider the healthfulness of their products, not just the environment and ethical implications. This can start with lower fat and sodium versions, a diversity of plant-proteins, and fortification.

LEARN MORE:
- Desmog: Center for Organizational Research and Education (CORE)

Food Security

Billions of people worldwide, especially those in underprivileged regions, are affected by the ramifications of animal agriculture on global food security. Much of the land and water resources in the global South are used for rearing livestock or growing crops for animal feed, primarily serving the global North and wealthy populations globally. These resources are diverted away from the world's poorest people, leading to increased food prices and scarcity in their regions. Consequently, animal agriculture is one of the major contributors to global food insecurity. Additionally, the rise in consumption of animal products, along with highly processed animal and plant foods, is linked to an increase in chronic diseases and mortality rates.

Food security will continue to be used as a tool by rich countries and meat advocates to justify delaying changes away from their industry, increasingly showing up from academics in rich countries.[237] The Dublin Declaration and a recent attempt by the FAO to justify the production and consumption of the highest polluting foods, and discounting plant-based alternatives, will be explored below.

LEARN MORE:

- >1/3 of global crop yield used for animal feed, only 12% of calorie inputs return as food: https://iopscience.iop.org/article/10.1088/1748-9326/8/3/034015/meta
- Global calorie loss from feed conversion exceeds all food waste: https://www.pnas.org/doi/10.1073/pnas.1713820115
- 800 million people could be nourished with feed grain from US alone: https://news.cornell.edu/stories/1997/08/us-could-feed-800-million-people-grain-livestock-eat
- FAO estimated in 1993 that 800 million people suffer from hunger, ironically recommending animal farming: https://www.fao.org/3/v8180t/v8180t07.htm
- The Fishing industry drains enormous quantities of nutrients from nutrient-insecure countries for export to the Global North: https://www.pnas.org/doi/full/10.1073/pnas.2120817119
- The Fishing industry is a primary driver of hunger in Asia: https://brill.com/display/book/9789004522657/BP000012.xml
- Africa loses $11.5B annually to illegal fishing, slashing subsistence fishers' incomes nearly in half in 15 years: https://adf-magazine.com/2023/03/six-west-african-countries-account-for-20-of-worlds-illegally-caught-fish/
- 90% of fish processed for fishmeal are food-grade: https://onlinelibrary.wiley.com/doi/10.1111/faf.12209

United Nations FAO Industry Manipulation

The United Nations Food and Agriculture Organization is a large organization, with varying perspectives and levels of industry input, not all of which are consistent. The FAO, arguably, made the most impactful statement concerning the environmental perils linked to animal farming for human consumption in 2006, when they published a 391-page report titled "Livestock's Long Shadow".[238]

In it, authors stated that animal agriculture constitutes a "significant environmental threat" with far-reaching consequences, deserving a central position in environmental policymaking. The report emphasized that "[t]he livestock sector is a major contributor to climate change, accounting for 18 percent of greenhouse gas emissions measured in CO2 equivalent, surpassing the emissions from transportation."[239]

This call for action was also firm, as Henning Steinfeld, Chief of FAO's Livestock Information and Policy Branch, declared, "Livestock significantly contribute to today's most critical environmental issues, demanding immediate intervention" (FAO, 2006). Dr. Rajendra Pachauri, the chair of the United Nations Intergovernmental Panel on Climate Change (IPCC), repeatedly advocated for reducing meat consumption as a means to mitigate climate change. As covered in this analysis, "In terms of quick and feasible measures to achieve substantial reductions, this is a highly attractive option. Start by giving up meat for one day [per week], then reduce further."[240] The compelling evidence led Yvo de Boer, then the executive secretary of the UN Framework Convention on Climate Change (UNFCCC), to suggest, "The most effective solution would be for all of us to adopt a vegetarian diet" (BBC, 2008).[241]

So what happened since? The animal agriculture industry increased efforts and integration within the FAO ever since, and notably the global GHG estimate for animal agriculture has been dropping ever since, despite herd sizes increasing. Industry tied academics also began proactively shaping the debate while never disclosing, or being required to disclose, conflicts of interest. One researcher leading the attack on the report, Frank Mitloehner, received thousands from the Beef Checkoff Program specifically for this research, and 5% of the five million dollars in funding he has received since 2002 has come explicitly from the beef industry (Wright, 2009). Recent exposés of his motives only further highlight this reality.

While the GHG narrative didn't fully stick, as meta-analyses flagged certain issues, it did delay action.[242] Now, two recent 2023 reports with direct ties to the animal agriculture industry push an alternative narrative that meat and dairy are needed for food security:

The UN's Food and Agriculture Organisation (FAO):
Contribution of terrestrial animal source food to healthy diets for improved nutrition and health outcomes: An evidence and policy overview on the state of knowledge and gaps

a. This report was overseen, edited and influenced by the Global Dairy Platform, International Dairy Federation, International Meat Secretariat, International Natural Sausage Casing Association, and International Poultry Council. The wider LEAP FAO program openly discloses private funding and partnerships with these organizations.[243]

b. The first part of the four-part report is a "narrative review" of the nutritional value of animal foods. This approach lacks external guidelines and comprehensive evidence, making the conclusions prone to subjective interpretation and bias. For example, the report claims that meat protein is "high quality," an assertion based on the DIAAS metric that rates meat proteins above plant proteins. However, this is a contentious point and multiple studies and reviews suggest that plant proteins are absorbable, complete, and sustainable when cooked and combined.The "high quality protein" myth talking point flies in the face of peer-reviewed research & reviews that show plant proteins are absorbable, complete, and sustainable.[244]

c. The subsequent parts of the report, while exhibiting a pro-animal bias, include findings that contradict the report's headlines and key messages. A significant portion of the new analysis examines the gaps in countries' dietary guidelines, identifying a lack of specificity and the absence of sustainability recommendations. Despite these findings, the report paradoxically concludes that all countries should provide guidance on animal food consumption.

d. The presence of representatives from industry groups serving as both funders and reviewers introduces a concerning conflict of interest. The report fails to differentiate between low-income countries with nutritional deficits across multiple food groups and high-income countries where most people consume more than adequate protein.

e. The UN FAO must urgently re-evaluate its standards for commissioning reports and distributing media content. The apparent financial conflicts, the use of misleading headlines, subjective methodologies, and the absence of skeptical and independent review call into question the validity and objectivity of the report. The influence of industry biases throughout the key messages and headlines also suggests a potential motive to increase meat consumption, irrespective of the inherent risks and environmental impacts.

The FAO report included funding from Ireland, France, Poland, Switzerland, Brussels CAT Network, Global Dairy Platform, International Dairy Federation, International Meat Secretariat, International Natural Sausage Casing Association, and International Poultry Council.

CLAIM **MEAT AND DAIRY ARE KEY FOR FOOD SECURITY**

REALITY *"Growing food exclusively for direct human consumption could, in principle, increase available food calories by as much as 70%, which could feed an additional 4 billion people (more than the projected 2–3 billion people arriving through population growth)" Cassidy et al., 2013*

Professor Walter Willett at Harvard T.H. Chan School of Public Health noted in the Boston Globe that "No single human activity has a bigger impact on the planet than the production of food… The whole system is unimaginably dysfunctional; it's destroying our environment and our health at the same time." He's published over 2,000 original research papers including ones that link frequent red meat consumption to increased risk of some types of cancer, heart disease, and diabetes. The 2019 EAT-Lancet Commission report called for global cooperation and commitment to shift diets towards healthy, plant-based dietary patterns.[245]

Dr. Walter Willet's name was used in the FAO Food Security report, which prompted him to respond as follows when notified of his conveyed participation and endorsement:

> *"This report (FAO one) is designed to provide support for animal agriculture and is extremely unbalanced and inaccurate in many ways. The conclusion that consumption of 9 to 71 grams per day of red meat is safe is absurd and not supported by any evidence that is cited. Such a statement would require null results for all important endpoints with tight confidence intervals across that range of intakes. Vast amounts of evidence show the opposite. Notably Fabrice and I are both listed as advisors without disclaimers, which would appear to convey endorsement. Fabrice had strongly critical comments and I don't remember seeing this document at all (and can't find any trace of it in my emails). We will be asking to have our names removed. Unfortunately, there isn't a specific response mechanism like a letter to the editor. However, you can be assured that Eat Lancet 2.0 will be based on evidence for both health and environmental outcomes."*

Email from Professor Walter Willett

On May 17, 2023, at 9:22 AM, Willett, Walter C. <wwillett@hsph.harvard.edu> wrote:

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Maybe something like the Oldway's Common Ground approach would be appropriate. Another ongoing effort is the Dietary Guidelines Advisory Committee, which has a solid membership at present. The translation to Guidelines is a different issue as there is every reason to be concerned that report will be corrupted by the USDA like last time.

Walter

Note: Dr. Willet's and Fabrice DeClerck's names were since removed from the report as of August, 2023:

The document also benefited from the reviews of numerous external reviewers from academia, civil society organizations, governments and private sector organizations. FAO would like to thank the following reviewers and organizations in particular:

- **Fabien Abraini** (Università di Corsica Pasquale Paoli, France)
- **Asma Boughalmi** (Institut Agronomique et Vétérinaire Hassan II, Morocco)
- **Fabrice DeClerck** (Alliance Bioversity International – International Center for Tropical Agriculture, Italy)
- **Phil Garnsworthy** (University of Nottingham, United Kingdom of Great Britain and Northern Ireland)
- **Julie Lovegrove** (University of Reading, United Kingdom of Great Britain and Northern Ireland)
- **Sophie Prache** (National Research Institute for Agriculture, Food and the Environment, France)
- **Nathu Ram Sarker** (Bangladesh Livestock Research Institute, Bangladesh)
- **Christine Stewart** (Institute for Global Nutrition, University of California Davis, United States of America)
- **Cleopas Gathara Wahome** (Naivasha Sheep and Goat Station, Kenya)
- **Walter Willett** (Harvard Medical School, United States of America)
- **Kate Wingett** (University of Sydney, Australia)
- **Animal Task Force** (Florence Machenz)
- **Global Dairy Platform** (Mitch Kanter)
- **International Dairy Federation** (Erica Hocking, Allen Sayler, K. Jordan, Frieda Wiechmann)
- **International Meat Secretariat**
- **International Natural Sausage Casing Association** (Philip Corrigan)
- **International Poultry Council** (Nicolò Cinotti)

The review of the first draft of this component document resulted in more than 1 400 comments being received from members of the scientific advisory committee, experts across several disciplines, organizations representing civil society, the private sector, multistakeholder partnerships (Global Agenda for Sustainable Livestock), research and academia, and United Nations organizations (World Health Organization). The revised draft was presented to COAG's Sub-Committee on Livestock at its first session, reviewed by its Members and revised accordingly.

Varun Chaudhury, Claudia Forte and Rama Jalab supported awareness raising about the assessment.

Claudia Ciarlantini and Cristiana Giovannini designed some of the figures and the cover. The manuscript was laid out by Cristiana Giovannini. Administrative and secretarial support was provided by Antonella Falcone, Kirlia Fassi-Fihri, Valerie Pierre and Barbara Vermeil.

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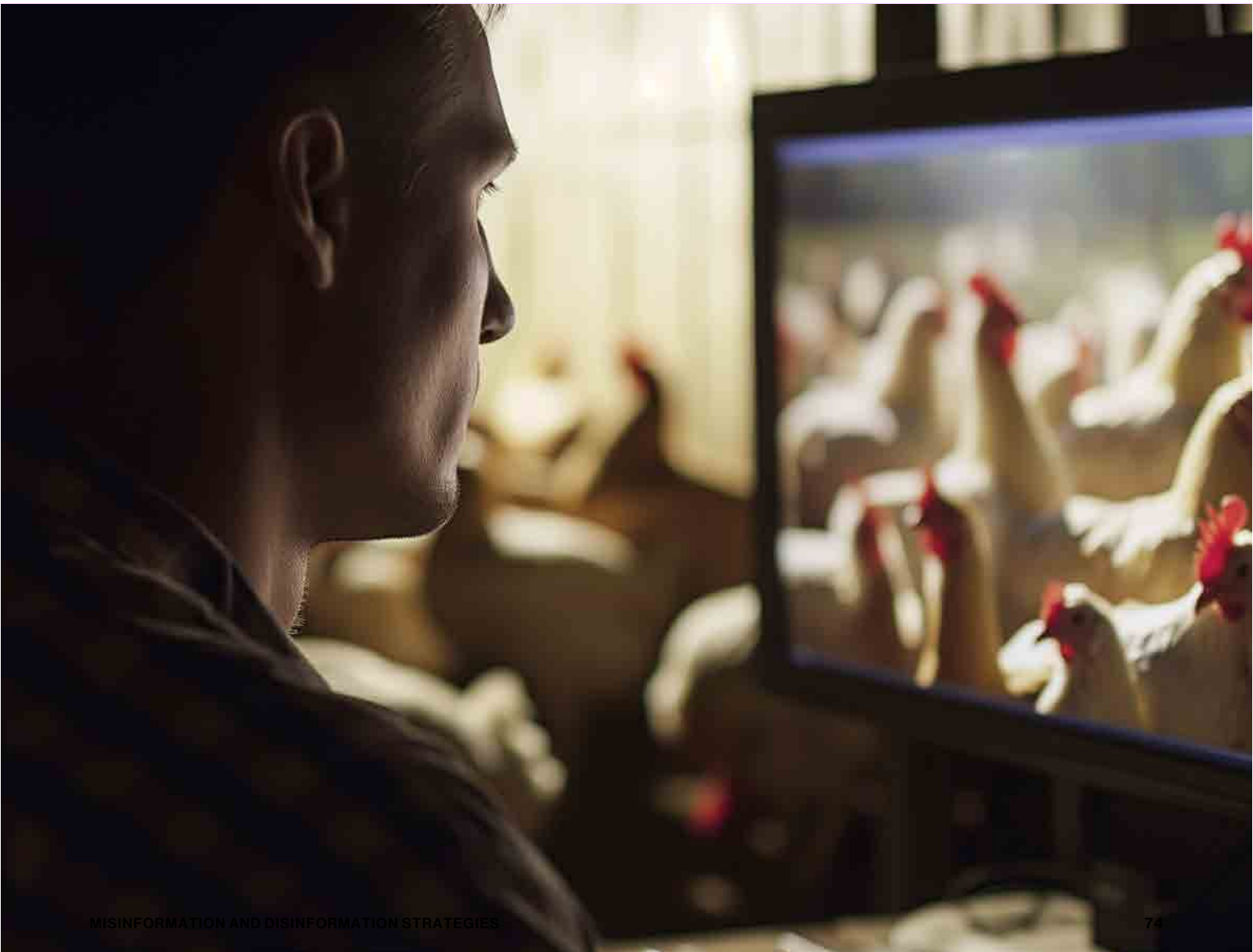


The Dublin Declaration Consensus Tactic

This manifesto was launched at the Irish government agricultural agency Teagasc in late 2022, who lent both funding and their credibility to this partnership with the meat industry.[246] A group of industry friendly academics "organised an international two-day summit in Dublin, entitled 'The Societal Role of Meat - What the Science Says', with the purpose of achieving a comprehensive synopsis of the scientific evidence, which was then formalised in a series of articles... The summit gave birth to the Dublin Declaration (2022), which has the intention to give voice to the many scientists around the world who research diligently, honestly and successfully in the various disciplines in order to achieve a balanced view of the future of animal agriculture" (Leroy et al. 2023[247]).

> *"Livestock systems must progress on the basis of the highest scientific standards. They are too precious to society to become the victim of simplification, reductionism or zealotry. These systems must continue to be embedded in and have broad approval of society. For that, scientists are asked to provide reliable evidence of their nutrition and health benefits, environmental sustainability, socio-cultural and economic values, as well as for solutions for the many improvements that are needed. This declaration aims to give voice to the many scientists around the world who research diligently, honestly and successfully in the various disciplines in order to achieve a balanced view of the future of animal agriculture."*
>
> *The Dublin Declaration of Scientists on the Societal Role of Livestock*

Media Snippets

International Meat Secretariat applauds reaffirmation of livestock's critical role in sustainable food systems

Media: The Telegraph

Media: NY Post

Media: UN

Even vegan writers fell for the campaign: Guardian

Here are the main arguments of the declaration:

- **Nutrition:**
  The declaration emphasizes that livestock-derived foods provide a variety of essential nutrients that may be lacking in diets, especially in under-resourced communities. They express concern over negative health impacts such as stunting, wasting, and anemia that could arise from protein and nutrient deficiencies in communities consuming less meat.
- **Livestock Systems:**
  The declaration underscores the societal value of livestock systems and rejects any simplification aimed at marginalizing them.
- **Research Critique:**
  The group also takes issue with the Global Burden of Diseases, Injuries, and Risk Factor Study, which claims that high red meat consumption contributes significantly to global mortality. They found the study flawed and are advocating for its retraction.
- **Broader Social and Economic Implications:**
  The declaration also alludes to the broader socio-economic implications of the reduction or elimination of meat consumption. It suggests that promoting a meat-free diet may adversely affect the livelihoods of those who rely on livestock systems, potentially creating economic instability.

Many points rely on half truths, like the reality that animal farming provides basic food security in under-resourced countries. This is complex and oversimplified. And new research shows the reduced resilience to come by focusing on animal farming as a source of basic needs in often increased environmentally damaged areas:

> *"Cattle farming could no longer be viable (due to increased heat) in places where it is currently a major occupation, for example in India, Brazil, Paraguay, Uruguay and north-eastern Argentina, and across the Sahelian and east African countries." Phys.org.*[248]

This declaration is a call for so-called balance and rationality claiming the increasing trend to shift to plant-based is an oversimplification, is reductionist and infused with zealotry. Zealotry, the fanatical and uncompromising pursuit of religious, political, or other ideals, appeared in numerous media headlines immediately after the report was announced. Articles published subsequently justified high meat consumption in rich countries, describing anyone who opposed this as militant, and provided little evidence on how this continued issue would not hurt livelihoods throughout ecosystem destruction. Red Flag, with the North American Meat Institute (NAMI) among its clients, was responsible for crafting press releases and formulating promotional tactics for the Dublin Declaration yet one of the leading contributors, Peer Ederer, claims to have no knowledge of who hired them.[249]

Retrieved from Boren (2023) from a Red Flag brochure (2018)

The articles discuss the nutritional value of animal-based foods, including red meat, and suggested that neglecting meat in dietary recommendations would bring harm to under-resourced communities. The industry disputes the idea that red meat consumption is harmful to health and detrimental to the environment with a campaign focused instead on meat consumptions' vital role in food security.

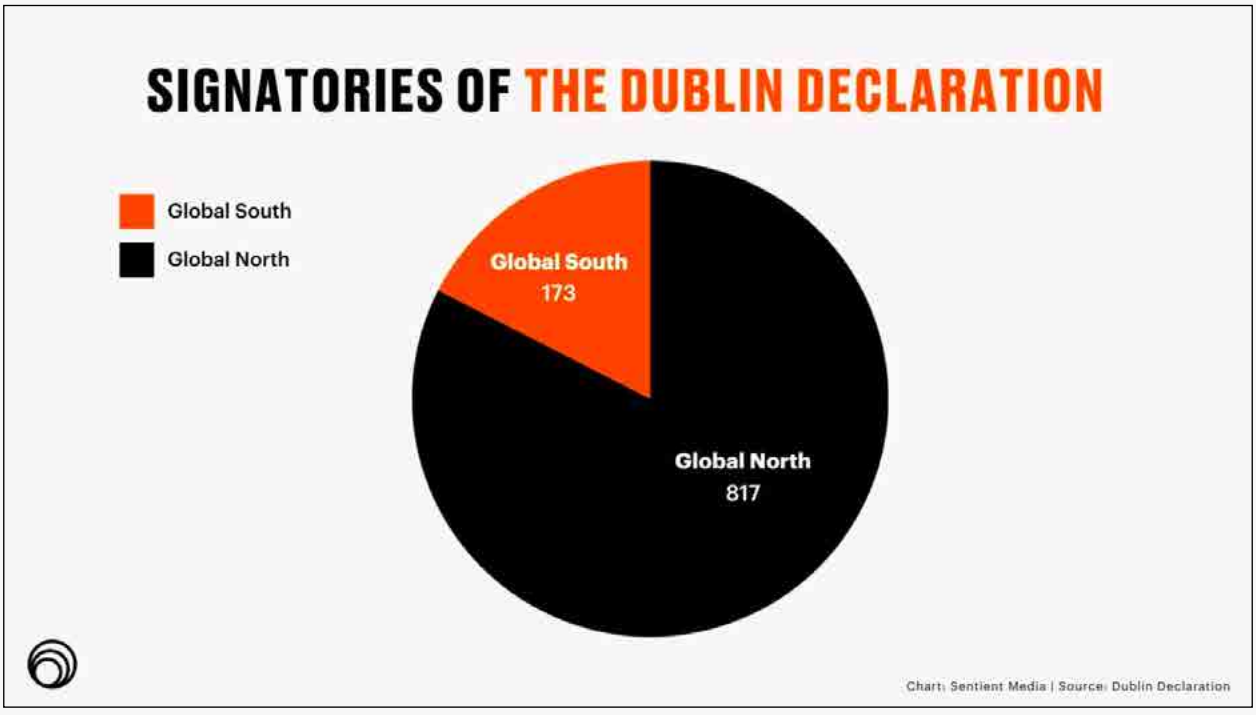
The Dublin Declaration purports to rely on a 'centered' or 'balanced' approach to dietary recommendations, urging the importance of meat consumption, especially in under-resourced communities and the Global South. However, it features no serious analysis of the impacts of animal agriculture, its impacts on socioeconomic status, livelihoods, and overall wellbeing over time.

The Dublin Declaration campaign was an alignment of the animal agriculture industry supporting representatives attempting to escape accountability. A correspondence in the journal Nature Food addressed a few of the issues including stating that the globalizing of Western high-meat diets "is both quantifiably unachievable within the planetary resource base and unnecessary to meet human dietary requirements."[250] It calls for pragmatism amidst an industry suffering extreme impacts from environmental issues they've contributed to.[251] Yet several hundred pages of emails, meeting records, and additional documents obtained via freedom of information requests by investigative journalists unveil that the Declaration was authored, published, and endorsed by animal agriculture industry advisors.[252] It has subsequently been utilized by trade associations and lobbyists to resist environmental policies, particularly in Europe but a new version is supposedly in the works for Colorado.[253]

The Dublin Declaration "overlooked or downplayed research demonstrating the incompatibility of current and projected levels of consumption of animal products with the imperatives of bringing humanity's economy within the planetary biophysical limits, that is, making it sustainable."[254]

CLAIM **WELL-RESOURCED INDIVIDUALS MAY BE ABLE TO MAINTAIN A HEALTHY DIET WITH HEAVY RESTRICTIONS ON MEAT, DAIRY, AND EGGS, BUT THIS MIGHT NOT BE A FEASIBLE APPROACH FOR GENERAL POPULATIONS.**

REALITY *Extensive scientific research has demonstrated that well-balanced plant-based diets can easily meet all nutritional requirements, with only minimal supplements like B12 that's also supplemented to farmed animals. Despite normalized animal production and consumption, diverse populations eat fully plant-based and making it more accessible is a feasible approach for individuals and societies to increase adoption for improved well-being and environmental sustainability.*[255]



Sourced from: https://sentientmedia.org/dublin-declaration-animal-industry/

EU Commission and European livestock stakeholders are using the Dublin Declaration as an argument to attempt to discredit plant-based diets. They're also citing this report, which states that meat is healthy and while admitting that we need to eat a little less, also underlining that meat is good for you.[256]

The Dublin Declaration came out of the International Summit on the Societal Role of Meat with an extensive list of supporters within the animal agriculture industry including lobby groups, and those profiting off its economic growth.[257] Published in Animal Frontiers, whose board is made up of representatives from just five industry organizations: the American Society of Animal Science; the Canadian Society of Animal Science; the European Federation of Animal Science; the World Association of Animal Production and the American Meat Science Association.[258]

Who are the Signed Experts?

At first glance, the experts have an impressive list of credentials next to their names, but a closer look reveals dietitian Diana Rodgers from Sacred Cow and a list of others in the .Global North working within the animal agriculture industry, calling to avoid change in the very resource rich countries they reside in.

Sixteen individuals who have signed the document are employed by The Agriculture and Food Development Authority, an Irish organization that delivers training and guidance to the agriculture and food sectors.

Of the signatories, most were from high meat consuming countries including the United States (107), Spain (105) and France (77).[259,260] Of course many may have no strong conflicts of interest, but those with financial ones indeed indicate the highest likelihood of confirmation bias. It is widely established that financial conflicts of interest impair objectivity and integrity, consciously or unconsciously.[261]

Beyond signatories, the origin of the manifesto in the first place had suspected close ties with the animal agriculture industry including:

- Dr Collette Kaster, chief executive of the American Meat Science Association (AMSA), which is funded by major meat producers such as Cargill, Smithfield and Tyson.
- Dr Mohammad Koohmairaie, head of the meat division at food research company IEH Laboratories, who has clients from "various companies including those from the meat sector".[262]
- Professor Frédéric Leroy who is a food science academic at Vrije Universiteit Brussels, president of the Belgian Association for Meat Science and Technology, and a regular presence on the meat industry conference circuit. He is also the author of Aleph 2020, an academic-led initiative in support of meat production.
- Dr Rod Polkinghorne, a self-described "pioneer of the Australian feedlot industry" who works with meat industry actors – such as the Australian Meat Processor Corporation and Meat & Livestock Australia – through his consultancy, Birkenwood International.
- Peer Ederer stated that he has commercial customers in the livestock sector but insisted no company told him or members of the organising committee to launch this initiative, or paid for their work on it.[263]

After the investigations from Boren (2023) and others, the Dublin Declaration website now includes a conflict of interest explainer.

> *"The Dublin Declaration contradicts the consensus positions of clinical nutritional scientists and their professional associations, who are tasked with reviewing up-to-date information in a rigorous, skeptical, and systematic way. They have found that while some nutrients are lacking in vegetarian and vegan diets, if those diets are well-planned, they can provide all of the necessary nutrients to survive and thrive. Dissenting views are welcome, but if researchers do contract the consensus, they need to provide evidence that's abundant, novel, and high-quality. The Dublin Declaration, and all of their associated articles, fail to provide that evidence on all three fronts."* Dr. Matthew Hayek

LEARN MORE:

- Revealed: The livestock consultants behind the Dublin Declaration of Scientists
- Revealed: the industry figures behind 'declaration of scientists' backing meat eating

Education

The education system in various countries has been infiltrated by animal agriculture trade groups in the following ways:

- Mandatory dairy in american schools
- Banning meatless days
- Influencing educational curriculums
- Industry board members

To improve how schoolchildren learn about the impacts of food choices, it is *critical* to remove the animal agricultural industry's education in schools. Many countries allow school curricula to be influenced by industry, essentially providing these companies with marketing platforms where they often disseminate health and environmental disinformation.

The reach of the dairy industry in schools is alarming and will be a focus of this quick analysis. For decades, the dairy industry has successfully targeted schools as one of its largest audiences. Dairy products are the number one source of saturated fat in many diets and, when consumed regularly, are linked to a higher risk of heart disease, type-2 diabetes and certain types of cancer. Despite this evidence, dairy and meat associations around the world continue to be allowed to target youth through broad programs (e.g. school lunch programs and free educational activities or modules) and targeted campaigns (e.g. grants for coffee programs). Of course, industry also aggressively markets to children outside of school, such as the dairy industry's current "#UndeniablyDairy" Tik Tok campaign that aims to increase dairy consumption in traditionally low dairy consuming areas like China and Southeast Asia, despite high rates of lactose intolerance.

Industry "education" for children draws on biased industry-funded studies that make claims that are not supported by the totality of scientific evidence. The results of such studies are four to eight times more likely to support the interests of the industry and are essentially advertising tools that mislead schools into promoting food choices that are worse for both their students' health and the environment. In 2018, Health Canada removed dairy from the Canada Food Guide and yet these programs, which are tantamount to direct and harmful marketing campaigns to children, still exist. Schools can have a *major impact* by removing industry funded "education" from curricula. See the below list of a few influences on curricula:

- 4H program - LEAP (Leaders for Ethics, Animals & the Planet) as alternative
- Dairy educators - Canada
- Marielle Williamson's experience with USDA & school district at Eagle Rock High School and lawsuit.
- Got Milk targeted racialized individuals with high rates of lactose intolerance.

LEARN MORE:

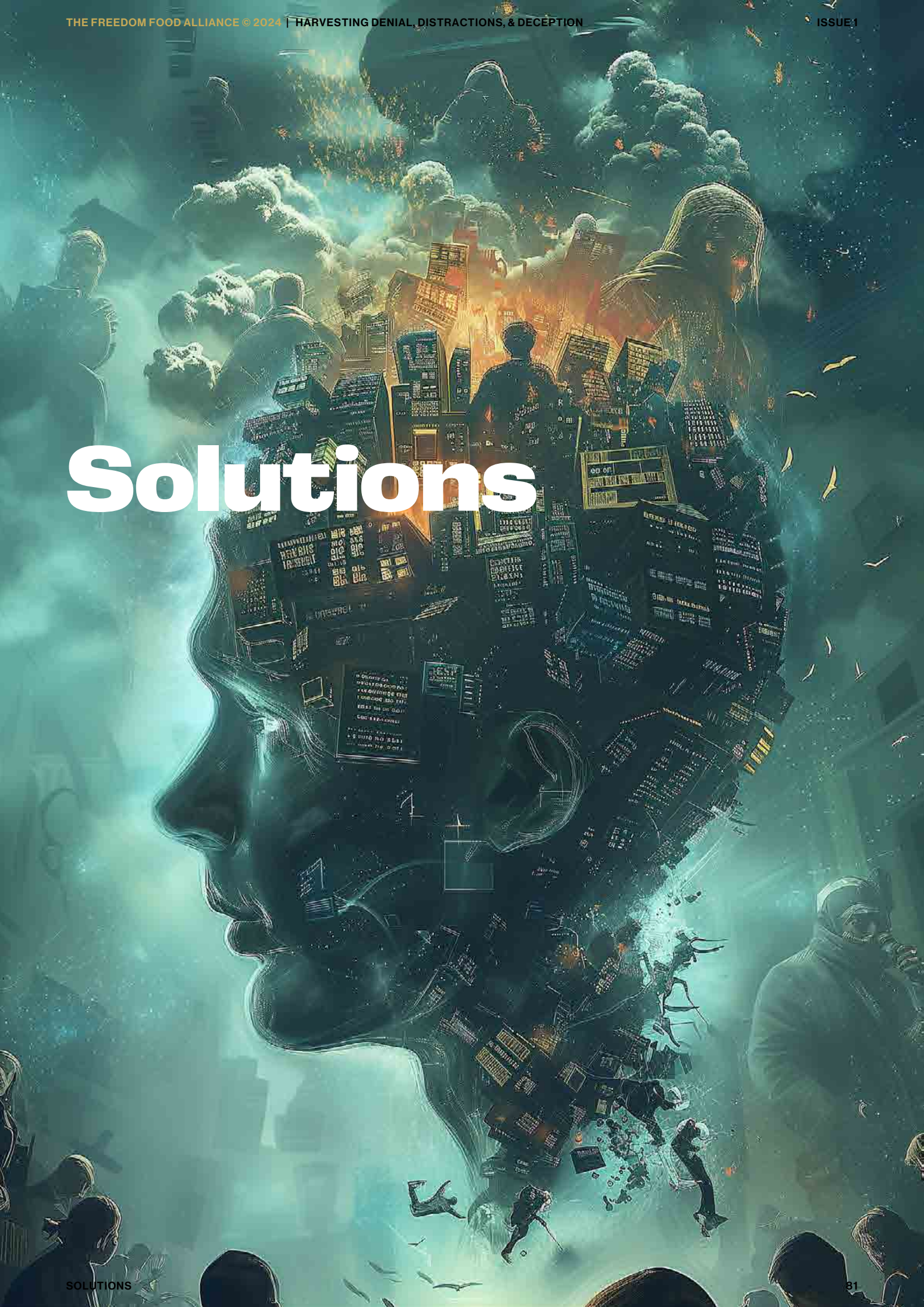
- PlantBasedData.org: Dairy's Impact on the Environment: A review of the state of the dairy's impacts on the planet
- Kaufman, E. J., & Tan, C. (2022). White as milk: Biocentric bias in the framing of lactose intolerance and lactase persistence. Sociology of Health & Illness, 44(9), 1533-1550.
- Bertron, P., Barnard, N. D., & Mills, M. (1999). Racial bias in federal nutrition policy, Part I: The public health implications of variations in lactase persistence. Journal of the National Medical Association, 91(3), 151.

Master of Beef Advocacy

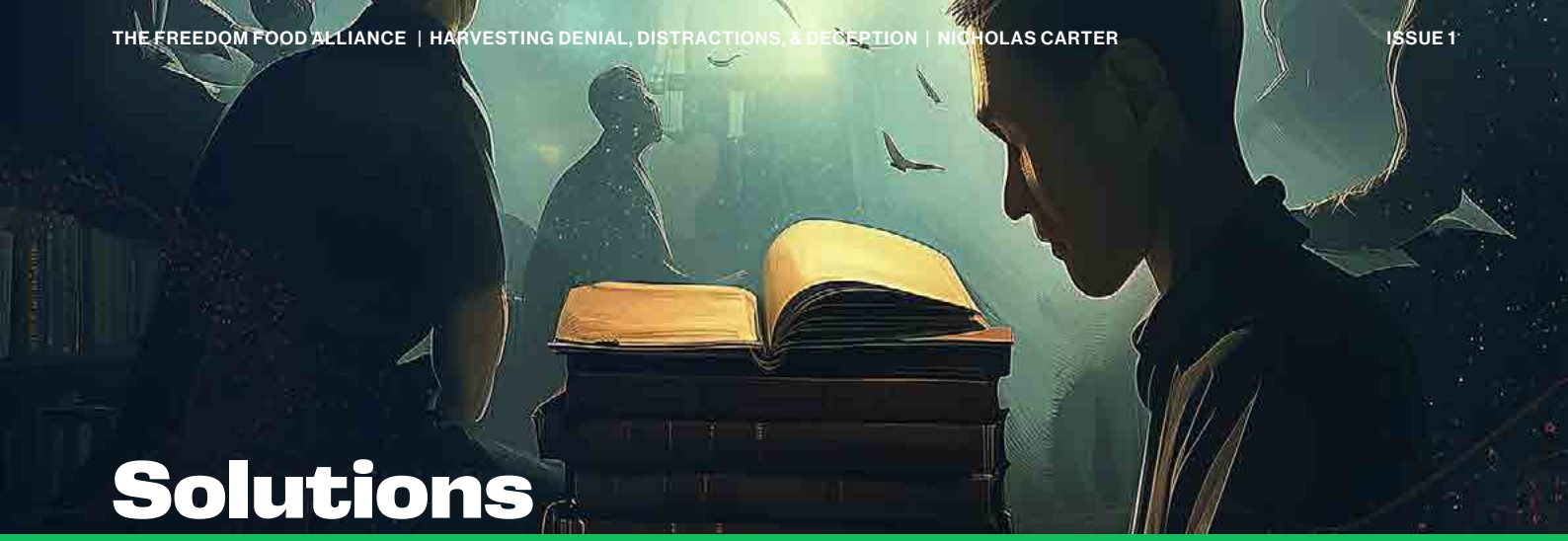
The Masters of Beef Advocacy (MBA) program is a free, self-guided online training course developed by the National Cattlemen's Beef Association (NCBA) in the United States in 2020 and has since had 21,000 graduates. 70 percent of NCBA's funding comes from the Beef Checkoff Program. The NCBA claims it has represented America's cattle producers since 1898, preserving the heritage and strength of the industry through education, public policy and working to create new markets and increase demand for beef. This program is designed to equip beef producers, industry partners, and enthusiasts with information to become informed advocates for the industry. The training covers six course modules including beef safety, beef nutrition, animal care, environmental stewardship, modern beef production, and the beef checkoff.

Beyond this specific program, there is a broader influence of animal agriculture on various levels of education. In some cases, K-12 curriculum materials are created by the animal agriculture industry, presenting a favorable perspective on livestock farming, often emphasizing the industry's economic benefits while downplaying environmental and health concerns. This might manifest in lesson plans, textbooks, or class activities provided directly by industry groups. The impact can also be seen in colleges and universities, where research or academic programs might be funded by industry, potentially shaping the focus of research or the framing of issues in ways that align with industry interests.

The livestock industry uses messaging, public relations strategies, and even legal action to maintain its influence and interests in the educational realm and public sphere. Industry groups often sponsor research and promote certain narratives that minimize the environmental and health impacts of meat consumption, while emphasizing the economic importance of the livestock industry. This type of advocacy may also extend to efforts to prevent laws or regulations that might negatively affect their interests.



Solutions



Solutions

Effective strategies to counter misinformation require a multi-pronged approach. They should include:

Strengthening Media Literacy	Equipping individuals with the ability to critically evaluate the information they consume is a crucial step towards mitigating the impact of misinformation.
Engaging with the Public	Scientists, researchers, and other experts must actively engage with the public to share accurate, accessible, and timely information, fostering trust, and understanding.
Promoting Transparent Communication	Transparent communication about the research process and findings can help prevent misconceptions and ensure accurate understanding.
Building a Collaborative Industry Network	Organizations across sectors need to collaborate to counter disinformation, ensuring a consistent and cohesive response.
Leveraging Technology	Technology can be used to develop systems for identifying and flagging disinformation and misinformation, while also amplifying accurate information based on credible peer-reviewed science.

Below summarizes some, but not comprehensively all, solutions to consider:

AI and Satellite Tracking

New tracking tool monitoring Amazon deforestation in meatpacker supply chain

- Global Witness, an NGO, developed an online tool last year with the purpose of monitoring and revealing deforestation connected to the indirect supply chain of the Brazilian meat company, JBS.
- The tool, called Brazil Big Beef Watch, operates as a Twitter bot, utilizing satellite data and cattle transit permit information to identify if a ranch where deforestation was observed is part of JBS's supply chain.
- Global Witness says the new tool aims to serve as a way to call on JBS to take action and for the company's financers to stop backing it until JBS can prove that its supply chain is deforestation-free.
- When exploring data from 2022, the tool revealed that at least 61 deforestation events occurred, averaging 46 hectares (ha) of land cleared every single week in Pará alone. The yearly total of 2,390 ha of clearance is equivalent to 3,347 football pitches.

LEARN MORE:

- New tracking tool launched to monitor Amazon deforestation in meatpacker supply chain
- A Twitter bot tracks meat production in the Brazilian Amazon

Satellite imagery recording livestock movements and deforestation

- Researchers at the AidEnvironment consultancy used satellite imagery, livestock movement records and other data to calculate estimated forest loss over six years, between 2017 and 2022 on thousands of ranches near more than 20 slaughterhouses. All the meat plants were owned by Brazil's big three beef operators and exporters – JBS, Marfrig and Minerva.
- Climate TRACE is now training artificial intelligence to identify cattle production facilities worldwide based on satellite images. They have also built models that relate cattle numbers from wastewater permits to satellite images showing each facility. Once trained, the AI system and modeling effort should be able to estimate the number of cows from satellite images of cattle-feeding operations in places that lack reliable permitting data.

Sample of 983 direct JBS suppliers and 1,874 indirect JBS suppliers

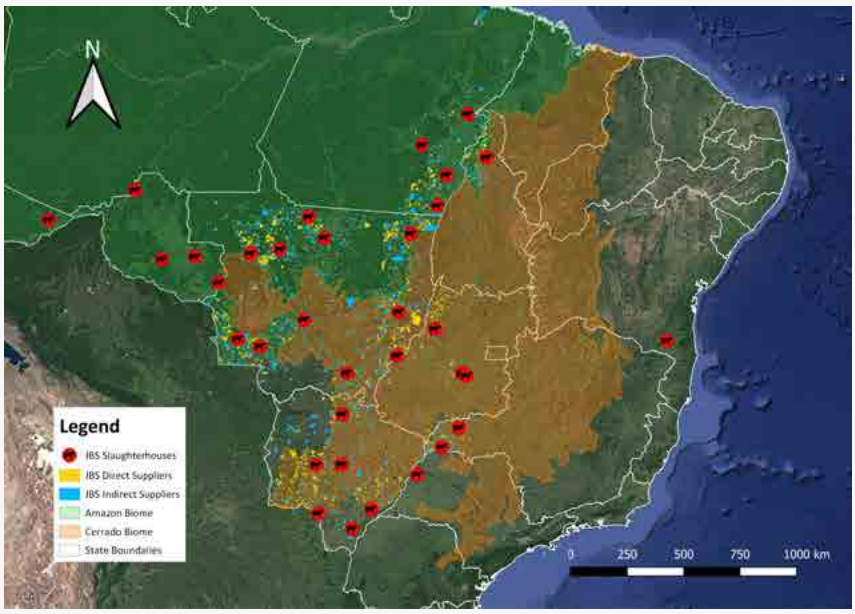


Image sourced from:
https://chainreactionresearch.com/report/jbs-outsized-deforestation-in-supply-chain-covid-19-pose-fundamental-business-risks/

AI cost-effectively analyzing aerial imagery for methane over dairy feedlots in California

- California's dairy sector contributes approximately 50% of the state's human-caused CH_4 emissions in its GHG emission inventory. The available geospatial information for California dairy facilities is based on data that is over a decade old, despite variations in the facilities' locations and herd sizes over time. To address this issue, researchers have introduced AI to analyze aerial imagery and estimate dairy CH_4 emissions in California's San Joaquin Valley (SJV), an area that accounts for approximately 90% of the state's dairy herd population.[264] This analysis included observing the isotopic signatures confirming differences in each origin of methane.

- The AI method processed 316,882 images to predict the facility-scale herd size across the SJV.
  - The results of the AI's predictions exhibited a strong correlation (>95%) with those made through human visual inspection, offering a cost-effective alternative to the labor-intensive inventory development process. This new application of AI to estimate dairy emissions is a significant advancement, providing a more accurate and efficient means of monitoring and understanding the environmental impact of the dairy sector in California.

LEARN MORE:

- Environmental Science & Technology: Artificial Intelligence Approach for Estimating Dairy Methane Emissions
- NASA Earth Observatory: Mapping Methane Emissions in California

High-resolution satellite imagery to remotely monitor Marine Protected Areas (MPAs)

- New research shows that high-resolution satellite imagery (VHR; 0.3–0.6 m spatial resolution) provides a much-needed tool for monitoring sentinel species in remote oceans, which would strengthen current and future MPA research and monitoring programs across the globe.[265]

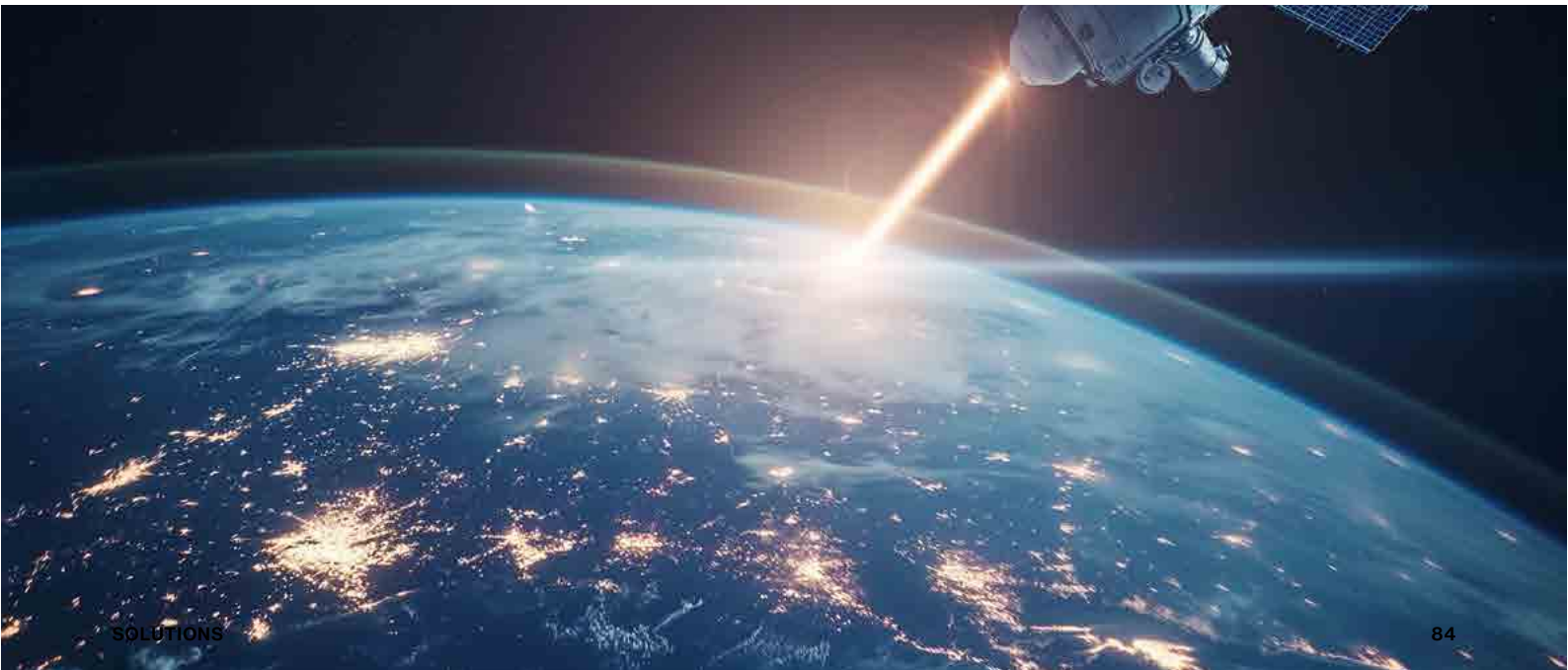
- MPAs are few and far between. Several reasons for this include the lack of an overarching legal mechanism for designating MPAs in high-seas areas, which is changing, and having the economic ability to enforce it. New technologies can help here.

- Fishing vessels are required to carry a transponder that tracks their movements and allows authorities to monitor their behaviour. But illegal fisher people simply switch off the machine, thus disappearing from the system.

- Synthetic Aperture Radar (SAR) picks up radar wave reflections from boats at sea even if their other tracking tools are switched off, creating an image that is then relayed to authorities. SAR is especially useful for visualizing boats in remote locations or during periods of bad weather when other technologies, such as Very High Resolution satellite imagery, are less effective.

LEARN MORE:

- Global Fishing Watch
- Introducing Global Fishing Watch's revolutionary technology



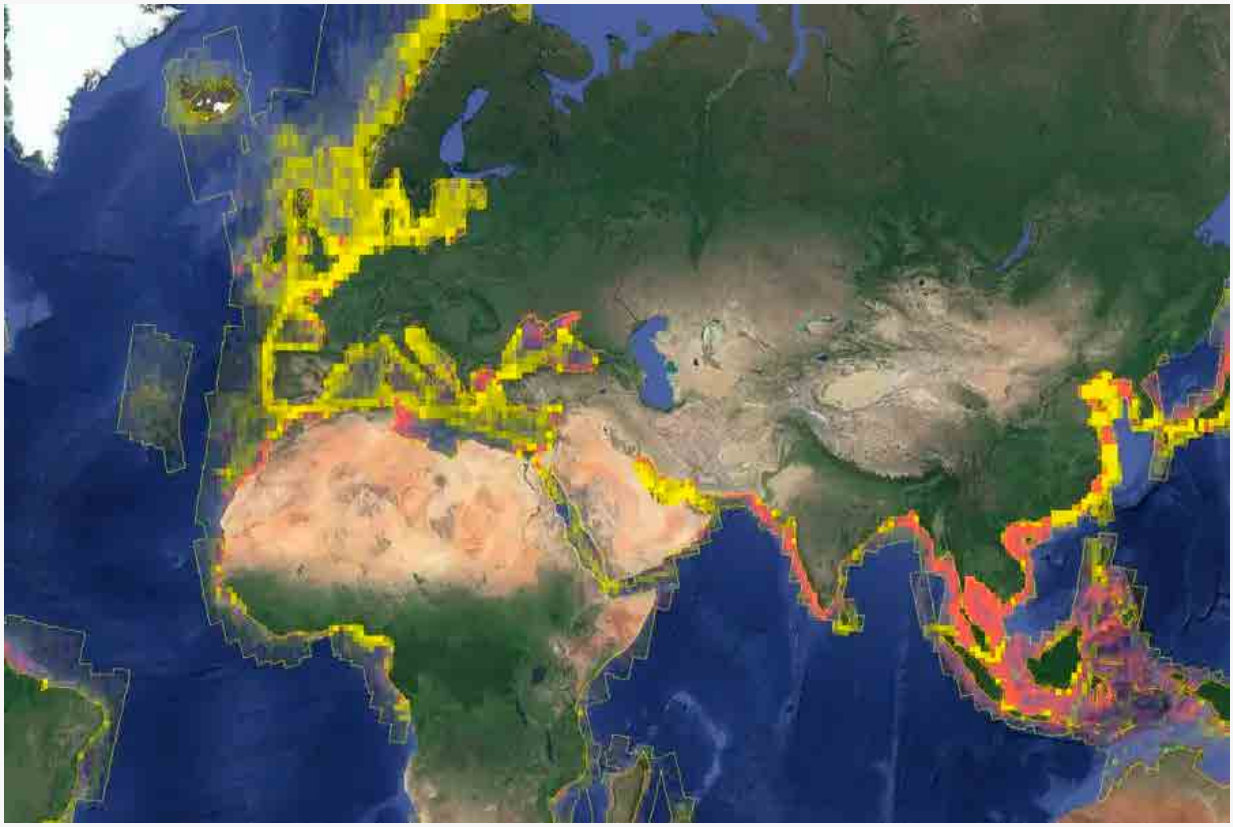
Global satellite map will help hunt down illegal fishing vessels

- Using computer-vision algorithms to crunch through new satellite images and shipping location data has revealed areas where ships may be catching seafood illegally.[266,267]

- Industrial fishing has a footprint that is four times larger than agriculture, encompassing a minimum of 55% of the Earth's oceans.[268] Utilizing data from a new digital platform (Global Fishing Watch, 2018), it has become possible to remotely monitor vessels at sea, leading to new insights.[269,270] This technology enables the tracking of activities conducted by over 70,000 industrial fishing vessels during the years 2012 to 2016. A striking observation is that a mere five countries (China, Spain, Taiwan, Japan, and South Korea) are responsible for up to 85% of fishing activities in the remote ocean regions. Global hot spots for fishing are concentrated in the northeast Atlantic (Europe) and northwest Pacific (China, Japan, and Russia), as well as in upwelling regions off the coasts of South America and West Africa.

- Instead of employing people to look through specific satellite images – which can take several hours per image – we can now use computer-vision algorithms to look through every single satellite image recorded in a matter of minutes.

A Global Fishing Watch map can identify coastal waters where ships are operating incognito



Global Fishing Watch – Sourced from: https://www.newscientist.com/article/2324588-global-satellite-map-will-help-hunt-down-illegal-fishing-vessels/

AI Social Media Countermeasure

AI machines can detect fake news to some extent but human intervention is also important in identifying misinformation.[271] An efficient conceptual model has been proposed to counter the misinformation spread on social media:

- **Tools that visualize the spread of articles online.** Hoaxy was developed to collect, detect and analyze the online misinformation on social media through fact-checking. Hoaxy was created by researchers from the Indiana University Network Science Institute (IUNI) and the School of Informatics and Computing's Center for Complex Network and System Research (CnetS). This tool allows researchers, educators, and the general public to discern the factors that impact the spread and validation of misinformation.

- **Misinformation checker websites** - IT experts and software developers have created numerous fact-checking websites to combat the dissemination of false information. These platforms, including BuzzSumo.com, Politifact.com, FactCheck.org, and Snopes.com, serve as essential tools for verifying the accuracy of content. For instance, BuzzSumo.com is a prominent tool for identifying popular and relevant content, thus helping users discover the most viral stories on social media and shielding them from irrelevant material. Politifact specializes in fact-checking political statements, rating their accuracy from "Mostly True" to "Pants on Fire." Factcheck.org concentrates on ensuring the factual correctness of statements in American politics, with a primary focus on claims made by U.S. politicians. Snopes.com plays a crucial role in debunking myths and rumors circulating on social media through extensive fact-checking research. A platform specific to food and the environmental and health implications would be helpful.

- **The Naïve Bayes Classifier** - is a set of algorithms based on a shared principle. It uses probabilities to decide if a news article is fake by counting certain words in the headline. This count is turned into a probability, helping to determine if the headline is likely real or fake.

- **Automatic Detection** - Detecting false news is a challenging task because of the constant influx of fake information on social media. To address this, automated detection systems are essential, requiring minimal human involvement. The PHEME project in 2018 was created to attempt to automatically detect rumors or half-truths. In 2016, they provided a dataset comprising 1972 rumors, 3830 non-rumors, and 5 breaking news events. This model assesses the accuracy of information that appears credible but is difficult to verify, creating reasonable doubts and uncertainty. PHEME operates within a 4-way typology involving support, denial, inquiry, and commentary.[272]

Risk Analysis

Meat and dairy giants face $24bn of climate-related losses by 2030

- The 'business-as-usual' plans of 40 companies mean they are on track for a global warming pathway of 2°C or more – a level which would render vast swathes of the planet 'unliveable' according to an analysis by investor network FAIRR who convenes members with more than $70trn of assets under management.

- The analysis suggests that in a 2 degree Celsius scenario, each company would see an average of a 7% reduction in profit margins, representing $27.3bn overall. The hit would be harder for North American companies, which can expect an average 11% decrease in profit margins.

Why is this?

- Physical climate impacts resulting in higher feed and fertilizer prices.
- Increased animal sickness and mortality rates.
- Transition-related and regulation-related risks, such as carbon taxes.
- The potential impact of such profit decline could result in half of the companies under assessment incurring net operating losses, including Tyson Foods, the largest meat producer in the US, and Cal-Maine, the largest egg producer.
- According to a recent analysis by the World Bank, Brazil faces $317 billion in annual losses due to Amazon deforestation.[273] The value is seven times higher than profits from commodities taken from the rainforest, the report concludes.

Risk analysis can help these companies address such concerns:

- Of the 40 meat and dairy companies assessed, 6 of them (15%) have conducted and published a climate scenario analysis. Scenario analyses enable companies to assess risks and opportunities in various future warming and regulatory scenarios.
- While more than half of the companies acknowledge risks relating to increased crop prices, only one quarter disclose plans for mitigating this risk. Two-thirds do not disclose the potential impact of heat stress on operations or supply chains.[274]

Many multilateral development banks stopped financing coal over a decade ago, have recently stopped funding oil & gas, and now even ended support of large scale hydropower. These are important signs for the need for wider divestment from the most environmentally damaging industries, shifting support to better alternatives.

A Researcher at Nature Finance at the Oxford Sustainable Finance Group (Smith School of Enterprise and the Environment) recently made a strong case for environmental accountability of animal agriculture, and ultimately a major shift away from this industry given its track record of leading in deforestation, methane, and many other Earth system metrics.[275]

- 88% of publicly listed meat & dairy companies - supplying to the likes of McDonalds, Nestlé, & Tesco - don't track their methane emissions (2019 FAIRR survey).

- 93% of the listed meat & dairy firms - world leaders in deforestation - don't even have a deforestation policy in place (2019 FAIRR survey).[276]

- JBS, the world's biggest meat company, has been asked by the National Advertising Review Board (US's ad watchdog) to stop making net-zero claims that are not backed by actual measures. Yet here is the JBS CEO pushing the narrative without accountability. JBS even raised green bonds on the back of its net-zero commitment even though the commitment excludes scope 3 emissions, which constitute 97% of its footprint.

Financial institutions that choose to stay invested remain exposed to the risk of loan defaults and asset stranding.

Signs of change:

- Norway's Government Pension Fund and northern Europe's largest asset manager Nordea Asset Management divested from JBS in 2020 and 2018.

- The International Finance Corporation put off its loan to Brazilian dairy giant Alvoar Lacteos amid concerns over its scope 3 emissions.

- The Inter-American Development Bank (IADB) dropped its $43 million USD loan to Marfrig's Brazilian beef operations.[277]

With full scope of emissions including third-party supply chains - and impacts beyond GHGs - risk assessments will make it even more clear why we need a major reduction in livestock numbers. With this basic accountability strategy and demand-side changes in rich countries who disproportionately consume the most, norms may change.

Major meat companies see potential in plant-based meats:

- Cargill has invested in Puris, an impressive organization that is the leading producer of pea protein in North America, a commonly utilized component in plant-based meats.
- They've also invested in Enough, a Dutch company that has created a protein and fiber-rich food ingredient from fungi through fermentation, utilized in various vegan food products.
- They also have financial involvement in Bflike, a Belgian food-tech firm whose plant-based components are employed in crafting imitation meat and fish.

Supporting diversified non-centrally owned plant-focused agroecology, and demanding size changes towards alternative plant proteins, are key low-risk high-reward solutions to strive for even as major meat companies begin investing in plant-based and animal-free proteins.

ACTION STEPS

- ➔ Engage with invested companies and projects to collect better climate risk data and information on environmental, social and governance (ESG) topics;
  - Divest from firms lagging behind;
  - Explore alternative investment opportunities in alternative proteins

Note: As argued in 'Butchering the Planet' and 'Bankrolling the Butchers,' meat giants are mostly making token gestures, akin to oil companies' minimal renewable investments, aimed at maintaining their main, environmentally harmful businesses. Many call for divesting from such firms, emphasizing that their core operations make them irreformable

LEARN MORE:

- FAIRR: Meat and dairy giants face $24bn of climate-related losses by 2030

Legal Accountability for Downplaying Impacts

What happens legally when organizations downplay impacts over time at the detriment of people and the planet?

Shell and ExxonMobil are learning these lessons now. For decades, they've been aware of, kept hidden and misinformed the public about the detrimental effects of their industry on the environment. Long before this knowledge became widespread in the public consciousness, internal documents and studies from these corporations indicated a clear understanding of the catastrophic consequences of their activities, particularly with regards to human-caused global warming.[278] Despite this knowledge, these companies actively worked to downplay, dispute, and obfuscate the science behind climate change, effectively delaying meaningful action to address the issue.

In recent years, ExxonMobil, Shell, and other oil giants have faced legal scrutiny and numerous lawsuits over their actions.[279] These suits accuse them of misleading investors and the public about the risks associated with fossil fuel use, alleging they knowingly contributed to the acceleration of climate change while publicly disputing its existence and severity. The legal consequences they now face serve as a reminder of the profound responsibilities held by industries that have a significant environmental impact.

On the other hand, with animal agriculture in the United States, they're being given huge subsidies to try to figure out how to make their operations more eco-friendly.[280] USDA is funding "climate smart" agriculture in an attempt to help the U.S. reduce its emissions, 10 percent of which come from agriculture. Tyson is the lead partner on a project that just received a $61 million grant from the USDA to work on "Climate-Smart Commodities."

Some parties are now attempting to sue the USDA and the NCBA because the Beef Checkoff operates unconstitutionally and uses funds to benefit meatpackers at the expense of small ranches. The claim shows that the Beef Checkoff-funded ads allow meatpackers to pay producers less for their beef and their ads promote all beef as a sustainable dinner option.

From Colombia and Germany to the Netherlands, concerned citizens and young people have taken their governments to court and won. No industry has had more widespread environmental damage than animal agriculture when factoring in more than just climate change but also eutrophication, land use and deforestation, biodiversity loss, water use, etc, and it's likely it will soon face legal consequences.

LEARN MORE:

- Desmog: How Shell downplayed early warnings over climate change
- Client Earth: Greenwashing Files
- The Mystery of Climate Friendly Beef

Regulation of Industry Climate Transition Plans

Greenwashing is the outcome of the system we're operating within, so it has to be regulated with full force, while trying hard to change the system. The below are a couple of key examples of strong efforts to address this misinformation.

EU Parliament Votes to Require Companies to Introduce Climate Transition Plans

- The EU Parliament voted in favor of new rules that require companies to address their impact on human rights and the environment and the need to implement climate transition plans. The rules are part of the proposed Corporate Sustainability Due Diligence Directive (CSDDD) and apply initially to companies with over 500 employees and more than €150 million in revenues, extending to smaller companies later.

- The directive requires companies to integrate due diligence into their policies, identify and mitigate adverse impacts, and cover company operations, subsidiaries, and value chains. A significant change from the initial proposal is the requirement for companies to implement climate transition plans aligned with the Paris Agreement's objective to limit global warming to 1.5°C, including scope 1, 2, and 3 emissions.

- Companies failing to comply may face sanctions and supervisory measures, such as fines up to 5% of global revenues or bans from EU public procurement. The inclusion of climate transition plans in the rules is considered groundbreaking and reflects a shift towards corporate responsibility for sustainability.

EU to ban 'climate neutral' claims by 2026: Brussels to crack down on greenwashing of consumer products

- The EU plans to ban misleading environmental claims like "climate neutral" and "eco" by 2026, requiring companies to prove the accuracy of such claims to address greenwashing.

- The ban will also cover claims based on emissions offsetting, which are often used to assert that products are carbon neutral or environmentally friendly, as well as green labels not from approved sustainability schemes.
  - The rules may outlaw vague environmental phrases like "green," "energy efficient," and "biodegradable" unless products can demonstrate excellent environmental performance.

- This change would make the EU one of the strictest regions in terms of regulating environmental claims made to the public. There's also UK-specific anti-greenwashing rules going in place.

- The law on green claims aims to address the issue of carbon offsetting schemes lacking credibility and relying on flawed carbon accounting practices.

- The EU's anti-greenwashing measures go beyond labeling. Companies will be required to declare product lifespans, ensuring transparency about durability and guarantees. Repairability and product guarantee claims must also be substantiated. This will particularly affect tech companies making claims about software updates and repairability.

Banning prodcuts

There is a pressing need to oversee the promotion of unhealthy food to children. It is inappropriate for companies to advertise unhealthy and ecologically damaging foods to kids. Increased efforts are needed to address this. Barely any efforts are in place to even attempt to address this.

The challenge lies in the realm of politics. Efforts to regulate marketing aimed at children have proven unsuccessful since the late 1970s. Executives from food companies assert that marketing to children is crucial for them. They rely on children influencing their parents, fostering lifelong consumer habits, and forming emotional connections to products they cherished in their childhood.[281]

Managed Transition Support

Herd reduction incentives

Netherlands

The European Commission recently announced its endorsement of two Dutch proposals totaling 1.47 billion euros ($1.61 billion) for the acquisition of livestock farmers' operations as a strategy to curtail nitrogen pollution. The Commission stated that these plans adhere to state aid regulations. The Netherlands is confronted with the necessity to lower excessive nitrogen levels, partly attributed to years of intensive agricultural practices. This concern has resulted in court-imposed obstructions on significant construction endeavors until a resolution is achieved. Animal farm buyouts and incentives for science-backed restoration are an important step toward a comprehensive plan to address the issue.

- The manner in which it was communicated ignited a flurry of protests that reshaped the country's political landscape, including the formation of a right-populist party, BoerBurgerBeweging, that now sits in the country's parliament. The importance of clear communication, media outreach, and considering stakeholders is a lesson here.

Ireland

As reported in The Journal: The country's Agriculture Minister says farmers are 'very much up for' a scheme that would see a reduction in dairy herds. The numbers of dairy cows in Ireland will have to be reduced by up to 65,000 cows per year up to 2025 if the agriculture sector is to meet its climate reduction targets. The sector has been tasked with cutting its carbon emissions by 25% by the end of the decade.

- The Food Vision Dairy Group report from 2022 report suggests a "voluntary exit/reduction scheme" that would pay interested farmers for culling cows and not replacing them for five years or for exiting the dairy industry altogether.

Support to farm differently

With policy changes now being put in place to help change agricultural practices, transition plans are needed. The examples below are somewhat niche and small, yet are important to signal the possibilities ahead.

- Transfarmation - A farmer-led movement for a better food system, the team has already helped many transition specifically from farming chickens to mushrooms.

- Rancher Advocacy Program - Designed to be a platform that addresses complex issues that arise when farm and rancher family members transition to a non-animal practice including health, ethical, environmental, financial, social and practical support in order to create a viable transition plan and solution as well as make strategic partnerships in order to convert their farm or ranch to a business that collaborates with the growing world and economic trends towards a plant-based future.

- Farm Transitions Australia - Working with farmers to create a more sustainable future for farmers and their families, consumers, and the planet. Farm Transitions Australia is a registered charity, established to assist Australian meat and dairy farmers transition into more sustainable forms of agriculture, business or career changes. They provide free business advisory and support services to farmers to help them build a better future for them and their families via a financially-viable business and improved mental well-being, away from the stresses of their current farming situation.

- Many other groups are attempting this work but are beyond the scope of this analysis to include.

A recent study with a team of scientists presented a five-step approach through which governments can plan a transition away from high levels of meat production and consumption that is fair and just for affected stakeholders.[282] Governments in high-consumption countries should lead the transition, given their resources and high consumption levels.

The strategy for a just transition includes the following principles:

1. Phase out policies and subsidies supporting industrial meat production and ensure buyout strategies target a critical mass of larger, actively producing farms.
2. Promote alternatives to industrially produced meat.
3. Ensure inclusive and participatory planning processes.
4. Provide support to offset the impacts of the transition.
5. Address the root causes of injustices in the meat sector.

This approach aims to balance the economic, social, and environmental aspects of transitioning away from current animal agriculture practices. Several governments (Canada, China, Denmark, the Netherlands and Singapore) are already actively supporting the development of plant-based meat substitutes.[283]

Jonathan Green, a Senior Scientist at the Stockholm Environment Institute, added in Phys.org media coverage of the study:

> *"Planning and support for just transitions in animal agriculture is essential if we are to successfully address the climate, biodiversity, and human health crises. Such an approach can help ensure disruptions are minimized and benefits maximized for workers, rural communities, and others affected by our food system."*

Environment Movement Pressure

Key roles that non-governmental organizations can play in addressing industry disinformation from animal agriculture include:

- **Research and Fact-Checking:** Conduct thorough research to gather accurate and up-to-date information about animal agriculture's environmental impact and the counter solutions. Fact-check claims and statements made by the animal agriculture industry to debunk misinformation.
- **Educational Campaigns:** Develop educational materials, websites, and social media campaigns to raise awareness about the environmental consequences of animal agriculture. Use infographics, videos, and articles to present evidence-based information to the public.
- **Collaboration with Scientists and Experts:** Partner with environmental scientists and experts to strengthen the credibility of the organization's claims. Collaborate on research projects and share findings to back up arguments against misinformation.
- **Community Outreach and Workshops:** Organize community outreach events, workshops, and public talks to engage with local communities. Provide evidence-based information and address common misconceptions related to animal agriculture and its environmental impact.
- **Media Engagement:** Engage with the media to ensure that accurate information about animal agriculture and its environmental impact is presented in news articles, TV shows, and documentaries.
- **Lobbying and Policy Advocacy:** Advocate for policies that promote sustainable and environmentally friendly agricultural practices. Work with lawmakers to develop regulations that address the negative environmental consequences of animal agriculture.
- **Supporting Plant-Based Alternatives:** Promote plant-based alternatives to animal products and showcase their environmental benefits. Collaborate with food companies and restaurants to encourage the adoption of delicious and nutritionally relevant plant-based menu options.
- **Consumer Awareness Campaigns:** Launch campaigns to raise consumer awareness through shifting social norms and showing the environmental impact of dietary choices.
- **Monitoring Industry Practices:** Monitor animal agriculture practices and expose any environmentally harmful activities. Document instances of pollution, deforestation, or other damaging practices and share them with the public and relevant authorities.
- **Collaboration with Other Environmental Organizations:** Work with other environmental organizations to amplify efforts and reach a broader audience. Jointly address misinformation and support each other's initiatives to combat the negative impacts of animal agriculture.

JBS Climate Rating

https://www.mightyearth.org/jbs-climate-rating

"The discourse of European think tanks has made the relationship between the animal-based diet and climate invisible." In the think tanks reviewed, fewer than 5% of them/their publishings included the relationship between the animal-based diet and climate change as their main focus.[284]

Yet a coalition of civil society groups is calling for the Carbon Disclosure Project (CDP) to revoke the A minus score and "Leadership" status recently awarded to meat giant JBS for its climate change efforts.

The groups, including Mighty Earth, Institute for Agriculture & Trade Policy, Friends of the Earth, and others, claim that JBS's high grading is a case of greenwashing due to its significant greenhouse gas emissions and deforestation record. JBS has been accused of misleading investors with green bonds and lacking a credible decarbonization plan.

The groups urge CDP to reassess its climate scoring methodology and consider independent evaluation and verification of companies' performance on emissions reduction. They also call for transparency in reporting and the inclusion of specific criteria for scoring companies within each level.

The significance of collaborations between private and public entities becomes apparent when addressing misinformation surrounding meat consumption and advocating for plant-based diets grounded in reputable scientific findings. The movement championed by the EAT Foundation (Planetary Health Diet), stands out as a prime example of how partnerships can elevate political discussions around meat.

In 2019, the EAT-Lancet Commission's report classified red meat as unhealthy, proposing limitations on its consumption. This report underlines the importance of well-informed dietary choices and aligns with efforts by various organizations, such as the World Resources Institute (WRI) and the World Wildlife Fund (WWF), which now advocate for plant-forward evidence-based food strategies.[285]

The Food and Land-Use Coalition (FOLU), with its partners EAT and WRI, demonstrates the collaborative approach needed to transform global food systems. By focusing on specific countries and working toward substantial reductions in red meat consumption, FOLU emphasizes the need for policy changes guided by reliable scientific insights.

The C40 Cities initiative unites major cities to pursue a shared goal of implementing the Planetary Health Diet by 2030.[286] This initiative highlights the role of both public and private sectors in promoting dietary shifts that are informed by credible scientific research. After endorsing the C40 Good Food Cities Declaration, the mayors of 184 major cities, including prominent ones like Barcelona, London, Los Angeles, Milan, Paris, Tokyo, and Toronto, have committed to promoting a 'Planetary Health Diet' for everyone by 2030.

New York City, led by mayor Eric Adams, has also become part of this effort at a later stage, actively advocating for a shift in dietary habits through plant-powered Fridays requiring that the main entree served in all public schools each Friday to be plant-based, benefiting the lives of close to one million children in the NYC public school system. He's also put in place significant healthcare default plant-based programs and a comprehensive expansion of lifestyle medicine programs.

In practical terms, the C40 Cities initiative outlines a dual-pronged approach to dietary change. The first is a progressive target, encouraging a reduction to 16 kg of meat and 90 kg of dairy per person annually. The second and more ambitious goal envisions a complete plant-based program by the year 2030. This initiative underscores the collective commitment to fostering plant-based diets that prioritize both individual health and environmental well-being.

In the context of combating meat misinformation, alternative meat products provide an interesting case study. Collaborations between agri-food corporations and organizations like EAT and WEF can potentially drive the adoption of these products based on scientific integrity, responding to evolving dietary preferences.

The synergy between private and public actors is vital for addressing misconceptions about meat and promoting plant-based diets grounded in quality, credible, and up-to-date scientific research. This partnership-driven approach ensures that dietary recommendations are well-informed, resonating across diverse sectors to shape a healthier and more sustainable food system.

Meat Rep Database

An effective solution is the establishment of a centralized database that tracks and identifies individuals directly or indirectly promoting animal-sourced foods through disinformation campaigns.

This database can be curated by independent organizations with scientific expertise in agriculture and environmental issues, but also open source so others can add to this list.

By collating verified information and fact-checking claims, the database can serve as a reliable resource for the public, media, and policymakers.

Increasing accountability through transparency can discourage the dissemination of false or misleading information, thereby fostering a more informed and responsible discussion about animal agriculture's impacts. One can find a record of companies and organizations' current messaging on climate change, lobbying around climate action, and histories of climate science denial, in real time, as started already here: Agribusiness Database.

Expose and Regulate Conflicts of Interest

To tackle this issue, it is essential to impose tangible consequences on professors who neglect to disclose their funding.[287] These disclosures should be comprehensive, encompassing explanations of electronic long-form disclosure statements that can be periodically updated.

Academic Accountability

1. Global academic institutions need a limit on the time and money faculty can spend on and receive from industry or outside sources. This needs to be complemented with more publicly available funds and grants that are not influenced by industry.

2. There needs to be more clear disclosure of outside salary, paid honorarium, speaker fees, gifts.
   - With cancer, scientists with industry ties - due to exposure of tactics with the links between tobacco and cancer - can no longer work on causes of cancer panels or key reports.[288]

3. Conflict of interests need to be a lot clearer
   - More than formal and declared amounts
     Of note: private universities and professors currently don't need to disclose funding or funding sources.
   - Some journals (e.g. Nature) say it's difficult to see where financial ties influence but it needs to be set at a minimum amount above $10,000 USD. Many journals have no policies on conflicts and many industry scientists will exploit that.

4. Create formal punishments for denial and failure to disclose conflicts
   - Scientific misconduct needs to be a lot clearer to make it more difficult for industry to infiltrate and weaponize the scientific community.

Education

Addressing misinformation from animal agriculture in education requires a multifaceted approach that empowers students with critical thinking skills and evidence-based knowledge. Here are some ways education can evolve to tackle this issue:

- **Teach media literacy:** Include media literacy as a core component of the educational curriculum, helping students recognize bias, identify credible sources, and differentiate between fact and opinion in information related to animal agriculture.
- **Incorporate scientific literacy:** Integrate lessons on scientific principles, research methodologies, and peer-reviewed studies to help students evaluate claims about animal agriculture critically.
- **Promote critical thinking:** Encourage open discussions, debates, and analysis of different perspectives on animal agriculture, fostering critical thinking skills and the ability to question and challenge information presented.
- **Use evidence-based materials:** Utilize educational resources that rely on scientific evidence and credible sources to present accurate information about the environmental, ethical, and health impacts of animal agriculture.
- **Encourage field trips and experiential learning:** Visit sustainable farms, animal sanctuaries, and environmental organizations to provide students with first-hand experiences and a more comprehensive understanding of animal agriculture practices.
- **Collaborate with experts:** Involve professionals in the fields of ecology, environmental science, and plant-based manure-free agriculture, nutrition, etc. to provide guest lectures and workshops for students.
- **Integrate cross-curricular learning:** Incorporate animal agriculture-related topics in various subjects, such as science, geography, ethics, and social studies, to provide a holistic understanding.
- **Engage in service-learning projects:** Encourage students to conduct research and take action on issues related to animal agriculture, fostering a sense of responsibility and activism.
- **Encourage critical questioning:** Create a safe environment where students feel comfortable asking questions, challenging ideas, and engaging in open discussions about the complexities of food systems.

LEARN MORE:

- Fighting fake news in the classroom: Misinformation and disinformation are enormous problems online. To help stop the spread, psychologists are increasingly incorporating debunking and digital literacy into their courses.

Maintain Trust In The Scientific Method

While the scientific method is imperfect, and has faced its fair share of ethical concerns throughout history, it incorporates mechanisms to correct mistakes.

A 2021 study in PNAS titled "Misinformation in and about science" states:

- "For all these interventions, few will be effective if the public distrusts science. Pew Foundation surveys* of US residents have revealed declining trust in government, religious organizations, universities, business leaders, news media, and fellow citizens, with young people exhibiting particularly low levels of trust(152, 153). Fortunately, science remains among the few trusted institutions in the United States (154–157); however, that trust is declining in some regions and among some political orientations (158, 159)."[289]
- "We need to develop methods for identifying errors and statistical anomalies (148). We need to consider integrating preregistration (where appropriate) as standard practice to reduce the effects of publication bias, continue to develop tools for open science, and reward those scientists that adhere to these new standards."
- "Nurturing innate curiosity and teaching people to understand how science works, how to consider evidence when making conclusions, and how popular media distorts these conclusions."[290]

A 2017 study in Global Challenges titled "Inoculating the Public against Misinformation about Climate Change" showed that:

- In a large experiment (N = 2167), researchers showed that communicating the scientific consensus on topics like human-caused climate change significantly increased public perception of the expert consensus by about 20 percentage points.[291]
- The scientific consensus clearly shows that the most effective action to reduce GHGs as individuals is to shift to a plant-based diet to reduce GHGs, land use, eutrophication, acidification, biodiversity loss, and overall resource waste.[292]
- Preemptively warning people about politically motivated attempts to spread misinformation helps promote and protect ("inoculate") public attitudes about the scientific consensus.[293]

New York Times: How Finland Is Teaching a Generation to Spot Misinformation:

The Nordic country is testing new ways to teach students about propaganda. Here's what other countries can learn from its success.

While today's adolescents have been exposed to social media from a young age, this does not necessarily equip them with the skills to recognize and protect themselves from altered videos of politicians or misleading news articles on social media platforms. A recent research study published in the British Journal of Developmental Psychology suggested that the teenage years might be a period when conspiracy theories are more likely to take hold.

ACTION STEPS:

1. **Update school curricula to more comprehensively cover critical thinking and the scientific method on topics like climate change and agriculture**
   - Openly discuss the environmental impacts of farming and fishing, as well as the advantages of plant-based foods from a scientific lens.
   - Highlight the difficulties and risks connected to animal agriculture.
   - Incorporate lessons on climate change strategies, food literacy, soil health, cooking, nutrition, and gardening.
   - Incorporate teachings about climate action movements and campaigns in politics, geography, social sciences, and sociology courses.

2. **Remove industry marketing, courses and programs connected to school curricula**
   - Remove industry education materials, sponsorship, farmed animal programs (e.g. 4H).

3. **Create dedicated school gardening education**
   - Integrate school gardening and growing into curricula. See best practice from Youth Grow, a US program that partners with local schools to develop garden-based education initiatives and Solid Rock Community School, which offers plant-based meals to students, environmental education throughout the curriculum, and veganic gardening.
   - Consult Land to Learn's SproutEd in Elementary Schools for how to bring garden-based education to elementary school students.

4. **Eliminate the stigma of plant-based foods through science-based nutrition education**
   - Disseminate nutritional information via social media, posters and emails showing plant-based sources of key nutrients such as protein, calcium, vitamin C, vitamin D and B vitamins.

5. **Replace petting zoos and zoo field trips to animal sanctuaries**
   - Sanctuary trips help reduce attendees' consumption of animal products.
   - Use Animal Sanctuaries Around the Globe map to find a sanctuary near you.
   - Use Veganic Farming Maps to find stock-free organic farms to show.

6. **Invite guest speakers with experience in niche areas that can enlighten and engage students**
   - Switch 4 Good - a nonprofit of dairy-free athletes, doctors, dietitians, and others with extensive school resources .
   - Plant-Based Health Professionals (UK) - nonprofit that provides education and advocacy on whole food plant-based nutrition, including for children.

7. **Rewild unused land on school property to create a nature reserve so that children can learn about biodiversity and watch land recover and attract wild animals.**
   - Plant native flora, and observe and track wildlife (e.g. pollinators before & after).

Educators can play a key role in proactively addressing misinformation when it comes to food by raising their schools and raising their students' awareness around the impacts of food choices, as well as engaging them to take more action directly. There are a number of actions that educators can take:

1. **Inspire and empower students by involving them in strategies to integrate more plant-based foods into their diet and why it's important:**
   - Provide students with grade-appropriate educational resources (e.g., handouts and posters) regarding the health and environmental benefits of eating plant-based.
   - Give students a list of easy plant-based swaps/changes that they can implement. If accessible (i.e., based on student age, available class time), create the list together with students, considering their current lifestyle and incorporating their suggestions.
   - Find a way to make things fun and keep students interested and engaged over time (e.g., have a Bingo card or checklist of actions students can take, have a weekly 'plant-based challenge').
   - Measure your classroom's ecological footprint with students using the classroom activities and calculator from the Earth Overshoot Day guide.
   - Use accessible AI and design exercises to understand the issues and opportunities with food and agriculture.

2. **Remove industry marketing and courses from school curricula.**

3. **Create lesson plans with activities to increase student engagement and knowledge and/or update curricula:**
   - Feature impactful science-based presentations in class, such as Educated Choices' "The Environment and Modern Agriculture" - a 44 minute video updated frequently with data from scientific organizations such as NASA, the World Resources Institute and the Center for Climate Energy Solutions.
   - Consult the rest of the wide toolkit from Educated Choices for guidance on a range of topics, including aquatic agriculture, deforestation, eco foods, greenhouse gas emissions, land usage, ocean and water pollution, fishing, water quality loss, animal waste, hunger, factory farming, antibiotic resistance and more.
   - Use the Healthy Kids Happy Planet elementary school lesson plans, which include a Plate to Planet curriculum that focuses on biodiversity and climate change through interdisciplinary lessons (designed for grade levels 3-5) that help young students understand the challenges of the food system.
   - Use the Healthy Kids Happy Planet high school lesson plans for a range of presentations that can be used in health and P.E. classes ("Food Choices for a Healthier Future"); science classes ("Meaningful Choices for a Sustainable Future")'; and psychology and Social Studies ("Values in Action: Creating Social Change").
   - Update course curricula to include a focus on food literacy and growth as well as the impact of animal agriculture.
   - Create, upload and share food and climate action modules to Teachers Pay Teachers.

4. **Petition, lobby and work with school administrators to increase plant-based foods in school food procurement and service:**
   - This lobbying can include: asking the school to adopt Greener by Default standards; liaising with plant-based health professionals and nonprofits to present to students; and collaborating with food service professionals for free training for school chefs and cooks.
   - Draft direct emails to food service providers to improve healthy school food options using our template.

5. **Integrate lessons on land use and how much we could free up if shifting to a plant-based food system:**
   - EcoCooks in Canada is an environment and plant-based cooking afterschool program for youth in grades 4-7 and a classroom-based program for youth in grades 8-12. According to their data:

6. **Attend the Educators for Animals Conference (virtual) in August:**
   - Connect with other educators and study or discuss a range of relevant topics

7. **Incorporate more growing and gardening education in class.**

8. **Become an Education Ambassador:**
   - Receive ongoing support and updates for long-term impact;
   - Connect and share best practices with other educators across the world.

9. **Add books to curriculum:**
   - e.g. "Miseducation: How Climate Change is Taught in America" (Katie Worth) https://ffacoalition.org/classroom-programming/.

Final Thoughts & Call to Action

Final Thoughts & Call to Action

We hold a hopeful view that society can successfully navigate and manage a transition to a plant-based food system, one that's better equipped to handle misinformation and disinformation. However, this will necessitate significant educational initiatives in areas like media literacy, data interpretation, and increasing social norms around understanding the principles of scientific inquiry.

Sources of pressure that could accelerate the transition may be found in new social norms and values around diet-related diseases, awareness of the environmental impacts of the food system and its contribution to the climate and biodiversity crises, and the growing "eco-anxiety" and concerns about the future among young generations. Destabilizing events from ecological collapse - including a warmer planet with more extreme weather events, the consequences of mass extinction events, and zoonotic diseases and pandemics - will only increase the urgency for food changes to plant-based and animal-free systems. While there may be livelihood disruptions in attempting to proactively get there in the short-term, these impacts will be minimal in comparison to the major societal disruption from these fully realized crises.

Policymakers and financial backers must champion both research and public engagement efforts, with a particular focus on underserved and under-resourced communities to ensure a just and accessible transition.

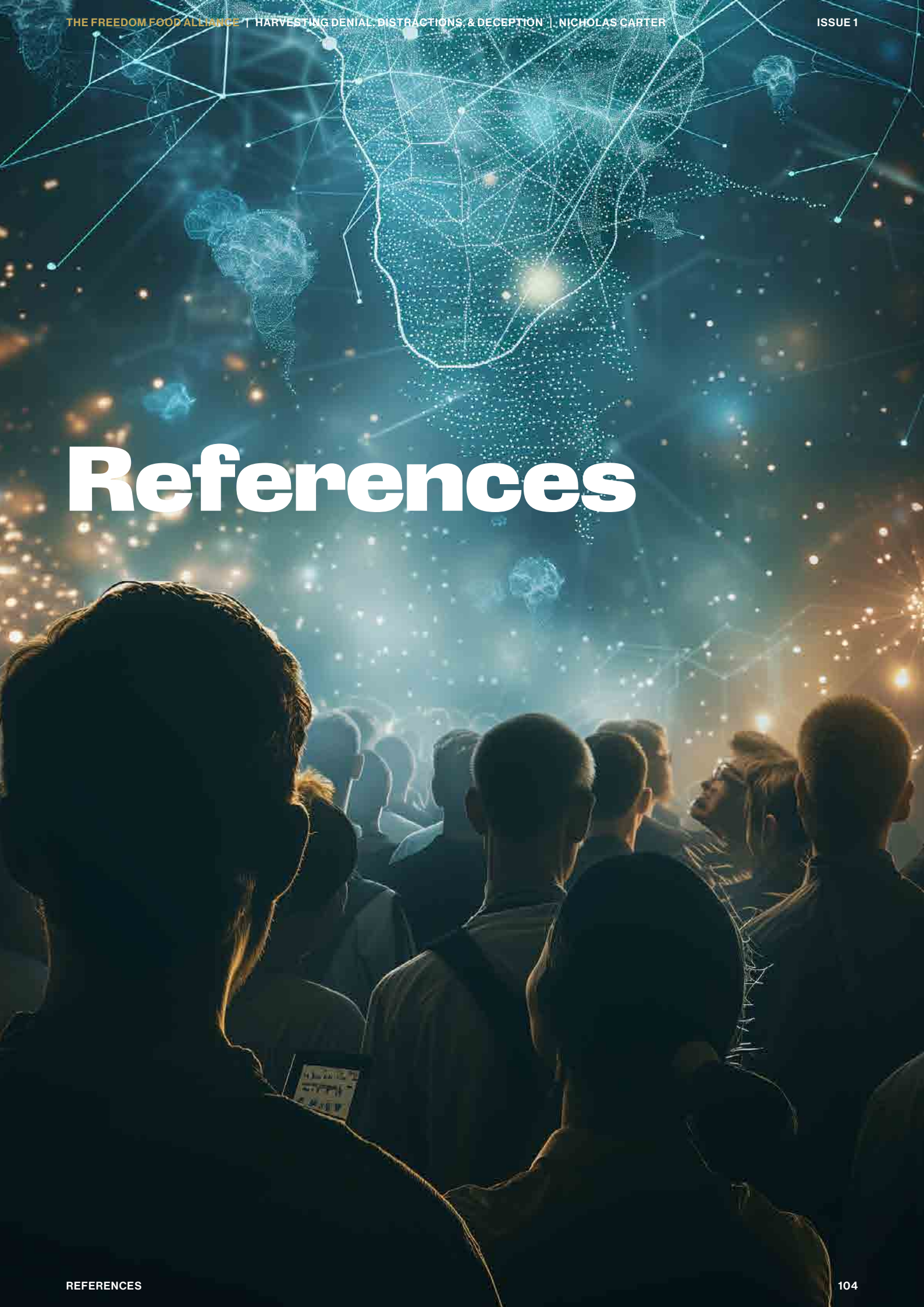
There are several areas whereby the strategies of the animal agriculture industry exhibit weaknesses:

- Employees and the labor force, much like in other industries, are often subject to exploitation within animal agriculture, as the biggest producer of meat, JBS, is now facing as they prepare for a United States' IPO despite demands for transparency in their supply chain impacts. This can lead to protests, whistleblowing, or vocal dissent regarding their employers' initiatives. Experts might also align against their own industry to unveil practices.
- Funders are demanding accountability, prompting shareholders to withdraw their support. In some cases, executives are coming forward to expose their own companies.
- Student groups are speaking out that universities should refuse animal agriculture research money, divest from it and offer plant-based as a default instead. Indeed, such instances have occurred in other industries, like New York University divesting from fossil fuels, often paving the way for transformative change.
- Technology is being deployed to better monitor and hold polluters accountable, avoiding the need to rely on their self-reporting downplaying tactics.

Above all, it's crucial to remember that public trust is the bedrock of scientific endeavors, funding, and its real-world applications. Science-related misinformation has the potential to erode this trust. We must prevent such a situation at all costs while continuing to put pressure on those most responsible for normalizing environmental destruction.

This report has dissected the strategies employed by the animal agriculture industry to spread disinformation, revealing the alarming extent to which these tactics have permeated our society. The initial awareness is only the first step towards change. It is crucial that we take action to address this misinformation and its potentially devastating consequences on our environment, health, and food security.

The solutions outlined in this report, from utilizing AI and satellite tracking to holding the industry legally accountable for downplaying its impacts, provide a brief roadmap for change. But this is just the beginning. We must engage in a collective effort to demand transparency, regulation, and transformational, yet just, changes away from the animal agriculture industry. It is our responsibility to champion truth, advocate for inclusive well-being for our planet, ourselves, and future generations. Let this report serve as a start to a catalyst for action and a call to systemically address disinformation from animal agriculture. Together, we can create a world where truth prevails and where the health of our planet and its inhabitants is safeguarded.



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Further Reading

Animal Agriculture Misinformation and Disinformation

- "Cowgate" Meat eating and climate change denial - Vasile Stanescu
- Manufacturing ignorance: think tanks, climate change and the animal-based diet
- The Playbook - Dr. Jennifer Jacquet
- Big Livestock's Big Green Wash

General

- University of Washington - Confronting Fake News and Misinformation
- Stanford University - Science Education in an Age of Misinformation
- Misinformation in and about science - PNAS Research Article (2021)
- Inoculating the Public against Misinformation about Climate Change - How people evaluate and process consensus cues in a polarized information environment - Global Challenges article (2017)
- Agnotology: The Making and Unmaking of Ignorance is a 2008 collection of essays that explore the concept of agnotology, a term coined by Robert N. Proctor to describe the study of culturally induced ignorance or doubt, particularly the publication of inaccurate or misleading scientific data. The term has a broader application in highlighting the use of strategic ignorance, either in the form of neglect, forgetfulness, secrecy, or selective choice of facts. In this work, Proctor, a historian of science, collaborates with Londa Schiebinger, a gender studies scholar, to assemble diverse perspectives exploring the ways ignorance is produced or maintained in society. They investigate how ignorance is actively created and sustained by various mechanisms including media control, secret-keeping, information suppression, and more.
- Science and the Production of Ignorance: When the Quest for Knowledge Is Thwarted (2020). An introduction to the new area of ignorance studies that examines how science produces ignorance—both actively and passively, intentionally and unintentionally. We may think of science as our foremost producer of knowledge, but for the past decade, science has also been studied as an important source of ignorance. The historian of science Robert Proctor has coined the term agnotology to refer to the study of ignorance, and much of the ignorance studied in this new area is produced by science. Whether an active or passive construct, intended or unintended, this ignorance is, in Proctor's words, "made, maintained, and manipulated" by science. This volume examines forms of scientific ignorance and their consequences. A dialogue between Proctor and Peter Galison offers historical context, presenting the concerns and motivations of pioneers in the field. Essays by leading historians and philosophers of science examine the active construction of ignorance by biased design and interpretation of experiments and empirical studies, as seen in the "false advertising" by climate change deniers; the "virtuous" construction of ignorance—for example, by curtailing research on race- and gender-related cognitive differences; and ignorance as the unintended by-product of choices made in the research process, when rules, incentives, and methods encourage an emphasis on the beneficial and commercial effects of industrial chemicals, and when certain concepts and even certain groups' interests are inaccessible in a given conceptual framework.
- Psychologists are taking aim at misinformation with these powerful strategies
- The Merchants of Doubt - specific mostly to global warming and tobacco, but relevance to animal agriculture
- Oxford University's report: The Global Disinformation Order: 2019 Global Inventory of Organised Social Media Manipulation
- Michael Golebiewski and Danah Boyd's concept of Data Voids: Where Missing Data Can Easily Be Exploited
- Harvard's case study on How the Chinese Government Fabricates Social Media Posts for Strategic Distraction, not Engaged Argument, which provides a fascinating look at one way that disinformation can be used
- BBC's research on differing worldwide responses to, and contexts for, misinformation in India, Kenya, Nigeria
- Christoph Koettl's Citizen Media Research and Verification: An Analytical Framework for Human Rights Practitioners, which brings up interesting case studies for the importance of verifying "citizen media" as well as strategies for doing so.
- Tools that fight disinformation online

Moodie, A. R. (2017). What public health practitioners need to know about unhealthy industry tactics. American journal of public health, 107(7), 1047-1049.

Undermining Legitimate Science:

- Discredit science as deceptive, labeling it as "junk" or "bad," alleging manipulation for political motives.
- Target scientific institutions and government agencies perceived as contrary to corporate interests.
- Emphasize uncertainty by claiming ignorance of causes, withholding unfavorable data, and using misleading information.
- Highlight multiple causes for health or environmental issues to downplay the impact of addressing one.
- Exaggerate inherent uncertainty in scientific endeavors to challenge established knowledge.
- Utilize studies funded by corporations, supporting researchers sympathetic to corporate causes.

Attacking and Intimidating Scientists:

- Cast doubt on authors' authenticity and integrity.
- Challenge messengers' credibility, alleging ulterior motives.
- Intimidate opponents through "attack dogs" and smear campaigns.
- Employ rhetoric associating environmentalists with negative terms.
- Threaten or initiate legal action against scientists and advocates to avoid or delay hearings.
- Infiltrate scientific groups, monitor prominent scientists, and create doubt to impede litigation and regulation.
- Employ pejorative terms like "excessive regulation" to foster fear and disdain, demanding constant proof.

Establishing Arms-Length Front Organizations:

- Create front groups to run projects, using law firms to evade scrutiny with attorney–client privilege.
- Establish research institutes for independent studies, sponsoring conferences and workshops.
- Develop "independent" publications not subject to peer review, selectively publishing findings.
- Manipulate research funding, design, and authorship.
- Distribute materials through targeted pamphlets, booklets, and social media.
- Leverage public opinion polling.

Manufacturing False Debate and Insisting on Balance:

- Create an illusion of controversy to maintain debate and false dichotomies.
- Insist on equal coverage for both sides in the media, demanding balance.
- Divert attention from harmful products by focusing on corporate social responsibility and other unrelated issues.

Framing Key Issues Creatively:

- Present problems as highly complex, implying a lack of simple solutions.
- Assert the premature nature of suggested remedies.
- Emphasize technological advances, advocating for marketplace solutions.
- Insist on personal or parental responsibility, minimizing the role of government in health behaviors.

- Use colorful imagery and language to frame issues in a way that supports a specific narrative.
- Utilize fear as a tool for policy change.
- Downplay the severity of problems while conceding some ground.

Funding Industry Disinformation Campaigns:

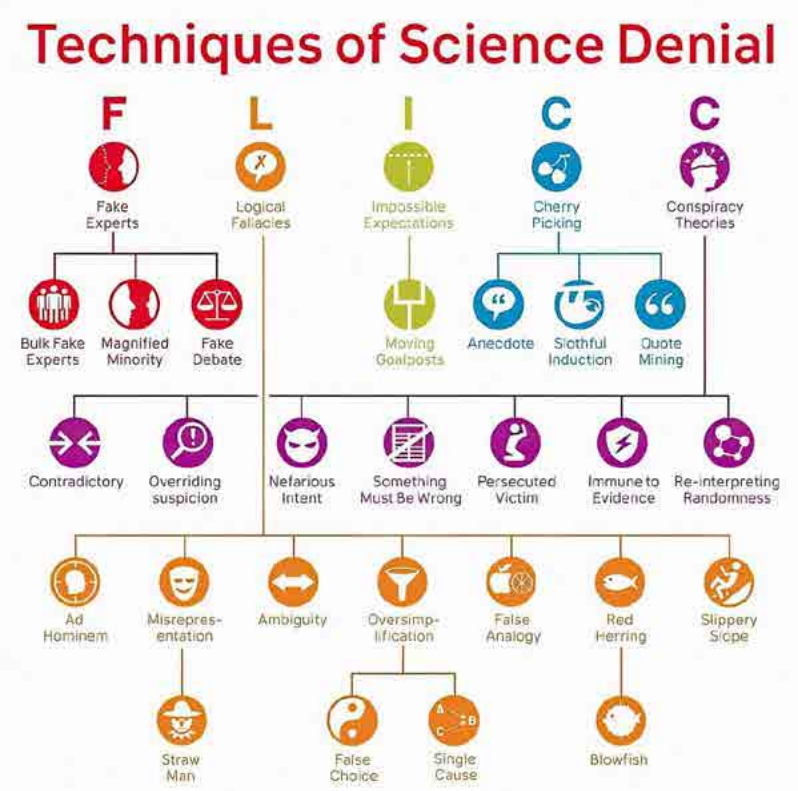
- Run disinformation campaigns employing various creative forms.
- Pay and co-opt celebrities and sympathetic expert witnesses.
- Sponsor conferences challenging scientific consensus.
- Align with other issues such as employment discrimination and antitax groups.

Influencing the Political Agenda:

- Donate to political parties across the spectrum.
- Include representatives from unhealthy industries in policy discussions and guideline development.
- Invest heavily in paid lobbyists.
- Establish relationships with influential government figures through targeted hiring of politicians and advisers.
- Aim to reduce government budgets for activities against corporate interests.

Game

- Bad News is a free-to-play online browser game in which players take the perspective of a fake news tycoon. It was released on February 19, 2018. The game is aimed at improving media literacy and social impact.



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