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U.S. JUST FOOD TRANSITION ROADMAP

Understanding the U.S. Food System to Catalyze Change

Contents

Acknowledgments

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The full roadmap and resources are available at JustFoodTransitionNetwork.com/us-roadmap.

Introduction: The political, social, and cultural contexts of the U.S. food system and the role of industrial animal production

The *U.S. Just Food Transition Roadmap* envisions a U.S. food system that prioritizes sustainable, nutrient-dense food production with greater dependence on and support for whole and minimally-processed plant foods at all levels; provides everyone access to adequate nutritious, affordable, and culturally appropriate foods; supports fair prices for farmers; adheres to strong sustainability and worker protection standards; strengthens food sovereignty; and significantly reduces the number of animals killed and wild habitats destroyed for food.

Achieving a just food transition will require policy shifts and other government actions that remove barriers to food system transformation and dismantle corporate control of the food system. At the same time governments need to create a policy landscape that supports locally and democratically owned models, empowered workers, food sovereignty, animal welfare, and environmentally sustainable production and consumption. Specific policy examples can be found in the supplemental *U.S. Just Food Transition Roadmap: Policy Pathways* document.

The following document provides crucial context for understanding the unique combination of factors that define the current U.S. food system, the dominant role of industrial animal production (including feed crops), and the challenges and opportunities for transformation.

Abbreviations

AMS: Agricultural Marketing Service, under USDA

APHIS: Animal and Plant Health Inspection Service, under USDA

CAFOs: Concentrated Animal Feeding Operations (CAFOs) are regulatorily defined agricultural operations in the United States that raise land animals for food in confined quarters, normally without access to the outdoors or vegetation. The U.S. government defines whether a CAFO qualifies as large, medium, or small depending on the specific number of animals confined, on a species-to-species basis. For example, large CAFOs house at least 1,000 cows, 2,500 pigs, and 125,000 broiler chickens, while small CAFOs house fewer than 300 cows, 750 pigs, and 37,500 broiler chickens.[1]

CDC: Centers for Disease Control and Prevention, under HHS

DGA: Dietary Guidelines for Americans

EPA: The United States Environmental Protection Agency (EPA) was established in 1970 by President Nixon with the approval of Congress. Its mission is to protect human health and the environment — ensuring clean air, land, and water — by developing and enforcing regulations, giving grants, studying environmental issues, working with partners, and providing information.[2]

FDA: Food and Drug Administration, under HHS

FNS: Food and Nutrition Service, under USDA

FSA: Farm Service Agency, under USDA

HHS: United States Department of Health and Human Services

NRCS: Natural Resources Conservation Service, under USDA

NSLP: National School Lunch Program

OSHA: Occupational Safety and Health Administration, under U.S. Department of Labor

SBP: School Breakfast Program

USDA: United States Department of Agriculture

Overview of the U.S. food system

Farmland Ownership and Land Use

Farmland ownership patterns in the United States reflect a history of inequity and increasing corporate control over agricultural land. Approximately 40% of U.S. farmland is rented rather than owned by producers.[3]

Nearly 30% of agricultural land is owned by landlords who have no direct involvement in farming, and institutional investors have increasingly viewed farmland as a profitable asset class, driving up land prices and reducing access for small and beginning farmers. In 2019 alone over $10 billion worth of farmland was under institutional management.[4]

A growing portion of this land is controlled by nonfarming landlords, including investment firms, pension funds, and absentee owners who prioritize financial returns over agricultural stewardship.[5] This trend has exacerbated the displacement of smallholder farmers and Indigenous communities, historically dispossessed through discriminatory policies and violence.[6]

Concentrated land ownership not only limits opportunities for equitable land access but also concentrates political and economic power in the hands of a few, undermining the resilience and sustainability of rural economies.[7]

Despite research highlighting the risks of land consolidation, including reduced rural economic resilience and greater barriers to land access for beginning and marginalized farmers,[8] federal policy has largely perpetuated these problems rather than supported a transition toward more equitable land distribution.

Land use patterns within the U.S. agricultural sector are heavily skewed toward producing commodity crops such as corn and soybeans, which account for over 50% of harvested cropland.[9] For context, specialty crops (fruits, vegetables, and other locally consumed foods) receive far less acreage and support.

According to USDA data, nearly 90 million acres were planted with corn and over 86 million acres with soybeans in 2022 alone.[10] These crops are mainly utilized for animal feed, biofuel production, and processed food ingredients, with only a small fraction going directly to human consumption.[11] This emphasis reinforces an industrial agricultural model that prioritizes volume and marketability over ecological sustainability and community nutrition. The resulting monocultures degrade soil health, reduce biodiversity, and increase reliance on chemical inputs such as synthetic fertilizers and pesticides, with U.S. farmland losing an estimated 24 billion tons of topsoil annually.[12]

Simultaneously, this system undermines local food sovereignty by prioritizing global commodity markets over regional food needs. In contrast, agroecological systems (diverse polycultures, cover cropping, etc.) have shown clear benefits.

For example, after Hurricane Ike in 2008, diversified farms suffered only ~50% crop loss vs. 90–100% losses on nearby monocultures.[13] Agroecology restored topsoil, improved yields, and enhanced resilience in many studies. However, entrenched subsidies, insurance programs, and powerful agribusiness lobbies continue to favor large-scale commodity production over these alternatives.[14]

Farmer Data and Demographics

The demographic makeup of American farmers reveals both an aging workforce and significant racial disparities. The average age of a U.S. farmer is currently 58 years, a figure that has steadily increased over the

past three decades, signaling a generational crisis in agriculture.[15]

More than 95% of all farmland owners are white, with Black farmers owning less than 1% of U.S. farmland despite historically constituting over 14% of the farming population in the early 20th century.[16]

These trends arise from a long history of systemic exclusion faced by Black, Indigenous, and other people of color in terms of land ownership, access to affordable credit, technical assistance, and participation in federal support programs. For example, discriminatory practices by the USDA throughout the 20th century severely limited such farmers' access to vital farm loans and disaster relief programs.[17]

Structural barriers remain prevalent today, including discriminatory lending practices by private financial institutions, a lack of meaningful protections for heirs' property, and inequitable distributions of farm subsidies that overwhelmingly favor large, white-owned operations.[18]

Despite the growing number of new farmers seeking to enter agriculture, many face formidable barriers such as skyrocketing land prices, which have increased by over 30% since 2020 alone, substantial debt burdens, and ongoing systemic racism.[19] These challenges create a food system that undermines economic justice, equity, food sovereignty, and resilience to future socio-economic and environmental crises.

Contract Growers

The U.S. agriculture system is unique in its widespread use of contracts between large agribusinesses (contractors) and farmers to produce commodities. In 2020 agricultural contracts accounted for about 33% of total commodity production and 46% of all livestock production.[20]

The two main types of contracts are marketing contracts and production contracts. Under a marketing contract, the farmer owns the commodity during production and provides all the inputs, while the contractor determines pricing, quantity, quality, and delivery terms. Under a production contract — more common among livestock growers — the contractor owns the commodity, often provides specific inputs and protocols, and pays the farmer a fee for raising the animals.[21] Production contracts represented 76% of poultry and egg production and 74% of hog production in 2020.[22]

Contracting can be risky and exploitative for farmers. Many livestock contracts require farmers to construct new barns or buy equipment, often putting them into millions of dollars of debt with no guaranteed return.[23]

Moreover, quality standards are set by the contractor, who retains discretion to reject or downgrade the product. If the animals die due to disease, heat, or equipment failure, the farmer may owe the contractor for the loss.[24] Some contractors implement "tournament systems," ranking growers against one another to determine payment, even if performance differences are due to factors beyond the farmer's control.[25]

Many contract growers describe an oppressive culture of fear: speaking out about safety concerns or corporate misconduct can lead to contract termination, financial ruin, or blacklisting within the industry.[26] The system leaves little recourse, creating a power imbalance that consolidates control in the hands of a few vertically integrated corporations.

Environmental Pollution and Industrial Agriculture

Agricultural pollution remains a major source of environmental degradation in the United States. Nutrient runoff rich in nitrogen and phosphorus has led to hypoxic "dead zones" in bodies of water such as the Gulf of Mexico, which measured over 3,058 square miles in 2023.[27]

Fertilizer runoff alone accounts for roughly 40% of nitrogen pollution in U.S. waterways.[28] Monoculture farming

systems — particularly corn and soy — rely heavily on pesticides and synthetic fertilizers, which disrupt microbial soil communities and have contributed to the loss of native pollinator populations.[29]

Over 1 billion pounds of pesticides are applied annually in U.S. agriculture, with approximately 85% of that used on commodity crops.[30] A 2018 report found that an estimated 235 million pounds of herbicides and insecticides were applied to feed crops grown for animals on factory farms.[31]

These chemical loads carry serious public health consequences, including increased risks of cancer and hormone disruption, particularly among farmworkers and nearby rural communities.[32]

Concentrated Animal Feeding Operations (CAFOs) worsen the issue by generating an estimated 335 million tons of animal waste annually.[33] This waste often leaks from lagoons or is overapplied to fields, contaminating local groundwater and surface water supplies.[34]

Studies have shown that communities near dense clusters of CAFOs face higher rates of waterborne illness and respiratory diseases linked to ammonia, hydrogen sulfide, and particulate matter emitted from animal waste.[35]

Importantly, air pollution from food production — especially from animal agriculture — has been linked to premature deaths. A recent study found that the livestock industry's air pollution is responsible for more than 12,700 deaths per year.[36]

Despite these dangers, regulatory oversight remains weak. Industry lobbying, political pressure, and legal loopholes have all contributed to minimal enforcement and accountability.[37] For example, "right-to-farm" laws, which have been enacted in all 50 states, protect farms from legal and regulatory actions holding them responsible for harms they cause to surrounding areas, allowing them to get away with more pollution.[38] While in certain cases these laws may help small farmers by protecting them from "nuisance" lawsuits, right-to-farm laws should not apply to large operations, industrial operations, or CAFOs.

Labor Conditions and Workers' Rights

Workers throughout the U.S. food system — from farms to processing plants — face widespread exploitation and systemic neglect. Approximately 2.4 million farmworkers labor in U.S. agriculture, and nearly 50% lack legal work authorization.[39] Around 83% are Latino, and nearly one-third live below the poverty line.[40] Despite being classified as "essential" during the COVID-19 pandemic, many food system workers remain excluded from foundational labor protections.

Agricultural workers are not covered by the National Labor Relations Act and are often excluded from the Fair Labor Standards Act, meaning they are denied the legal right to unionize, receive overtime pay, or, in some cases, earn minimum wage.[41]

The physical conditions of farm work are hazardous: agricultural workers are 35 times more likely to die from heat-related causes than workers in other industries.[42] Pesticide exposure is another serious risk, with thousands of acute poisoning cases reported each year.[43]

Wage theft is rampant. A 2023 Economic Policy Institute analysis found that federal investigations uncovered violations at 70% of the farms they examined, most commonly for unpaid overtime and minimum wage violations.[44]

Employer-provided healthcare is rare — only 29% of farmworkers reported receiving health insurance through their employer, and fewer than 50% had any coverage at all.[45]

This disregard for the health and safety of the people on the front lines of food production is particularly stark during times of crisis. During the COVID-19 pandemic, farmworkers and food processing workers weren't provided with basic protections, such as personal protective equipment or sick days. Meaningful labor protections and safety reforms were consistently blocked by agribusiness lobbying efforts and weak political will.[46]

Meat and poultry processing facilities became COVID hotspots, with an estimated 236,000 to 310,000 positive cases and 4,300 to 5,200 deaths associated with meat and poultry processing plants in the first few months of the pandemic alone.[47] Meatpacking plant workers experienced infection rates up to four times higher than those of the general population.[48]

Despite the devastating spread of the virus through meatpacking plants, President Trump issued an executive order to keep those plants open, often against the advice of local health officials. That executive order was linked to a proposal drafted by the meat companies themselves.[49]

Retaliation against workers who report unsafe conditions or labor violations is common, disincentivizing already vulnerable workers from reporting.[50] A 2024 investigation found that California's main worker safety agency had yet to return to pre-pandemic levels of inspection, even as extreme heat and abuse continued.[51]

Without robust enforcement and structural reform, labor exploitation remains deeply embedded in the food system. Strengthening workers' human rights to organize a union and bargain collectively is critical to empowering workers to protect themselves and improve labor conditions throughout the food chain.

Food Insecurity

Food insecurity remains a deeply entrenched issue in the U.S. food system. In 2023 approximately 44 million Americans — including 13 million children — lived in food-insecure households, meaning they lacked consistent access to enough food for an active, healthy life.[52] Rates of food insecurity are disproportionately high among Black and Hispanic households, which experience hunger at nearly double the rate of white households.[53]

Rural communities are especially vulnerable. In several counties — particularly across the South, Midwest, and Alaska — child food insecurity rates exceed 50%.[54] The COVID-19 pandemic intensified these disparities, causing spikes in hunger that persist despite broader economic recovery efforts.

The underlying causes of food insecurity are multifaceted: stagnant wages, high housing costs, limited access to affordable healthcare, and systemic inequities in food access all contribute to the problem.[55] Programs like the Supplemental Nutrition Assistance Program (SNAP), the Women, Infants, and Children (WIC) program, and school meal services provide critical support but face funding gaps, eligibility restrictions, and political pushback.

Meanwhile market consolidation has reduced grocery access in many low-income and rural communities. The top four grocery retailers now control 69% of the market, limiting food availability in underserved areas and concentrating power in food retail.[56]

Addressing food insecurity requires a systemic approach: strengthening safety net programs, improving access to healthy, affordable foods, and ensuring that the food system supports — not excludes — those most in need.

Interest Groups

The political landscape of U.S. agriculture is shaped by a small number of powerful industry groups, including, but not limited to, the American Farm Bureau Federation, CropLife America, and the National Cattlemen's Beef Association. These organizations exercise significant influence over policy at both the state and federal levels, often through extensive lobbying, legal action, and campaign contributions.[57]

In 2022 agribusiness lobbying expenditures totaled over $158 million, with the Farm Bureau and livestock associations among the top spenders.[58] These groups advocate for policies that benefit large-scale, industrial agriculture at the expense of small farmers, rural communities, labor rights, public health, and environmental sustainability.

For example, the American Farm Bureau Federation has consistently opposed stricter environmental regulations under the Clean Water Act and resisted efforts to extend labor protections to farmworkers.[59] [60] CropLife America, which represents pesticide manufacturers, has lobbied aggressively against tighter regulations on agricultural chemicals, despite mounting evidence of their negative ecological and public health impacts.[61]

The National Cattlemen's Beef Association has worked to block climate change mitigation efforts targeting methane emissions from livestock.[62] Through these lobbying campaigns and policy maneuvers, industry groups have shaped Farm Bills, blocked animal welfare legislation, and undermined democratic food system alternatives such as agroecology, regional food hubs, and farmer cooperatives.[63]

The result is a policy environment that favors corporate agribusiness and commodity production over public interest and long-term sustainability. Challenging this dominance is essential to building a food system rooted in equity, resilience, and justice.

Animal Welfare

Industrial animal agriculture in the United States subjects more than 9 billion land animals each year to extreme confinement, painful mutilations, and the denial of natural behaviors.[64] Over 99% of farmed animals — including chickens, pigs, and cattle — are raised in Concentrated Animal Feeding Operations (CAFOs), where space is limited, and conditions are often unsanitary.[65]

For example, chickens raised for meat may live with less space than a sheet of paper per bird, while more than 60% of breeding sows in the U.S. are confined to gestation crates so small they cannot turn around.[66]

While some states have passed legislation to improve welfare standards — such as California's Proposition 12, which sets minimum space requirements for veal calves, pregnant pigs, and egg-laying hens — these laws have faced fierce opposition from industry groups.[67] Legal challenges, including those based on the dormant Commerce Clause, have sought to overturn or weaken state-level animal protection laws.[68]

At the federal level, protections for farmed animals are extremely limited. The Animal Welfare Act (AWA), the main federal law regulating animal care, explicitly excludes animals raised for food, including poultry and livestock.[69] As a result, more than 95% of animals in agriculture receive no federal welfare protections during their lives on the farm. Federal humane-treatment inspections largely occur at slaughter facilities, while animals raised in CAFOs are not subject to routine on-farm welfare inspections by the USDA.[70]

Poor animal welfare conditions also pose public health risks. Overcrowding, poor ventilation, and chronic stress contribute to the spread of disease. The emergence of zoonotic viruses, including avian flu and swine flu, has been linked to intensive animal farming practices.[71] The overuse of antibiotics — about 70% of antibiotics sold in the United States are given to animals, not people — contributes to more antibiotic-resistant bacteria, threatening public health.[72]

Despite growing public concern, reform efforts remain stalled due to lobbying by powerful animal agriculture

interest groups, as well as legal and regulatory systems that favor industry over transparency and accountability.[73]

The U.S. Policy Landscape

The U.S. food and agriculture system is shaped by a complex web of policies, enacted over time by a panoply of legislative and judicial actions and implemented and enforced by dozens of federal agencies and state and municipal governments.

While the Farm Bill underpins the majority of food and agriculture funding at the federal level, the food system is also greatly affected by environmental regulations, nutrition assistance programs, administrative rules, and state and local laws. These in turn interact with a vast range of specific and overlapping issues, including workers' rights, whistleblower protections, pollution, school food, government procurement, antitrust and corporate competition, animal welfare, food insecurity, sustainability, and consumer protection.

But a slew of conservative legal and administrative actions in recent years are greatly changing the way the system has traditionally operated, making it harder for agencies — particularly career agency staff — to enforce the law in a way that provides the level of oversight necessary to protect food safety, workers, animal welfare, and the environment.

While the agriculture industry has always benefited from a close relationship with the government, often referred to as "agricultural exceptionalism," pro-corporate agricultural interests are increasingly exerting influence and diminishing the power of government oversight, to the detriment of the majority of the American public.

The Supreme Court of the United States has recently confirmed a number of precedent-upending decisions that weaken the ability of government agencies to protect the environment from agribusiness pollution. The Trump administration has mass-fired critical USDA,[74] EPA,[75] and HHS (including CDC and FDA)[76] employees and gutted programs meant to help local farmers,[77] make food more accessible,[78] and invest in sustainable agriculture.[79]

This section examines a few of the biggest influences on U.S. food policy. It is not intended to be comprehensive in representing all of the significant factors that define the U.S. food system or opportunities for transformation.

Farm Bill

The Farm Bill is an omnibus law, typically passed every five years by Congress, that governs and funds the nation's major food and agriculture programs. The bulk of mandatory spending goes to programs related to nutrition (SNAP), crop insurance, farm commodities, and conservation.[80]

Direct and indirect subsidies dictated by the Farm Bill have created a paradigm that favors industrial production and corporate consolidation while discouraging a transition to more equitable and sustainable agriculture. One example of how industrial animal agribusinesses have benefited from the Farm Bill for decades was the 1996 provision that eliminated most of the remaining supply-management measures for feed crops. Overproduction of corn and soy soared while prices plummeted. Giant meat and dairy companies raked in profits producing cheap meat, dairy, and eggs on low-cost feed while independent family farmers struggled to make ends meet.

It's estimated that this one policy created a $35 billion indirect subsidy for industrial animal producers over a nine-year period.[81]

The last Farm Bill's baseline projection of mandatory outlays for the ten-year period from FY 2025 through FY 2034 amounts to $1.364 billion.[82] The Farm Bill was supposed to be reauthorized in 2023, but due a failure of consensus, Congress instead enacted two one-year extensions of the 2018 Farm Bill through FY 2025.[83]

The Farm Bill has long been criticized for being too sprawling and increasingly bloated because its mandatory passage allows many different provisions and riders to be added in by groups with differing agendas. The 2018 Farm Bill is 529 pages long and composed of 12 massive titles, the 12th of which is just a collection of 85 "miscellaneous" provisions related to everything from exemptions to certain echinoderm exports to absent landlords to broadband access.[84]

A major bloat is the immense subsidization of industry that often disproportionately aids large industrial producers — particularly animal agriculture — and harms smaller independent farmers and specialty crop producers. While 30% of U.S. farm subsidies go to livestock feed, just 4% is directed to growing fruits and vegetables.[85]

U.S. Department of Agriculture

The U.S. Department of Agriculture (USDA) was established by President Lincoln in 1862 to benefit and regulate the nation's food and agriculture system. Divided into 29 agencies and offices, it is one of the largest federal agencies, with an annual budget of about $230 billion.[86]

Some offices focus on oversight of agricultural activities, direct farmer support, animal and plant health including the spread of zoonotic diseases, and conservation programs, while others regulate trade and some animal-welfare issues. Other offices focus on food safety and nutritional health, such as the Supplemental Nutrition Assistance Program (SNAP) and the National School Lunch Program (NSLP).

USDA's Food Safety and Inspection Service (FSIS) is responsible for food safety and labeling, monitoring food quality and foodborne illnesses, and enforcing humane slaughter and handling laws. The FDA, which is under the Department of Health and Human Services, is responsible for all other food inspections and labeling compliance, including dairy, shell eggs, and most seafood.

Because the USDA is so massive and oversees such a wide range of issues, some of its programs create potential conflicts of interest. For example, the promotion and subsidization of commodity crops and animal agriculture above fruits and vegetables conflicts with the Department's mission to ensure the availability and accessibility of nutritious food for all Americans.

Similarly, the propping up of the meat, dairy, and egg industries — and consequent loosening of regulatory oversight — leads to more instances of foodborne illnesses, pollution and habitat destruction, animal cruelty, and worker injuries. And while programs to improve agricultural marketing and trade are meant to help boost the domestic agricultural economy, they tend to overwhelmingly benefit the largest corporations at the expense of small farmers.

The Role of the Dietary Guidelines for Americans in a Just Transition

The Dietary Guidelines for Americans (DGA) is published every five years by the Department of Health and Human Services (HHS) and USDA. It's historically based on recommendations from an advisory committee of the nation's foremost health and nutrition experts following an extensive review of the latest nutrition science. However, the Trump administration ignored the committee's report in favor of its own industry-friendly scientific review that resulted in the 2025-2030 DGA emphasizing meat- and dairy-heavy recommendations.[87]

The guidelines have an enormous influence on national nutrition policy by setting recommendations for daily dietary intakes of different food groups. Federal agencies must align their food, nutrition, and health programs and food service facilities with the guidelines, and state and local governments, health and nutrition organizations, and U.S. healthcare providers often use them as a model for nutrition guidance. As a result the guidelines play an important role in which producers are supported by government and institutional purchasing and which foods are widely available, especially to the most vulnerable populations.

The federal government spends more than $40 billion annually on major food and nutrition assistance programs that are explicitly required by law to follow the dietary guidelines[88] and which serve 1 in 4 Americans.[89]

The United Nations has identified national food-based dietary guidelines as an important tool for addressing food-based emissions and public health,[90] but the United States currently lags behind comparable countries in this area. Nearly 80% of G20 nations have published dietary guidelines that discuss the impacts of diet on sustainability or the environment, with over 70% calling for lowered meat consumption as a result — yet the United States is not one of them.[91]

In January 2026 the Center for Biological Diversity and Center for Science in the Public Interest released *The Uncompromised Dietary Guidelines for Americans*, which shows what the guidelines should have looked like had they followed the advisory committee's recommendations that prioritized beans, peas, and lentils while reducing red and processed meats,[92] along with *A Model for Healthy and Sustainable Dietary Guidelines for Americans*, which demonstrates why and how sustainability should be integrated into the DGA.

Corporate Power and Regulatory Capture

Federal food and agriculture policy in the United States has experienced a long tradition of regulatory capture, in which private industry interest groups effectively control and profit from many legislative and agency decisions and actions. Corporate agribusinesses and their interest groups spend tens of millions of dollars per year on lobbying and election campaigns to maintain that preferential treatment.[93]

For instance, between 2019 and 2023 alone, it spent over half a billion dollars to influence the Farm Bill.[94] The secretary of Agriculture, who leads USDA, is often a former lobbyist or titan of the agriculture industry.[95] Over the agency's history, such lobbying has paid off tremendously, resulting in the government shelling out billions of taxpayer dollars per year in subsidies, corporate bailouts, contracts, and grants to industrial producers,[96] while loosening regulatory oversight and crafting nutrition narratives that are favorable to industry.[97]

Giant corporations overwhelmingly benefit, as they are the ones who can afford to lobby, which is evidenced by the fact that just the top 10% of recipients received 79% of total commodity payments from 1995 to 2023.[98]

Mega-conglomerates have been buying up smaller farms at astonishing rates; in 2022 fewer than 1% of U.S. farms produced 42% of sales[99] and 2% of farms controlled 42% of all farmland.[100]

Industrial animal agriculture in particular receives a far larger share of the pot than other sectors. USDA keeps the dairy industry afloat by accounting for 73% of its total revenue,[101] disproportionately insuring crops that feed livestock,[102] bailing out companies for animals lost to disaster,[103] and funding programs under the often-misleading justification of "mitigating" animal agriculture's immense negative impact on the environment.[104]

Meanwhile the four largest meat companies control 82% of the American beef market, 66% of the pork market, and 54% of the poultry market.[105] Ninety-nine percent of all livestock and poultry in the United States are raised on CAFOs, with the total number having doubled over the past two decades.[106]

Clean Water and Air Acts

Landmark environmental laws like the Clean Water Act and Clean Air Act have long made it possible for the EPA and states to regulate and remediate industrial pollution, but a history of exemptions and loopholes for animal operations has resulted in lax enforcement and severe harms to the health of U.S. waterways,[107] air quality,[108] and rural communities[109] from feed crop monocultures and associated pesticide use, CAFOs, feedlots, and slaughterhouses.

However, a slew of recent decisions by the U.S. Supreme Court has continuously diminished the EPA's ability to carry out the intended purpose of these laws, giving the animal agriculture industry freer rein to pollute the nation without consequence.

The Clean Water Act (CWA) is the primary law regulating water pollution and quality in U.S. waterways. Under this statute, EPA (and in some cases state authorities through a system of cooperative federalism) is tasked with setting and enforcing water-quality and effluent standards for industries and issuing or denying permits to control the discharge of pollution from "point sources" into U.S. waters.[110]

Concentrated animal feeding operations (CAFOs)[111] are the only industrial source that is explicitly identified in the CWA's definition of "point source."[112] Such inclusion reflects Congress' decision to expressly identify CAFOs as a concerning and growing source of pollution to waterways that must be addressed to achieve the objectives of the law. Different states have more or less stringent regulations than the federal statute.[113]

EPA has nevertheless struggled to maintain adequate oversight over this industry, leading to a decision by the 5th Circuit Court of Appeals in 2011 that found the EPA lacked authority to require CAFOs that propose to discharge to apply for a CWA National Pollutant Discharge Elimination System (NPDES) permit because the CWA regulated only actual discharges and not future discharges, even if they are imminent.[114]

As a result of this ruling and the chilling effect it had on EPA's regulatory momentum, in 2023, just 29% of CAFOs had NPDES permits,[115] despite EPA's estimates that 75% of CAFOs discharge.[116] The EPA itself has admitted that many CAFOs "continue to discharge without NPDES permits" because of limitations to the agency's regulations.[117]

Still, the agency has failed to consistently update its CWA regulations for CAFOs except when compelled by legal action, and has denied petitions to reform them.[118] EPA also has not required permitted CAFOs to representatively monitor their pollution to demonstrate compliance with effluent limitations, and it has unduly expanded the definition of "agriculture stormwater" to exempt many land application-related agricultural discharges from the NPDES permitting.[119]

Furthermore, the U.S. Supreme Court has sought to weaken the CWA in recent years, such as in Sackett v. EPA (2023), which severely constricted protections under the Act for wetlands and other waterways by redefining what counts as "waters of the United States" (WOTUS),[120] and City and County of San Francisco v. EPA (2025), which ruled that EPA cannot issue generic pollution discharge limits that are based on "end results."[121] This is a significant move because, according to previous EPA estimates, 40% of waterways in the United States are impaired by pollution from CAFOs.[122]

The Clean Air Act (CAA) is the primary federal law that regulates air pollution in the United States. The statute requires EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and welfare (which states must meet and maintain), national performance standards to limit pollution from a wide variety of industries, and rules that protect against toxic air pollutants.[123]

Agricultural producers located in nonattainment areas (i.e., areas that are not meeting the NAAQS) are required to follow their state's State Implementation Plan (SIP) to bring air quality into compliance with NAAQS

and must obtain a "major source" permit when non-fugitive emissions of a regulated pollutant exceed a certain amount.[124]

However, compliance with national air-pollution laws has historically been low among CAFOs because EPA has refused to adhere to its enforcement duty and instead made exceptions for the animal agriculture industry.

For example, during the George W. Bush administration, the government secretly negotiated an agreement with the industry to refrain from enforcing the Clean Air Act against animal feeding operations that signed a deal referred to as the Air Consent Agreement.[125]

Similarly, EPA has failed to review its air-pollution standards for nitrogen pollution since 2018 and failed to update them since 2010, despite new scientific evidence that has found the health harms from nitrogen to be greater than previously understood.[126] Like the CWA, the CAA has also been under threat from recent Supreme Court rulings such as West Virginia v. EPA (2022), which limited EPA's ability to regulate carbon dioxide emissions from power plants,[127] and Ohio v. EPA (2024), which put on hold EPA's "good neighbor" plan to restrict emissions from power plants and several other industries.[128]

In February 2026 the EPA issued a huge blow to environmental protection by rescinding the greenhouse gas endangerment finding, its longstanding determination that greenhouse gases endanger public health, which in turn legally obligated the agency to act on any instances where the finding was present.[129] The repeal of the endangerment finding severely weakens the Clean Air Act and removes the legal requirement for the regulation of greenhouse gases in the United States.

Laws Regulating Animal Agriculture

When it comes to U.S. federal laws that specifically govern the activities conducted in and by animal agriculture operations, the biggest regulate meat, poultry, and egg inspection for public health reasons. The Federal Meat Inspection Act (FMIA), the Poultry Products Inspection Act (PPIA), and the Egg Products Inspection Act (EPIA) task USDA's Food Safety and Inspection Service (FSIS) with inspecting pre-slaughter and post-slaughter animal and egg products and slaughter operations to ensure the products are safe, wholesome, accurately labeled, and processed under sanitary conditions.[130] [131] [132]

However, concerns have long persisted over the failure of federal regulators to adequately oversee meat- and egg-processing facilities, particularly due to a lack of funding and personnel.[133]

Furthermore, the federal inspection acts do not authorize USDA to prosecute or punish industry for noncompliance. One cause for increased concern is USDA's recent efforts to waive limits on the number of animals allowed to be slaughtered per hour, or "line speeds," which could increase risk of worker injuries, animal suffering, disease spread, and food contamination,[134] as well as increasing environmental impacts through increased waste and carcass disposal needs, processing plant water and energy demands, and expansion and concentration of production.

As for laws to regulate the agriculture industry in the market, one law, the Packers and Stockyard Acts, executed by USDA's Agricultural Marketing Service (AMS), is meant to protect against monopolies and anti-competitiveness in the livestock industry by prohibiting certain practices including those related to fraud, preferential treatment, price manipulation, discrimination, and failure to pay.[135] There have been efforts to strengthen this act to better protect independent family farmers, via both USDA rulemaking and congressional bills, but progress has regularly been stymied by corporate agriculture lobbyists.[136]

Meanwhile federal laws regulating the on-farm, pre-slaughter treatment of animals raised for food are essentially nonexistent in the United States, making what happens in animal raising operations a black box. The only federal laws that come anywhere close to this type of regulation concern the treatment of farmed

animals during transport and slaughter.

The Twenty-Eight Hour Law states that animals being transported to slaughter may not be confined for more than 28 consecutive hours without being unloaded for five hours for food, water, and rest, with some exceptions.[137] The Humane Methods of Slaughter Act (HMSA) requires all livestock animals to be slaughtered "humanely," which means they must be rendered "insensible to pain" prior to slaughter.[138]

Both laws exempt poultry, apply far less to in-state jurisdictions, and have been criticized for weak enforcement.[139] [140] The previously mentioned issue of faster slaughter line speeds also raises concern over potential increased violations of HMSA.

Certain states have enacted stronger laws to protect against the harms of the industrial animal agriculture industry and improve animal welfare. Fifteen states have passed bans on certain forms of extreme farmed animal confinement[141] — California's Proposition 12 and Massachusetts's Question 3 are two of the strongest.[142] Prop 12 was upheld as constitutional by the U.S. Supreme Court.[143]

Over the years other states have passed moratoriums on building new CAFOs within certain regions, though all have been temporary and expired or scaled back since.[144] State laws to regulate animal-raising practices on farms have been met with vigorous ongoing opposition by not just animal agriculture lobbyists, but also by certain members of Congress and presidential administrations.

Ag-Gag Laws

Anti-whistleblowing legislation — referred to as "ag-gag laws" — are typically state-level laws that seek to "gag" would-be whistleblowers and undercover activists by punishing them for recording footage or other information of what goes on in animal agricultural operations, including CAFOs and slaughterhouses.

The laws, which can create criminal or civil liability, were originally designed to prevent the public from learning about animal cruelty but have also been extended in some states to shield the public from key information about environmental crimes. Backed by the animal agriculture industry, they have been introduced in over half of all states and, as of late 2024, are currently enacted in seven: Alabama, Arkansas, Iowa, Kentucky, Missouri, Montana, and North Dakota.[145]

Seventeen other states defeated ag-gag bills, while five states had their ag-gag laws overturned as unconstitutional by the judicial system.[146]

Although animal agriculture corporations have been trying — and more often than not, failing — to pass ag-gag laws since the early 1990s, they continue to persist and threaten anyone seeking to reveal the horrific treatment of workers and animals in industrial animal agriculture.

For example, even though Iowa's 2012 ag-gag law was struck down as unconstitutional by a U.S. District Court, its proponents continued to pass three more ag-gag laws, facing judicial challenges each time, until January 2024, when a federal appeals court overturned the lower courts' decisions and deemed the laws constitutional.[147]

Farmworkers' Rights

Agricultural exceptionalism has caused farmworkers to be exempted from many federal labor protections. Agricultural workers are explicitly excluded from certain protections under the National Labor Relations Act (NLRA), which was enacted in 1935 to encourage collective bargaining and protect employees' right to seek improved working conditions without fear of retaliation.[148] [149]

They are also exempted from overtime pay requirements under the Fair Labor Standards Act (FSLA), and employers who used fewer than 500 "man days" of agricultural labor in any quarter of the preceding year do not have to pay minimum wage to any agricultural employee in the subsequent calendar year.[150]

Other groups exempted from minimum wage and overtime provisions include: agricultural workers who are immediate family members of the employer, workers principally "engaged on the range" in livestock production, certain local hand harvest laborers, and certain minors under the age of 16.[151]

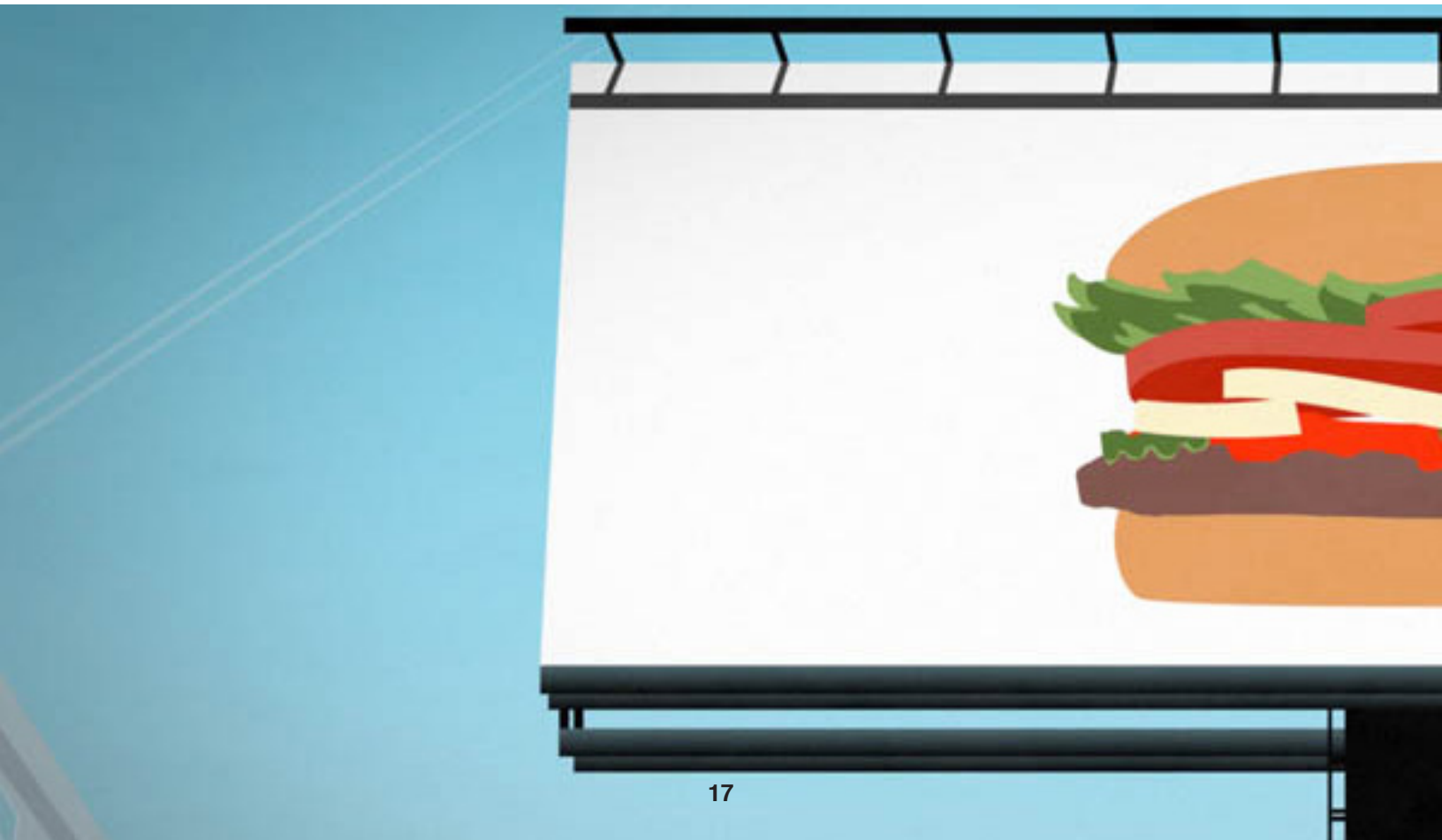
Despite agriculture being one of the most dangerous industries, the Occupational Safety and Health Administration (OSHA) is prohibited by law from using funds to enforce its regulations on farms or ranches with 10 or fewer employees and no temporary labor camps.[152] As of 2022 this means that the more than 980,000 farmworkers who work on farms with nine or fewer employees — or 45% of the national farmworker population — fall under this OSHA exemption.[153]

Farmworkers also face increased exposure to climate-related risks. Agricultural workers are 35 times more likely to die from heat-related stress than workers in other industries.[154] They're also susceptible to exposure to wildfire smoke from working outdoors, which can worsen respiratory diseases and has been linked to heart attacks, stroke, and lung cancer.[155] Yet they rarely receive any protections such as schedule changes or even information on how to protect themselves.[156]

Workers' rights are human rights, as recognized by the Universal Declaration of Human Rights, which include but are not limited to the right to freedom of association, to organize a union, and to bargain collectively free from reprisal.[157]

School Food Policies

School food policies are overseen by USDA's Food and Nutrition Service (FNS). Major legislation governing



the nation's school food policies include the Richard B. Russell National School Lunch Act of 1946, which created the National School Lunch Program (NSLP), the Summer Food Service Program, and the Child and Adult Care Food Program, and the Child Nutrition Act of 1966, which established the School Breakfast Program (SBP) and Team Nutrition Network, among other programs.[158]

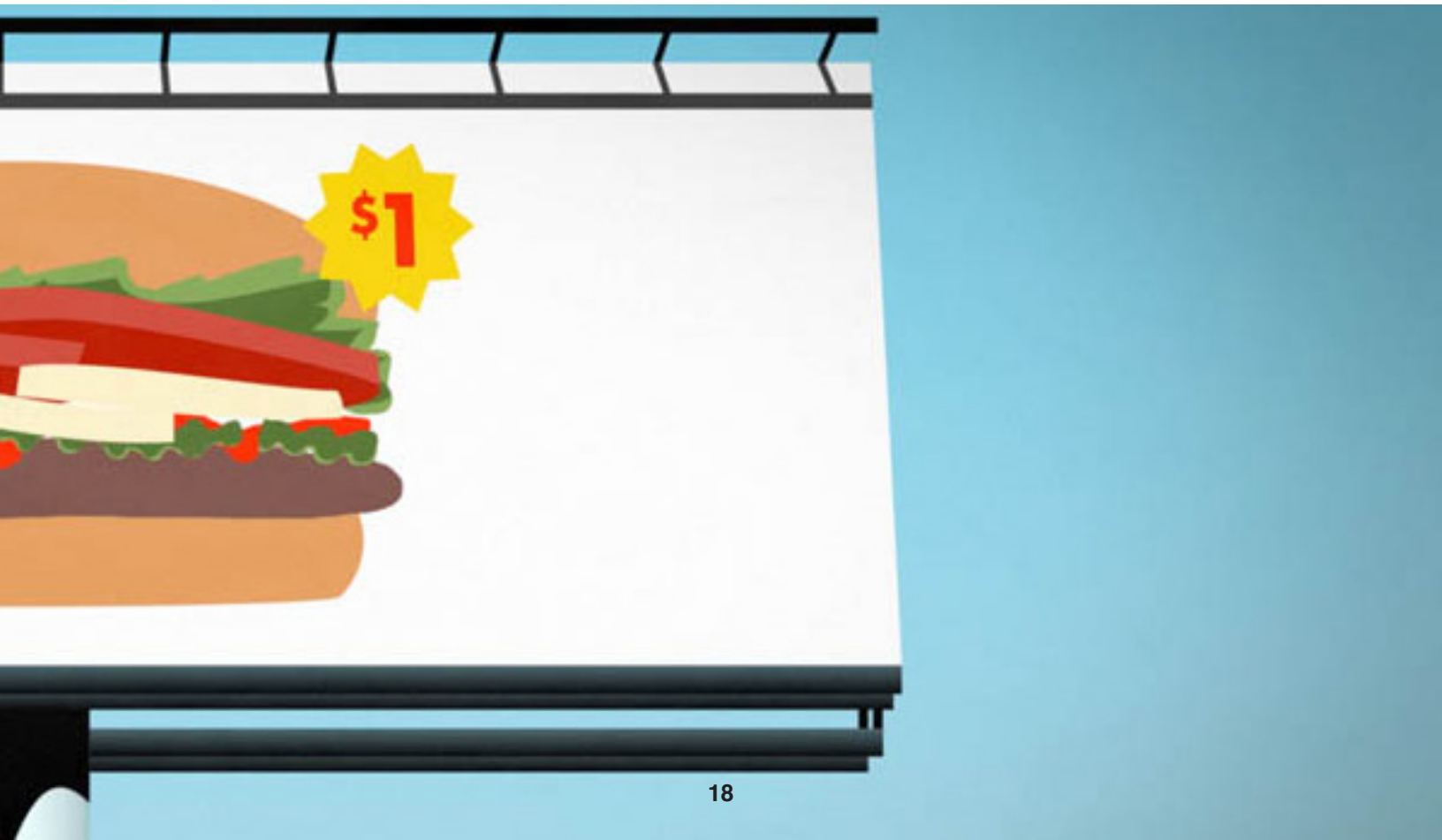
These programs provide funding for free or reduced-price school meals for students from low-income families. Congress is supposed to amend these programs every five years through Child Nutrition Reauthorization (CNR), but the last CNR to pass was the Healthy, Hunger-Free Kids Act of 2010.[159]

School food programs play a major role in our national food system. The federal government spends close to $40 billion per year on food programs for children and students,[160] serving approximately 9 billion meals to more than 53 million students.[161] For many students these federally funded meals are the primary source of nutrition.

Health and Nutrition in the United States

The leading U.S. causes of death and illness are attributable to lifestyle factors, including poor diet, smoking, high alcohol intake, and inactivity. The standard American diet[162] is characterized by excess calories from highly processed foods, saturated fats, added sugars and sodium together with under consumption of vegetables, fruit, whole grains and legumes.[163] [164]

These diet patterns contribute to high rates of obesity and overweight and diet-related diseases, including cardiovascular disease (CVD), diabetes, hypertension, and some cancers. In 2022, heart disease, stroke, diabetes and kidney disease together contributed to 32% of deaths, with an additional 18.5% of deaths from cancer.[165]



High consumption of red and processed meat stands out in the American diet due to its oversized impact on human and planetary health. The majority of protein foods consumed in the United States are meat and animal products, typically high in saturated fat and cholesterol compared to more nutrient-dense, health-promoting plant-based options such as beans, peas, lentils, soy products, nuts, and seeds. Currently 32% of calories come from animal foods.[166]

Meat consumption in the United States has nearly doubled in the past century. Americans are now among the top per capita meat consumers in the world, and the average American eats three times the global average.[167]

Although per capita poultry consumption has increased, most of the meat consumed is still red meat (beef, pork, lamb), and nearly a quarter is processed meat (hot dogs, bacon, sausages, deli meats).[168]

Meat is a source of protein and other essential nutrients; however, most Americans eat more than 1.5 times the average daily protein requirement[169] and consume more than the recommended amount of foods from the USDA Protein Foods group.

A growing body of evidence suggests Americans' taste for meat and animal products is putting them at greater risk for a range of health problems. Excess meat consumption, particularly red and processed meat, is associated with heart disease,[170] [171] [172] stroke,[173] [174]type 2 diabetes,[175] [176] [177] obesity,[178] certain cancers,[179] [180] and earlier death.[181]

A 2020 study found that among U.S. adults, higher intake of processed meat, unprocessed red meat, or poultry, but not fish, was significantly associated with a small increased risk of incident CVD, whereas higher intake of processed meat or unprocessed red meat, but not poultry or fish, was significantly associated with a small increased risk of all-cause mortality.[182] Processed meat specifically is linked to higher rates of cancer and has been classified by the World Health Association as a carcinogen.[183]

Studies give several reasons why high consumption of meat may increase health risks. These include high saturated fat and cholesterol content, high energy density, carcinogenic compounds found in processed meat and formed during high-temperature cooking, heme iron, production of Trimethylamine–N-oxide (TMAO) by the gut microbiome and the lack of health-protective plant foods in high-meat diets.[184] [185] [186]

On the other hand, diets high in vegetables, fruits, whole grains and beans can help prevent chronic diseases and promote health. A 2023 systematic review and meta-analysis looked at the dose response of 10 dietary factors and concluded that a long-term high intake of whole grains, fruits and vegetables and nuts significantly reduced cardiovascular mortality.[187]

Another 2023 systematic review and meta-analysis found that substitution of any animal-based foods (red and processed meat, eggs, dairy, poultry, butter) with plant-based foods (nuts, legumes, whole grains, olive oil) is beneficially associated with cardiometabolic health and all-cause mortality.[188] Overall, plant-based diets (i.e. vegetarian or vegan diets) appear beneficial in reducing cardiometabolic risk factors, as well as CVDs, cancer risk, and mortality.[189]

Although more Americans are open to consuming plant-based diets,[190] the increased acceptance of plant-based foods has occurred alongside the growth of highly processed novel meat and dairy alternatives and plant-based reformulations of existing products.[191] [192] Such products make plant-based eating easier for consumers, but they may mitigate the health benefits typically ascribed to plant-based diets.[193]

A 2020 study compared plant-based meat substitutes with red meat and found that when all other dietary components were similar, plant products improved several cardiovascular disease risk factors;[194] however, studies assessing health impacts of these new products remain few.

People who eat primarily plant-based diets consume more whole grains, fruit, protein foods, seafood and plant proteins, and less sodium, refined grains and added sugars compared to average U.S. consumption, even with equivalent intake of ultra processed foods (over half of total energy).[195] Further research is needed on the impact of higher processed plant-based products, compared to red and processed meat and, separately, whole plant proteins.[196]

While working toward healthier diets and a just protein transition, it's imperative to acknowledge the many factors surrounding consumer food decisions in the United States.

Food choice is driven by individual and interpersonal factors, such as knowledge, health, culture and preferences; socioeconomic factors, including affordability and availability; and the larger food environment and policies that shape it.

A 2025 study classified dietary patterns and cardiometabolic risk factors and found that those with higher levels of social risk factors reported less healthy diets and higher rates of diabetes, hypertension, obesity and dyslipidemia. Social risk factors included lower education attainment, single adult households, low food security, underinsured, unemployed, and low access to healthcare.[197]

Geographic and racial disparities in access to healthy foods further exacerbate health inequities. An estimated 19 million Americans live in low-income, low-access areas — often called "food deserts" or "food apartheid" — where access to full-service grocery stores and fresh produce is severely limited.[198]

Households in low-income neighborhoods have 25% less access to grocery stores with fresh produce than those in wealthier areas.[199] A 2022 USDA report found that people living in low-income, low-access communities are up to 50% more likely to suffer from diet-related diseases compared to those in food-secure neighborhoods.[200]

Inequity in the food system has resulted in disparate access to healthy foods across communities and individuals. Effective, systems-based solutions must address the multiple complexities and drivers that influence food choices. Public health experts have long advocated for policy reforms such as front-of-package warning labels, restrictions on junk-food marketing targeted at children, and taxes on sugar-sweetened beverages.[201]

However, food and beverage corporations have spent millions lobbying against these efforts. Over the past two decades, the ultra-processed food industry spent more than a billion dollars on lobbying — significantly more than the tobacco or alcohol industries.[202] These efforts prioritize corporate profits over public health and reinforce structural barriers to nutritional equity.

Solutions must also be evidence-based and consistent with long-term nutrition research. Unfortunately health information is increasingly sourced from social media and influencers, which has resulted in a plethora of misinformation and biased diet and health recommendations. Health professionals should highlight and promote reliable sources of information for consumers, such as those from registered dietitians and qualified nutrition professionals.

The Make America Healthy Again Moment

The "Make America Healthy Again" (MAHA) movement gained momentum by raising concerns about some of the same issues that many food systems advocates have been working on for decades, including our outrageously lax pesticide regulatory system, food industry consolidation, the ubiquity of ultra-processed foods instead of nutritious whole foods in schools, and overuse of antibiotics in farm animals.

In 2025 the newly established MAHA Commission, chaired by Health and Human Services Secretary Robert

F. Kennedy, Jr., promised to address high rates of chronic disease — particularly obesity and diabetes — in children related to poor diets, envisioning a world where "American farmers are put at the center of how we think about health."[203]

However, rather than a transformational approach to food industry reform, the administration has focused on obtaining voluntary industry commitments on efforts such as removing food dyes from processed foods, and state-led efforts such as eliminating the ability to use Supplemental Nutrition Assistance Program (SNAP) funding for sugary drinks.

It also undermined stated MAHA goals with widespread cuts to programs that support farmers and make nutritious food more accessible. For example, in March 2025 the U.S. Department of Agriculture cut $660 million from programs funding local food in schools and childcare settings.

In September 2025 the MAHA Commission released its MAHA strategy report,[204] which was expected to describe the administration's approaches for ending childhood chronic disease and how it planned to respond to increasing pressure from agribusiness interests.

Washington Post columnist Leana Wen aptly summarized the strategy, "At best, it's a disappointing grab bag of half-baked ideas."[205]

Although the report was sparse in detail, some of the strategy's initiatives could be beneficial — such as working to better connect local food producers to schools in the farm-to-school grants program — if not for the administration's other actions, including severe budget cuts.

Meanwhile the MAHA strategy acknowledges the negative impacts of consuming ultra-processed foods and highlights the need for a clear definition of them; but it fails to mention policies or actions to promote production or consumption of whole, healthy foods. It narrowly calls for removal of food dyes and chemical additives, which will do little to move the needle on childhood obesity and other chronic diseases.

The strategy report also mentions the 2025-2030 Dietary Guidelines for Americans (DGA), which has an enormous influence on food and nutrition policy and programs. But rather than follow the rigorous scientific report of the Dietary Guidelines Advisory Committee, the new DGA reflects misguided nutrition ideas, favoring increased beef and whole milk consumption and contradicting substantial evidence linking saturated fat (not seed oils) to cardiovascular disease.

Industrial meat producers applaud this shift, which overlooks the health risks associated with high meat and high fat diets that are low in fruit, vegetables, whole grains, and legumes. These recommendations go against the stances of major medical organizations, including the American Heart Association, and ignore the benefits of affordable, fiber-rich and nutrient-dense plant-based proteins like beans, peas and lentils that are crucial for improving health outcomes.

And, unsurprisingly, the Trump administration has proven itself to be a staunch ally of the pesticide industry. It proposed approval for five new PFAS pesticides, and already approved two as of November 2025. It also issued an executive order promoting glyphosate, the most heavily used pesticide in the United States. The Trump administration sided with the pesticide industry before the Supreme Court of the United States, asking for it to rule in favor of pesticide giants in a case aimed at preventing cancer victims from getting their day in court.

Even though MAHA advocates have pointed out real problems with our food and agriculture systems — problems that the government should very much be working to address — it's clear that the administration is failing to meaningfully make any progress toward actually making America healthy again.

The Role of Alternative Proteins in a Just Transition

Alternative proteins — engineered proteins that are plant-based, cultivated, or fermentation-derived — require significantly less land, water, and energy to produce than conventional animal-based meat and dairy products.[206] [207] As such they can play a meaningful role in addressing the environmental harms of high meat consumption by rapidly increasing the availability of humane, sustainable proteins — particularly in countries like the United States where people consume far above the global average. The increased use of alternative proteins can help accelerate the shift toward diets within planetary boundaries, freeing up land and resources to support diversified agroecological production systems.[208]

However, alternative proteins are not the end goal of a just transition, and there are substantial concerns about the social and public health dimensions of the sector.

Additionally, newer alternative protein technologies — particularly those that rely on high levels of capital investment or proprietary technology — raise questions about ownership, control, and equitable access within the food system. As the industry continues to grow, alternative proteins are considered a potential short-term tool to help reduce consumption of animal-based products in high-consuming countries, provided that development and deployment prioritize public benefit, transparency, and community-centered production models.

Environmental Benefits of Alternative Proteins

In the short term, even a partial shift to alternative proteins can significantly reduce pressure on agricultural land, natural habitats, and the climate. Modeling by the World Business Council for Sustainable Development and the Good Food Institute indicates that shifting 50% of U.S. meat consumption to alternative proteins would spare approximately 47.3 million acres of cropland and enable the sequestration of 178 million tons of CO_2 annually.[209]

Globally, replacing just 20% of red meat consumption with alternatives by 2050 would halve deforestation and its associated carbon emissions.[210] Another analysis estimates that a 50% global switch from conventional meat to alternative proteins could reduce emissions by approximately five gigatons CO_2 per year.[211] These reductions would bring us significantly closer to meeting urgent emissions targets while freeing up cropland for agroecological farming or ecological restoration.

Greenhouse gas reductions: Plant-based and cultivated (lab-grown) proteins emit far fewer greenhouse gases than conventional meat. An Impossible Burger yields approximately 89% fewer GHG emissions than a beef burger, while a Beyond Burger emits roughly 90% fewer GHG emissions.[212]

Land and water savings: Life-cycle assessments show that cultivated meat could use up to 95% less land and 78% less water than conventional beef. Plant-based burgers, such as Beyond, require approximately 93% less farmland and 99% less water than beef.[213]

Feed crop reductions and deforestation: Manure contributes roughly 21%–24% of total greenhouse gas emissions from U.S. pork production, but most of meat's overall carbon footprint comes from feed cultivation and land clearing.[214] Accounting for land clearing more than triples poultry's carbon cost in Brazil and nearly doubles it in Europe.[215] Cutting back on feed-driven expansion is therefore critical to reducing emissions.

Compared to conventional livestock production — which relies heavily on vast monocultures of genetically

engineered (GE) corn and soy — alternative proteins significantly reduce demand for feed crops. It takes up to 89 times more GE monoculture crops to produce one pound of beef than it does to produce one pound of plant-based meat.[216] [217]

Supporting Local and Regional Food Systems for Alternative Protein Production

Alternative proteins produced with sustainable ingredients, agroecological principles, fair labor practices, and fair payments to farmers can contribute to equitable, community-centered food system solutions. Supporting small, locally owned businesses, cooperatives, and worker-driven, profit-sharing models will be critical to ensuring these products align with just transition principles.

Building alternative protein opportunities can create new jobs and economic growth while supporting workers and communities transitioning away from industrial animal agriculture. One estimate forecasts that a global transition to alternative proteins could support 83 million jobs and generate $700 billion in economic value by 2050.[218] However, it's essential that these jobs are rooted in worker-driven models that provide safe working conditions, livable wages, and strong labor protections.

Alternative protein supply chains can offer a more decentralized model than the highly concentrated and export-driven industrial meat sector, but this outcome is not guaranteed. Intentional policy design is needed to prevent consolidation and ensure that production does not simply replicate the corporate concentration that dominates animal agriculture today. Fermentation units, cultivated-meat facilities, and plant-protein processing centers can be built locally and scaled to meet regional demand, reducing reliance on imports and strengthening food security.[219] These facilities also present opportunities for cooperative ownership models, worker-driven social responsibility, and higher environmental and labor standards.

Regional alternative protein infrastructure can create jobs in manufacturing, research, and distribution while diversifying agricultural and processing sectors.[220] Farmers can gain new markets by transitioning away from monoculture feed crops toward pulses, algae, or other protein crops for local food production. A global review finds that transitioning to alternative proteins can improve farmers' livelihoods and increase resilience to climate and supply chain shocks.[221]

The Role of Alternative Proteins in Public Health

Overall, alternative proteins tend to be healthier than conventional meats, with outcomes varying by ingredient composition and production process. Some products rely on simple, whole-food ingredients, while others — though more processed — still avoid many of the risks associated with processed red meat.[222]

Alternative proteins do not use nitrites or nitrate preservatives, which can generate carcinogenic compounds linked to colorectal cancer.[223] They are also designed to replace many of the least healthy items in the American diet — particularly fast-food meat products, which nearly 1 in 3 Americans consumes daily.[224]

Plant-based meats tend to be lower in saturated fat, calories, and cholesterol, and higher in fiber, iron, and complex carbohydrates than conventional meat.[225] These nutritional differences contribute to improvements in cholesterol levels, weight management, cardiovascular health, and gut function.[226]

Fermentation-derived proteins use microbes to enhance nutrient density. Quorn's mycoprotein, for example, has been shown to promote muscle protein synthesis more effectively than milk protein.[227] Many alternative protein products rely on simple formulations, such as the whole jackfruit used in Jack & Annie's products[228] or Meati Foods' mycelium-based steak, which contains only mycelium (*Neurospora crassa*), salt, natural flavor, and fruit and vegetable extract.[229]

Cultivated proteins contain the same cellular components as conventional meat but are produced in clean

bioreactors, eliminating the need for antibiotics, hormones, or steroids and significantly reducing the risk of foodborne pathogens.[230] [231]

The Future of Alternative Proteins in a Just Transition

The full health and environmental impacts of alternative proteins depend on multiple factors, including energy sources, production efficiency, scalability, and long-term life-cycle impacts. Open questions also remain about whether the sector can align with food sovereignty goals, given its emergence within an industrial food system context.

Alternative proteins should not be viewed as the final destination in food system transformation.

Traditional plant-based foods and diversified agroecological farming systems must remain the foundation of future diets, while newer alternative protein technologies may play a limited, transitional role in reducing dependence on industrial livestock production in high-consuming countries. Safeguards must be implemented to ensure the sector does not replicate the consolidation, labor exploitation, or environmental harms associated with industrial animal agriculture. A just transition requires community-led, cooperative, and agroecologically rooted food systems.

Moving Toward a Just Transition in the United States

The current U.S. food system is characterized by overproduction and overconsumption of industrial animal products, consolidated corporate control, inequitable access to healthy diets, and policies and practices that exploit workers, animals, and the environment. At the same time, the United States is a country of rich cultural heritage, diverse foodways, and strong, local communities. It's in those spaces that the just transition is already happening, where we can build on existing models to transform our food system.

Indigenous Foodways: Decolonizing U.S. Food and Agriculture

Intensive, factory-driven animal agriculture and industrial-scale ranching are food systems built and introduced by settlers to the American continent.[232] [233] Cattle ranching has historically been the method and justification of American colonization, which quickly began to alter and destroy native ecosystems.[234] In the American West, virtually all privately owned agricultural lands were once obtained through the violent displacement of Indigenous communities.[235]

The destruction of Indigenous sovereignty and sacred cultural traditions was a primary goal of the mass slaughter of native bison, a key source of food and cultural connection for many western tribes.[236] Rapid expansion of the cattle industry at the expense of Native populations greatly increased both wealth and land control for colonizers, and through the centralization of western cattle markets, grew into the industrial beef economy and meat-heavy U.S. diet of today.[237] This industrial system of exploitation, violence, dispossession, and injustice that U.S. animal agriculture is rooted in continues to perpetuate disproportionate harms against Indigenous communities.

Indigenous people in the United States are more likely to live near industrial animal agriculture facilities that produce enormous amounts of toxic pollution. In North Carolina, for example, where hog facilities in the state produce over 9 billion gallons of liquid waste and sludge per year,[238] more than twice as many Indigenous people live within three miles of an industrial hog facility as non-Hispanic whites. Studies have proven that proximity to such facilities is linked to higher risks of health issues, including cardiovascular mortality,[239]

gastrointestinal illness,[240] and allergic and respiratory disease.[241]

Indigenous people in the United States also experience some of the worst diet-related health disparities and chronic disease.[242] [243] An enduring legacy of the slaughter, dispossession and colonization of Indigenous peoples continues today in the lack of access to not only traditional but also nutritious and healthy foods,[244] and as a result many Indigenous communities face an elevated risk of diabetes.[245]

Modern federal food assistance programs like the Food Distribution Program on Indian Reservations (FDPIR),[246] which many Tribal nations rely on due to widespread food insecurity on reservations, primarily consist of ultra-processed foods and lack fresh fruits and vegetables.[247] One study found that the average FDPIR food package does not meet the nutritional requirements of the Dietary Guidelines for Americans and may increase risk for obesity and nutrition-related diseases.[248]

Indigenous food sovereignty is a vision of interdependency for bringing foodways back in balance with the Earth that includes restoring principles of relationship and responsibility between human communities and the land, refreshing cultural practices and reclaiming land. Indigenous food sovereignty includes tribal control over food policies, land management, and food traditions. It includes foodways that promote ecological health, are community-based and fair and emphasize just access to healthy and nutritious foods.

Food is an integral part of cultural practices, health and wellbeing, and sovereignty.[249] Restoring traditional foodways and paths to food justice can help tribal communities reclaim cultural identities and collective self-determination over food systems.[250]

A just transition in U.S. agriculture must therefore be rooted in the decolonization of food and farming, including returning land to Indigenous peoples and promoting knowledge-sharing and traditional practices. It must also include a recognition of the historical legacy of colonization, settler violence and dispossession of land in the United States. Decolonizing food and farming can support Indigenous food sovereignty while building a more sustainable food system for everyone.

Agroecology vs. Regenerative Agriculture

As a popular movement within the United States to shift away from industrialized agricultural impacts, regenerative agriculture envisions food production primarily as a set of practices that prioritize processes of soil and carbon, with an economic marketplace that values sustainability. It makes big claims about its power to farm while healing the Earth. However, as a movement, it is distinctly different from the well-established and scientifically grounded global agroecological movement.

The principles of agroecology are based on economies of solidarity and circularity that build equality and social justice and thus share fundamental values of a just transition.[251] Agroecology is a well-defined science and social movement that addresses the full impact of food systems within a framework of justice, community and ecology — from production to processing, distribution and consumption.

It prioritizes the livelihoods and protects the rights of small-scale farmers while celebrating traditional knowledge and protecting the health of ecosystems. This approach offers a vision for a collective future that is a celebration of life and diversity. It is an acknowledgement and systematic recognition of the connections between sky, land, water, forests, farms, oceans, rivers and valleys, and wild and human communities. Agroecology aims to protect the diversity of interdependent life sharing relationships with natural elements.

In contrast, regenerative agriculture does not include the complex goals of key pieces, such as gender and racial parity in farming, farm loans, worker rights, access to healthy food, improved community connections, or a deep kinship with nature. Instead it approaches farming in a disconnected way, aiming to shift away from the ravages of industrial agriculture, without attending to the larger social implications of agriculture.

At its best regenerative farming is based on Indigenous practices that improve soil health, water conservation, biodiversity, and climate resilience. Its principles include minimizing soil disturbance, cover crops, root systems, and soil health and diversity.

Yet there is no real definition, standards, or accountability to ensure the reality of practices or achievement of regenerative goals. As a movement it often downplays, or harms holistic ecosystem impacts while highlighting specific, isolated practices.[252] As a result the term "regenerative agriculture" has been co-opted by corporations focused solely on temporary and limited soil and carbon emissions reductions.[253] Its claims are vulnerable to greenwashing, with corporations using vague or misleading language to continue business-as-usual production.[254] [255] These days, "regenerative" is mostly a marketing term to appeal to sustainably minded consumers without addressing the social dimensions of food systems.[256] [257]

Regenerative farming practices can be stepping stones toward a more sustainable food system. But isolated practices do not encompass the needs or principles of a just transition. Unlike agroecology, regenerative goals simply do not go far enough to address the food system's impact on workers, animals, and the environment or to accept responsibility for decolonizing food and agriculture, building food sovereignty, and shifting control from corporations back to communities.

The Importance of Cooperatives in a Just Transition

A just transition away from industrial agriculture must shift power and decision-making to communities, centering the principles of connection, reciprocity, and sovereignty within food systems.[258] Relying on profit-focused models to fuel the transition conflicts with the democratic governance and public accountability needed for any political framework to serve the public good.

In other words, we can't truly solve the problem of a corporate-controlled, industrial food system using the same structures that created it. Cooperative structures — such as food and farm co-ops — offer an equitable, efficient, and time-tested model for sharing economic, social, and environmental power and responsibility.

While there is no single definition for cooperatives since their structures vary by context, they typically share characteristics such as being independent entities that are jointly owned and democratically governed, with earnings distributed based on use instead of investment. Membership is voluntary and participatory, and there are typically shared principles of education, cooperation, and concern for community.[259]

Cooperative models are used globally to address myriads of issues, from poverty to gender inequities. They have successfully shown how participatory processes help identify, instrumentalize, and inspire locally rooted, transparent, and co-created just solutions to overcome intersectional societal challenges.[260] [261] [262]

In the just transition away from industrial agriculture, such cooperatives can renegotiate the power structures that enable industrial concentration within agriculture systems. Such reclaiming of power can ensure that those most affected have the ability for collective bargaining and a shared stake to define, determine, and democratize the just transition, while centering equitable and accountable governance and operations.

Cooperativism challenges the core premise of capitalism of the ultimate quest for individual gains at the expense of others.[263] Instead of a delirious pursuit of private property, destructive production practices, and colonial extraction of nature, cooperative networks allow for acknowledging the inherent value of the commons, long-term holistic wellbeing, and global solidarity to cultivate a political economy that functions in harmony with ecosystems while celebrating indigenous wisdom.

The Role of Local and Regional Food Systems

In local and regional food systems, every step from food production, distribution, and sales to consumption and

waste management typically happens within a locally or regionally defined geographic area. But communities may also define these systems by marketing channels, farming practices, ownership, labor conditions, or values such as equity, nutrition, or sustainability.[264] Local and regional food systems can play a critical role in driving food systems transformation. [265] [266] [267]

Local and regional food systems shorten supply chains and embed food economies within local contexts. They build community around food, farming, sustainability, and nutrition, while increasing resilience to supply chain disruptions, climate-related shocks, and foodborne illness outbreaks.[268] [269] [270] [271] These systems help retain a greater share of food dollars within communities, boosting local economic development and ensuring that producers receive a larger portion of the profit.[272] [273] [274]

They also offer viable alternatives to industrial models like concentrated animal feeding operations (CAFOs) by supporting small- and mid-sized farms, advancing equitable distribution systems, promoting agroecological practices, and fostering informed consumer engagement.[275] [276] [277] [278]

Consumers often receive information at the point of purchase about a food's origin and its benefits to the community, which can build trust and transparency.[279] [280] [281] In that way local and regional food systems can serve to reconnect agriculture with environmental stewardship and public health, creating opportunities for systemic change rooted in community-led solutions.[282] [283]

To ensure that local and regional food systems deliver community benefits, it is essential that the community identifies its needs and priorities.[284] These systems can benefit sustainability, equity and resilience, although their environmental, economic, and social benefits vary by locality, scale, design and implementation.[285] [286] Thus, transparency about values, tradeoffs and impacts is critical to accelerating just transition via local and regional food systems.

Food Policy Councils and Just Transitions

Food Policy Councils (FPCs) are multistakeholder bodies that bring together community members, local governments, nonprofits, farmworkers, and private sector representatives to identify, assess and address local food system challenges.[287] [288]

They serve as hubs for dialogue, policy coordination, and program development, often identifying gaps in the food landscape and opportunities for advancing public health, sustainability, and economic resilience.[289] [290] [291] [292] Since the establishment of the first FPC in 1982, this model of collaborative food system governance has expanded to include more than 300 active councils across the United States as of 2023.[293] [294]

FPCs strengthen local governance by creating spaces for collaborative decision-making that reflect community priorities.[295] [296] Through education, capacity-building, and public engagement, FPCs have elevated the voices of historically underrepresented stakeholders and supported initiatives that build more sustainable and equitable food systems aligned with local values and aspirations.[297] [298] These efforts can also help shift municipal priorities by increasing city governments' commitment to addressing systemic food access, production, and distribution issues.

FPCs can advance alternatives to industrial food system models by supporting supply chain infrastructures and distribution channels that retain value locally, advocating for procurement practices that favor smaller producers and sustainable practices, and implementing programs rooted in food and environmental justice.[299] [300] [301]

In doing so FPCs serve as key stakeholders for advancing just food transitions. By enabling residents to engage as active agents in shaping their food futures, FPC's participatory approach is crucial for navigating the complex tradeoffs and power dynamics within food systems.[302]

Their work demonstrates that place-based governance and participatory planning are not only feasible, but essential for building more democratic, resilient, and just food systems. To learn more about the work of FPCs across the United States, visit foodpolicynetworks.org.

References

[1] U.S. EPA. (n.d.). *Regulatory definitions of large CAFOs, medium CAFOs, and small CAFOs.* https://www3.epa.gov/npdes/pubs/sector_table.pdf

[2] U.S. EPA. (n.d.). *Our mission and what we do.* https://www.epa.gov/aboutepa/our-mission-and-what-we-do

[3] USDA Economic Research Service. (2023). *Farmland ownership and tenure*. U.S. Department of Agriculture. https://www.ers.usda.gov

[4] USDA Economic Research Service. (2026). *Farmland ownership and tenure*. U.S. Department of Agriculture. https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/farmland-ownership-and-tenure

[5] USDA Economic Research Service. (2026). *Farmland ownership and tenure*. U.S. Department of Agriculture. https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/farmland-ownership-and-tenure

[6] Equal Justice Initiative. (2023, July 19). *One million Black families have lost their farms*. https://eji.org/news/one-million-black-families-have-lost-their-farms/

[7] International Land Coalition. (n.d.). *Framing land inequality: Its centrality and its impact*. https://www.landcoalition.org/en/uneven-ground/framing-land-inequality-its-centrality-and-its-impact/

[8] American Farmland Trust. (2020). *Farms under threat: State of the states*. https://farmlandinfo.org/publications/farms-under-threat-the-state-of-the-states/

[9] USDA National Agricultural Statistics Service. (2023). *Acreage report*. https://esmis.nal.usda.gov/sites/default/release-files/j098zb09z/hh63v8465/zg64w269x/acrg0623.pdf

[10] USDA Economic Research Service. (2025). *Land use, land value and tenure.*. https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure

[11] USDA Office of the Chief Economist. (2019). *World Agricultural Supply and Demand Estimates*. https://www.usda.gov/sites/default/files/documents/May_2019_WASDE_Lockup_Briefing.pdf

[12] USDA Natural Resources Conservation Service. (2015). *Soil health literature summary.* https://www.nrcs.usda.gov/sites/default/files/2022-10/Soil_Health_Literature_Summary_Effects_of_Conservation_Practices_Jan2015.pdf

[13] Rosset, P., Machín Sosa, B., Roque Jaime, A. M., & Ávila Lozano, D. R. (2012). Agroecological approaches to enhance resilience. *Farming Matters, 28*(2), 12–15. https://archive.foodfirst.org/wp-content/uploads/2016/02/Farming-Matters-28-2-Agroecological-approaches-to-enhance-resilience.pdf

[14] Happ, M. (2025). *Q&A: What's next for the Farm Bill?* Institute for Agriculture and Trade Policy. https://www.iatp.org/farm-bill-qa-2025.

[15] USDA Census of Agriculture. (2017). *Demographic characteristics of U.S. farmers*. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Demographic_Profiles/index.php

[16] Federation of Southern Cooperatives. (2021). *Land retention. https://www.federation.coop/land-retention*

[17] Brown, W. (2023). *How the Long Shadow of Racism at USDA Impacts Black Farmers in Arkansas—and Beyond.* https://civileats.com/2023/03/08/how-the-long-shadow-of-racism-at-usda-impacts-black-farmers-in-arkansas-and-beyond/#.

[18] Faber, S. (2017). *The Real Farm Subsidy Scandal? USDA's Legacy of Racial Discrimination*. Environmental Working Group. https://www.ewg.org/news-insights/news/real-farm-subsidy-scandal-usdas-legacy-racial-discrimination

[19] USDA Economic Research Service. (2026). *Land Use, Land Value & Tenure - Farmland Value.* https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/farmland-value

[20] USDA ERS. (2022). *America's diverse family farms: 2021 edition*. https://ers.usda.gov/sites/default/files/_laserfiche/publications/102808/EIB-231.pdf?v=37066

[21] MacDonald, J. M., & Korb, P. (2011). *Agricultural contracting update*. USDA Economic Research Service. https://ers.usda.gov/sites/default/files/_laserfiche/publications/44631/29537_eib9_reportsummary.pdf?v=54133

[22] Whitt, C. (2022, April 29). *Contracts are common in animal and crop production.* USDA Economic Research Service. https://ers.usda.gov/data-products/charts-of-note/chart-detail?chartId=103803

[23] Pew Commission on Industrial Farm Animal Production. (2008). *Putting meat on the table*. https://www.pew.org/en/research-and-analysis/reports/0001/01/01/putting-meat-on-the-table

[24] Drake University, Farm Service Agency, and National Sustainable Agriculture Coalition. (2016). *Contracting in agriculture: Making the right decision.* https://sustainableagriculture.net/wp-content/uploads/2017/03/2016-Drake-FSA-NSAC-Production-Contracts-Guide.pdf

[25] Mishler, J. (2022, July 27). *How the U.S. poultry industry is crushing contract chicken farmers.* Sentient Media. https://sentientmedia.org/how-the-poultry-industry-is-crushing-contract-chicken-farmers/

[26] Food Integrity Campaign. (2021, December 14). *Unchecked corporate power and exploitation: The truth about contract growing.* https://foodwhistleblower.org/unchecked-corporate-power-and-exploitation-the-truth-about-contract-growing/

[27] National Oceanic and Atmospheric Administration. (2023). *Gulf of Mexico dead zone forecast*. https://coastalscience.noaa.gov/news/below-average-summer-2023-dead-zone-measured-in-gulf-of-mexico/

[28] U.S. Environmental Protection Agency. (2022). *Nutrient pollution overview*. https://www.epa.gov/nutrientpollution

[29] World Wildlife Fund. (n.d.). *Protecting pollinators by reducing pesticides.* https://www.worldwildlife.org/our-work/wildlife/protecting-

pollinators-by-reducing-pesticides/

[30] Ohio-Kentucky-Indiana Water Science Center (2017). *Pesticides.* U.S. Geological Survey. https://www.usgs.gov/centers/ohio-kentucky-indiana-water-science-center/science/pesticides

[31] Center for Biological Diversity. (2022, February 22). *New report: More than 200 million pounds of pesticides in US are applied to crops grown to feed animals on factory farms*. https://biologicaldiversity.org/w/news/press-releases/new-report-more-than-200-million-pounds-of-pesticides-in-us-are-applied-to-crops-grown-to-feed-animals-on-factory-farms-2022-02-22/#

[32] Pesticide Action Network. (n.d.). Pesticides and health. https://www.panna.org/our-work/pestcides-health/

[33] The Earth Restoration Foundation. (n.d.). *Pollution from farms.* https://earthrestorationfoundation.org/animal-waste/

[34] Natural Resources Defense Council. (n.d.). *Industrial agriculture 101.* https://www.nrdc.org/stories/industrial-agriculture-101

[35] Hribar, C. (2010). *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities.* U.S. Centers for Disease Control and Prevention. https://stacks.cdc.gov/view/cdc/59792

[36] Domingo, N.G.G., Balasubramanian, D., Thakrar, S.K., Clark, M.A., Adams, P.J., Marshall, J.D., Muller, N.Z., Pandis, S.N., Polasky, S., Robinson, A.L., Tessum, C.W., Tilman, D., Tschofen, P., & Hill, J.D. (2021). Air quality–related health damages of food. *PNAS, 118*(20), e2013637118. https://doi.org/10.1073/pnas.2013637118

[37] OpenSecrets. (2022). *Agricultural lobbying*. https://www.opensecrets.org/industries/lobbying?cycle=2022&ind=A

[38] Olafsson, Bjorn. (2023, June 28). *What are right to farm laws?* Sentient Media. https://sentientmedia.org/right-to-farm-laws/

[39] U.S. Department of Labor. (2021). *National Agricultural Workers Survey (NAWS)*. https://www.dol.gov/agencies/eta/research/publications/findings-national-agricultural-workers-survey-naws-2021-2022

[40] Farmworker Justice. (n.d.). *Visualization of Data from the National Agricultural Workers Survey (NAWS).* https://farmworkerjustice.org/en/resources/labor/national-agricultural-workers-survey/resource-NAWS-INTERACTIVEMAP

[41] National Employment Law Project. (2023). *Excluded worker programs.* https://www.nelp.org/insights-research/excluded-worker-programs/

[42] El Khayat, M., Halwani, D. A., Hneiny, L., Alameddine, I., Haidar, M. A., & Habib, R. R. (2022). Impacts of Climate Change and Heat Stress on Farmworkers' Health: A Scoping Review. *Frontiers in public health, 10,* 782811. https://doi.org/10.3389/fpubh.2022.782811

[43] Barrett R., et al. (2008). Acute Pesticide Poisoning Among Agricultural Workers in the United States, 1998–2005. *American Journal of Industrial Medicine, 51*(12). https://stacks.cdc.gov/view/cdc/186852

[44] Costa, D., & Martin, P. (2023). *Federal labor standards enforcement in agriculture*. Economic Policy Institute. https://www.researchgate.net/publication/347263457_Federal_Labor_Standards_Enforcement_in_Agriculture

[45] U.S. Department of Labor. (2018). *NAWS Research Report No. 13*. https://www.dol.gov/sites/dolgov/files/ETA/naws/pdfs/NAWS_Research_Report_13.pdf

[46] Human Rights Watch. (2021). *Essential and expendable: U.S. food workers in the pandemic*.

[47] Taylor, C.A., Boulos, C., & Almond, D. (2020). Livestock plants and COVID-19 transmission. *PNAS, 117*(50), 31706-31715. https://doi.org/10.1073/pnas.2010115117

[48] U.S. House Select Subcommittee on the Coronavirus Crisis. (2021). *COVID-19 outbreaks in meatpacking plants*.

[49] Grabell, M. (2022, May 13). *The Plot to Keep Meatpacking Plants Open During COVID-19*. ProPublica. https://www.propublica.org/article/documents-covid-meatpacking-tyson-smithfield-trump

[50] Cabrera-Lomeli, C. (2022). *Blacklisted for Speaking Up: How California Farmworkers Fighting Abuses Are Vulnerable to Retaliation*. KQED. https://www.kqed.org/news/11918317/blacklisted-for-speaking-up-how-california-farmworkers-fighting-abuses-are-vulnerable-to-retaliation

[51] Montalvo, R. (2024, August 1). *As California confronts the dangers of extreme heat, its main worker safety agency hasn't returned to its pre-pandemic level of inspections*. CalMatters. https://calmatters.org

[52] USDA Economic Research Service. (2023). *Household food security in the United States in 2023*. http://www.ers.usda.gov/publications/pub-details?pubid=109895

[53] Feeding America. (2023). *Map the Meal Gap*. https://www.feedingamerica.org/sites/default/files/2023-05/Map%20the%20Meal%20Gap%202023.pdf

[54] Feeding America.(2025). *Feeding America's 'Map the Meal Gap' reveals stark disparities in rural child hunger.* https://www.multivu.com/feeding_america/9266151-en-feeding-america-map-the-meal-gap-reveals-stark-disparities

[55] Center on Budget and Policy Priorities. (2023). *Food Insecurity Increased in 2022, With Severe Impact on Households With Children and Ongoing Racial Inequities.*https://www.cbpp.org/blog/food-insecurity-increased-in-2022-with-severe-impact-on-households-with-children-and-ongoing

[56] Farm Action. (2025, Nov. 18.) *Grocery Retail: The Last Link in the Monopoly Chain.* https://farmaction.us/grocery-retail-the-last-link-in-the-monopoly-chain/.

[57] OpenSecrets. (2022). *Agricultural lobbying*. https://www.opensecrets.org/industries/lobbying?cycle=2022&ind=A

[58] OpenSecrets. (2023). *Agribusiness top contributors. https://www.opensecrets.org/industries/contrib?cycle=2024&ind=A*

[59] American Farm Bureau Federation. (n.d.). *Waters of the United States*. https://www.fb.org/issue/regulatory-reform/waters-of-the-united-states

[60] American Farm Bureau Federation. (n.d.). *Labor.* https://www.fb.org/topic/labor

[61] Legis1. (2026, Feb. 1). *CropLife America Ramps Up Lobbying on Pesticide Liability*. https://legis1.com/news/pesticide-liability-lobbying-croplife/

[62] DeSmog. (n.d.). *National Cattlemen's Beef Association (NCBA)*. https://www.desmog.com/national-cattlemens-beef-association/

[63] Goswami, O. and Stillerman, K.. (2024). *Cultivating Control: Corporate Lobbying on the Food and Farm Bill.* Union of Concerned Scientists. https://www.ucs.org/resources/cultivating-control

[64] Animal Welfare Institute. (n.d.). *Inhumane Practices on Factory Farms*. https://awionline.org/content/inhumane-practices-factory-farms

[65] Sentient Media (2019). *99% of U.S. farmed animals live in factory farms*. https://sentientmedia.org/u-s-farmed-animals-live-on-factory-farms/

[66] Compassion in World Farming. (2024). *Pig Track*. https://www.ciwf.com/media/7459490/ciwf-pigtrack-report.pdf

[67] California Department of Food and Agriculture. (2020). *Proposition 12*. https://www.cdfa.ca.gov/ahfss/pdfs/regulations/LAO-Prop12.pdf

[68] Supreme Court of the United States. (2023). *National Pork Producers Council v. Ross*.

[69] Lake Forest College. (2017). *Animal welfare legislation and standards for farmed animals: The lack thereof*. https://www.lakeforest.edu/news/animal-welfare-legislation-and-standards-for-farmed-animals-the-lack-thereof

[70] USDA Food Safety and Inspection Service. (2026). *Humane Handling*. https://www.fsis.usda.gov/inspection/compliance-guidance/humane-handling

[71] Stevenson, P. (2023). Links between industrial livestock production, disease including zoonoses and antimicrobial resistance. *Animal Research and One Health, 1*(1), 137–144. https://doi.org/10.1002/aro2.19

[72] Rosenberg, B. (2024, November 13). *Growing use of antibiotics in factory-farmed animals threatens life-saving medications.* Environmental Working Group. https://www.ewg.org/news-insights/news/2024/11/life-saving-antibiotics-jeopardy-growing-use-factory-farmed-animals

[73] Millstein, S. (2024). *How the Meat Industry Shapes U.S. Politics (and Vice-Versa).* Sentient Media. https://sentientmedia.org/meat-industry-us-politics/

[74] Douglas, L. (2025, April 1). *USDA offer staff buyouts, according to email, as Trump slashes workforce.* USA Today. https://www.usatoday.com/story/news/politics/2025/04/01/usda-buyouts-trump-musk-doge/82755577007/

[75] Reilly, S. (2025, April 22). *Hundreds of EPA employees face layoffs or transfers.* E&E News by Politico. https://www.eenews.net/articles/hundreds-of-epa-employees-face-layoffs-or-transfers/

[76] Stein, R., Noguchi, Y., Lupkin, S., Eisner, C., Simmons-Duffin, S., & Worth, C. (2025, April 5). *'Your RIF notice is not cancelled.' Inside a chaotic week of mass layoffs at HHS.* National Public Radio. https://www.npr.org/sections/shots-health-news/2025/04/05/g-s1-58312/hhs-layoffs-rif-cdc-fda-nih

[77] Hardy, K. (2025, April 6). *USDA cuts hit small farms as Trump showers billions on big farms.* Washington State Standard. https://washingtonstatestandard.com/2025/04/06/usda-cuts-hit-small-farms-as-trump-showers-billions-on-big-farms/

[78] Douglas, L., Huffstutter, P.J., & Hickman, R. (2025, March 25). *USDA cuts hit food banks, risking hunger for low-income Americans.* Reuters. https://www.reuters.com/world/us/trump-cuts-hit-struggling-food-banks-risking-hunger-low-income-americans-2025-03-25/

[79] National Sustainable Agriculture Coalition. (2025, February 26). *Broken promises: Over 30,000 farmers denied funds.* NSAC's Blog. https://sustainableagriculture.net/blog/trump-denies-over-2-billion-in-payments-owed-to-30000-farmers/

[80] Monke, J., & Johnson, R. (2024, December 27). *Farm bill primer: Background and status.* Congressional Research Service. https://www.congress.gov/crs-product/IF12047

[81] Starmer, Elanor and Wise, Timothy A. (2007). Feeding at the Trough: Industrial Livestock Firms Saved $35 billion from Low Feed Prices. GDAE Policy Brief 07-03. Medford, Mass.: Global Development and Environment Institute. Tufts University, December 2007.

[82] *Ibid.*

[83] *Ibid.*

[84] Agriculture Improvement Act of 2018, Pub. L. No. 115-334 (2018), https://www.govinfo.gov/app/details/PLAW-115publ334

[85] Farm Action. (2022, August 4). *Putting our money where our mouths should be: The great contradiction between U.S. food subsidies and dietary guidelines.* https://farmaction.us/2022/08/04/putting-our-money-where-our-mouths-should-be-the-great-contradiction-between-u-s-food-subsidies-and-dietary-guidelines/

[86] USDA. (n.d.). *FY 2025 budget summary.* U.S. Department of Agriculture. https://www.usda.gov/sites/default/files/documents/2025-usda-budget-summary.pdf

[87] Cueto, Isabella and Todd, Sarah. (2026, Jan. 7). *Panel behind new dietary guidelines had financial ties to beef, dairy industries*. STAT. https://www.statnews.com/2026/01/07/new-dietary-guidelines-review-panel-financial-ties-beef-dairy-industry/

[88] Kelly, L. (2024). *Sustainability in the Dietary Guidelines for Americans: Influence on government policies and programs.* Center for Biological Diversity. https://www.biologicaldiversity.org/programs/population_and_sustainability/pdfs/sustainability-in-the-dietary-guidelines-for-america-analysis-2024.pdf

[89] Hickerson, A. (2024, August 22). *How US dietary recommendations have changed over the last 50 years.* Northwell Health. https://www.northwell.edu/news/the-latest/us-dietary-recommendations-changes-last-50-years

[90] Tirado-von der Pahlen, C. (2017). *Sustainable diets for healthy people and a healthy planet.* United Nations System Standing

Committee on Nutrition. https://www.unscn.org/uploads/web/news/document/Climate-Nutrition-Paper-EN-WEB.pdf

[91] Rifkin, M. (2023, September). *U.S. lags behind other G20 nations at adding sustainability into dietary guidelines.* Center for Biological Diversity. https://www.biologicaldiversity.org/programs/population_and_sustainability/pdfs/g20-dietary-guidelines-analysis.pdf

[92] 2025 Dietary Guidelines Advisory Committee. (2024). *Scientific report of the 2025 dietary guidelines advisory committee.* U.S. Department of Health and Human Services and U.S. Department of Agriculture. https://www.dietaryguidelines.gov/sites/default/files/2024-12/Scientific_Report_of_the_2025_Dietary_Guidelines_Advisory_Committee_508c.pdf

[93] Open Secrets. (n.d.). *Agribusiness lobbying*. https://www.opensecrets.org/industries/lobbying?ind=A

[94] Hanrahan, R. (2024, May 15). *Farm bill lobbying exceeds $500 million, report says.* Farm Policy News. https://farmpolicynews.illinois.edu/2024/05/farm-bill-lobbying-exceeds-500-million-report-says/

[95] Milstein, S. (2024, December 16). *How revolving door politics corrupts food systems.* Sentient Media. https://sentientmedia.org/revolving-door-politics-corrupt-food-systems/

[96] Environmental Working Group. (2023). *The United States farm subsidy breakdown, 2023.* https://farm.ewg.org/region.php?fips=00000&progcode=total&yr=2023

[97] Shanker, D. (2015, October 22). The US meat industry's wildly successful, 40-year crusade to keep its hold on the American diet. https://qz.com/523255/the-us-meat-industrys-wildly-successful-40-year-crusade-to-keep-its-hold-on-the-american-diet

[98] Environmental Working Group. (2023). *Commodity subsidies in the United States totaled $278.8 billion from 1995-2023.* https://farm.ewg.org/progdetail.php?fips=00000&progcode=totalfarm&page=conc&regionname=theUnitedStates

[99] USDA NASS. (2022). *2022 census of agriculture highlights: Farm economics*. https://www.nass.usda.gov/Publications/Highlights/2024/Census22_HL_FarmEconomics_FINAL.pdf

[100] USDA NASS. (2022). *2022 census of agriculture highlights: Farms and farmland*. https://www.nass.usda.gov/Publications/Highlights/2024/Census22_HL_FarmsFarmland.pdf

[101] Baur, G. (201, June 13). *Dairy industry has been milked for far too long.* Burlington County Times. https://www.burlingtoncountytimes.com/story/opinion/columns/your-voice/2019/06/13/dairy-industry-has-been-milked/4918149007/

[102] Environmental Working Group. (n.d.). *Share of total indemnities by crop, 1995-2023.* https://farm.ewg.org/cropinsurance.php?fips=00000&summpage=IN_BY_CROP&regionname=theUnitedStates

[103] McCrimmon, R. (2021, July 28). *USDA to pay farmers who euthanized animals amid meat plant shutdowns.* https://www.politico.com/news/2021/07/28/usda-to-pay-farmers-who-euthanized-animals-amid-meat-plant-shutdowns-501271

[104] Schechinger, A. (2022, September 28). *New EWG analysis: Of $7.4B spent on two of USDA's biggest conservation programs in recent years, very little went to 'climate-smart' agriculture.* Environmental Working Group. https://www.ewg.org/research/new-ewg-analysis-74b-spent-two-usdas-biggest-conservation-programs-recent-years-very

[105] Deese, B., Fazili, S., & Ramamurti, B. (2021, September 8). *Addressing concentration in the meat-processing industry to lower food prices for American families.* The White House. https://www.whitehouse.gov/briefing-room/blog/2021/09/08/addressing-concentration-in-the-meat-processing-industry-to-lower-food-prices-for-american-families/

[106] Anthis, J.R. (2019, April 11). *US factory farming estimates.* Sentience Institute. https://www.sentienceinstitute.org/us-factory-farming-estimates

[107] Environment America. (202, June 3). *Slaughterhouses are polluting our waterways.* https://environmentamerica.org/center/resources/slaughterhouses-are-polluting-our-waterways-2020/

[108] Domingo, N.G.G., Balasubramanian, D., Thakrar, S.K., Clark, M.A., Adams, P.J., Marshall, J.D., Muller, N.Z., Pandis, S.N., Polasky, S., Robinson, A.L., Tessum, C.W., Tilman, D., Tschofen, P., & Hill, J.D. (2021). Air quality–related health damages of food. *PNAS, 118*(20), e2013637118. https://doi.org/10.1073/pnas.2013637118

[109] Donham, K. J., Wing, S., Osterberg, D., Flora, J. L., Hodne, C., Thu, K. M., & Thorne, P. S. (2007). Community health and socioeconomic issues surrounding concentrated animal feeding operations. *Environmental health perspectives, 115*(2), 317-320. https://doi-org.proxy1.library.jhu.edu/10.1289/ehp.8836

[110] Copeland, C. (2016). *Clean Water Act: A summary of the law.* Congressional Research Service. https://sgp.fas.org/crs/misc/RL30030.pdf

[111] U.S. EPA. (n.d.). *Animal feeding operations (AFOs).* https://www.epa.gov/npdes/animal-feeding-operations-afos

[112] 33 U.S.C. § 1362(14).

[113] U.S. EPA. (n.d.). *Laws and regulations that apply to your agricultural operation by statute.* https://www.epa.gov/agriculture/laws-and-regulations-apply-your-agricultural-operation-statute

[114] Nat'l Pork Producers Council v. U.S. EPA, 635 F.3d 738, 750-51 (5th Cir. 2011).

[115] U.S. EPA. (2023, May 14). *NPDES CAFO permitting status report: National summary, endyear 2023, completed 14 May 2024.* https://www.epa.gov/system/files/documents/2024-06/cafo-status-report-2023.pdf

[116] 73 Fed. Reg. at 70,469

[117] Petitioners' Opening Brief, Food & Water Watch v. EPA, No. 23-2146 (9th Cir. Feb. 26, 2024). https://www.foodandwaterwatch.org/wp-content/uploads/2024/02/2024.2.26-Opening-Brief.pdf

[118] *Ibid.*

[119] Petition for a Writ of Mandamus to Compel Unreasonably Delayed Action by the Environmental Protection Agency, Food & Water Watch, Inc. v. EPA, No. __ (9th Cir. Oct. 7, 2022). https://environmentalintegrity.org/wp-content/uploads/2022/10/2022.10.7-Petition-for-

Writ-of-Mandamus.pdf

[120] Ward, A.S. (2023, June 15). *Here's what the Supreme Court's Clean Water Act ruling means to you.* Scientific American. https://www.scientificamerican.com/article/heres-what-the-supreme-courts-clean-water-act-ruling-means-to-you/

[121] Sherman, M. (2025, March 4). *Supreme Court rules 5-4 against EPA in water pollution case.* TIME. https://time.com/7264345/supreme-court-rules-against-epa-water-pollution-case/

[122] U.S. National Science Foundation. (2022, November 2). *As winters warm, nutrient pollution threatens 40% of U.S.* https://www.nsf.gov/news/winters-warm-nutrient-pollution-threatens-40-us

[123] Lattanzio, R.K. (2022). *Clean Air Act: A summary of the act and its major requirements.* Congressional Research Service. https://www.congress.gov/crs-product/RL30853

[124] U.S. EPA. (n.d.). *Laws and regulations that apply to your agricultural operation by statute.* https://www.epa.gov/agriculture/laws-and-regulations-apply-your-agricultural-operation-statute

[125] Center for Biological Diversity. (2021, October 26). *Legal petition challenges EPA inaction on factory farm air pollution* [Press release]. https://biologicaldiversity.org/w/news/press-releases/legal-petition-challenges-epa-inaction-on-factory-farm-air-pollution-2021-10-26/

[126] Center for Biological Diversity. (2023, September 28). *Lawsuit challenges EPA's failure to address dangerous nitrogen air pollution* [Press release]. https://biologicaldiversity.org/w/news/press-releases/lawsuit-challenges-epas-failure-to-address-dangerous-nitrogen-air-pollution-2023-09-28/

[127] Sherman, S. (2022, June 30). *Supreme Court limits EPA in curbing power plant emissions.* Associated Press. https://apnews.com/article/supreme-court-epa-ruling-2e893673819a1b6c6aa272a5e814f0b0

[128] Sherman, M. (2024, June 27). *Supreme Court halts enforcement of the EPA's plan to limit downwind pollution from power plants.* Associated Press. https://apnews.com/article/supreme-court-epa-good-neighbor-air-pollution-6665ba500aa2abb797bd9704e014909c

[129] U.S. EPA. (2026, February 18). *Final rule: Rescission of the greenhouse gas endangerment finding and motor vehicle greenhouse gas emission standards under the Clean Air Act.* https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-rescission-greenhouse-gas-endangerment

[130] Federal Meat Inspection Act, 21 U.S.C. § 601 et seq. (1906). https://uscode.house.gov/view.xhtml?path=/prelim@title21/chapter12&edition=prelim

[131] Poultry Products Inspection Act, 21 U.S.C. § 451 et seq. (1957). https://uscode.house.gov/view.xhtml?path=/prelim@title21/chapter10&edition=prelim

[132] Egg Products Inspection Act, 21 U.S.C. § 1031 et seq. (1970). https://uscode.house.gov/view.xhtml?path=/prelim@title21/chapter15&edition=prelim

[133] Food Manufacturing. (2019, September 30). *Critics uneasy as federal meat inspectors face overload.* https://www.foodmanufacturing.com/home/news/21101337/critics-uneasy-as-federal-meat-inspectors-face-overload

[134] Nebeker, R. (2025, May 8). *What do faster line speeds in slaughterhouses mean for animals, workers and food safety?* FoodPrint. https://foodprint.org/blog/line-speeds/

[135] Packers and Stockyards Act, 7 U.S.C. § 181 et seq. (1921). https://uscode.house.gov/view.xhtml?edition=prelim&path=%2Fprelim%40title7%2Fchapter9&req=granuleid%3AUSC-prelim-title7-chapter9&num=0&hl=false

[136] Farm Action. (n.d.). *Strengthening the Packers and Stockyards Act.* https://farmaction.us/ps-act-reform/

[137] Twenty-Eight Hour Law, 49 U.S.C. § 80502 (1873). https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title49-section80502&num=0&edition=prelim#sourcecredit

[138] Humane Methods of Slaughter Act, 7 U.S.C. § 1901 et seq. (1958). https://uscode.house.gov/view.xhtml?path=/prelim@title7/chapter48&edition=prelim

[139] Animal Welfare Institute. (2020). *Humane slaughter update.* https://awionline.org/sites/default/files/uploads/documents/20HumaneSlaughterUpdate.pdf

[140] Animal Welfare Institute. (n.d.). *A review: The Twenty-Eight Hour Law and its enforcement.* https://awionline.org/sites/default/files/uploads/documents/22-Twenty-Eight-Hour-Law-Report.pdf

[141] ASPCA. (n.d.). *Farm animal confinement bans by state.* https://www.aspca.org/improving-laws-animals/public-policy/farm-animal-confinement-bans

[142] Animal Welfare Institute. (2022). *Legal protections for animals on farms.* https://awionline.org/sites/default/files/uploads/documents/22-Legal-Protections-Farm.pdf

[143] SCOTUSblog. (n.d.). *National pork producers council v. Ross.* (https://www.scotusblog.com/case-files/cases/national-pork-producers-council-v-ross/

[144] ASPCA. *Factory farm / CAFO moratoriums.* https://www.aspca.org/improving-laws-animals/public-policy/cafo-moratoriums

[145] ASPCA. (n.d.). *What is ag-gag legislation?* https://www.aspca.org/improving-laws-animals/public-policy/what-ag-gag-legislation

[146] *Ibid.*

[147] *Ibid.*

[148] National Labor Relations Board. (n.d.). *About NLRB: Are you covered?* https://www.nlrb.gov/about-nlrb/rights-we-protect/the-law/employees/are-you-covered

[149] National Labor Relations Board. (n.d.). *Guidance: National labor relations act.* https://www.nlrb.gov/guidance/key-reference-materials/national-labor-relations-act

[150] Wage and Hour Division. (2025, January*). Fact sheet #12: Agricultural employment under the Fair Labor Standards Act (FLSA).* U.S. Department of Labor. https://www.dol.gov/agencies/whd/fact-sheets/12-agricultural-employment-flsa.

[151] *Ibid.*

[152] Baker, D.E., & Milhollin, R. (2021, January). *Agriculture and the Occupational Safety and Health Act.* University of Missouri Extension. https://extension.missouri.edu/publications/g1961

[153] USDA. (2024, February). *2022 census of agriculture: United States summary and state data (AC-22-A-51).* https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_US/usv1.pdf

[154] Gubernot, D. M., Anderson, G. B., & Hunting, K. L. (2015). Characterizing occupational heat-related mortality in the United States, 2000-2010: an analysis using the Census of Fatal Occupational Injuries database. *American journal of industrial medicine*, *58*(2), 203–211. https://doi.org/10.1002/ajim.22381

[155] Becerra, N.R. (2023, October 13). *Impacts of the Climate Crisis on Farmworkers.* American Lung Association. https://www.lung.org/blog/climate-change-impacts-farmworkers

[156] University of Washington. (2018). *Mattawa Farmworkers' Under the Smoke* .Pacific Northwest Agricultural Safety and Health Center. https://deohs.washington.edu/pnash/sites/deohs.washington.edu.pnash/files/WildfireSmoke-2018-sf.pdf

[157] United Nations. (1948). *Universal Declaration of Human Rights*. https://www.un.org/en/about-us/universal-declaration-of-human-rights

[158] FNS. (n.d.). *Child nutrition programs legislation and regulations.* U.S. Department of Agriculture. https://www.fns.usda.gov/cn/legislation-regulations

[159] Aussenberg, R.A., & Clifford, K. (2024, July 15). *Child nutrition reauthorization (CNR): An overview.* Congressional Research Service. https://www.congress.gov/crs-product/IF10266

[160] USASpending.gov. (n.d.). *Spending explorer: FY 2023: Department of Agriculture.* https://www.usaspending.gov/explorer/agency

[161] USDA FNS. (2024, April). *Program information report (keydata): U.S. summary, FY 2023 – FY 2024.* https://fns-prod.azureedge.us/sites/default/files/data-files/keydata-april-2024.pdf

[162] Dietary Guidelines Advisory Committee. (2020). *Scientific Report of the 2025 Guidelines Advisory Committee.* https://www.dietaryguidelines.gov/2025-advisory-committee-report

[163] Vatavuk-Serrati, G., Meyer, K., & Taillie, L. S. (2024). Trends in the Prevalence of Foods High in Saturated Fats, Sodium, and Sugar in the U.S. Diet, NHANES 2007-2018. *Current Developments in Nutrition, 8.* https://doi.org/10.1016/j.cdnut.2024.102748

[164] Martínez Steele, E., Baraldi, L. G., Louzada, M. L., Moubarac, J. C., Mozaffarian, D., & Monteiro, C. A. (2016). Ultra-processed foods and added sugars in the US diet: evidence from a nationally representative cross-sectional study. *BMJ open, 6*(3), e009892. https://doi.org/10.1136/bmjopen-2015-009892

[165] CDC. (2022). *National Center for Health Statistics, National Vital Statistics System, mortality data file.* https://www.cdc.gov/nchs/nvss/deaths.htm

[166] U.S. Department of Agriculture (USDA), Agricultural Research Service. (2024). Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Male/Female and Age, *What We Eat in America*, NHANES August 2021-August 2023. https://www.ars.usda.gov/ARSUserFiles/80400530/pdf/2123/tables_1-36%20and%2041-56_2123.pdf

[167] Our World in Data. (2026). *Data Page: Daily per capita supply of all meat*. Data adapted from Food and Agriculture Organization of the United Nations. https://ourworldindata.org/grapher/daily-meat-consumption-per-person?tab=table

[168] Zeng L, Ruan M, Liu J, Wilde P, Naumova EN, Mozaffarian D, Zhang FF. (2019). Trends in Processed Meat, Unprocessed Red Meat, Poultry, and Fish Consumption in the United States, 1999-2016. *J Acad Nutr Diet*. *119*(7), 1085-1098.e12. https:/www.doi.org/10.1016/j.jand.2019.04.004.

[169] U.S. Department of Agriculture (USDA), Agricultural Research Service. (2024). Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Male/Female and Age, *What We Eat in America*, NHANES August 2021-August 2023. https://www.ars.usda.gov/ARSUserFiles/80400530/pdf/2123/tables_1-36%20and%2041-56_2123.pdf

[170] Micha R, Michas G, & Mozaffarian D. (2012). Unprocessed red and processed meats and risk of coronary artery disease and type 2 diabetes–an updated review of the evidence. *Current atherosclerosis reports.* 14(6), 515-524.

[171] Pan A, Sun Q, Bernstein AM, Schulze MB, Manson JE, Stampfer MJ, Willett WC, Hu FB. (2012). Red meat consumption and mortality: results from 2 prospective cohort studies. *Arch Intern Med.*, 172(7):555-63. doi: 10.1001/archinternmed.2011.2287.

[172] Zhao B, Gan L, Graubard BI, Männistö S, Fang F, Weinstein S J, et al. (2024). Plant and Animal Fat Intake and Overall and Cardiovascular Disease Mortality. *JAMA Internal Medicine*. DOI: 10.1001/jamainternmed.2024.3799

[173] Kaluza J, Wolk A, Larsson SC. (2012). Red meat consumption and risk of stroke: a meta-analysis of prospective studies. *Stroke*, 43(10):2556-60. doi: 10.1161/STROKEAHA.112

[174] Micha R, Michas G, & Mozaffarian D. Unprocessed red and processed meats and risk of coronary artery disease and type 2 diabetes–an updated review of the evidence. *Current atherosclerosis reports.* 2012, 14(6), 515-524..663286.

[175] Micha R, Michas G, & Mozaffarian D. (2012). Unprocessed red and processed meats and risk of coronary artery disease and type 2 diabetes–an updated review of the evidence. *Current atherosclerosis reports,* 14(6), 515-524.

[176] Pan A, Sun Q, Bernstein AM, Schulze MB, Manson JE, Willett WC, Hu FB. (2011). Red meat consumption and risk of type 2

diabetes: 3 cohorts of US adults and an updated meta-analysis. *Am J Clin Nutr*., 94(4):1088-96. doi: 10.3945/ajcn.111.018978

[177] Qian F, Riddle MC, Wylie-Rosett J, Hu FB. (2020). Red and Processed Meats and Health Risks: How Strong Is the Evidence? *Diabetes Care*, 43 (2): 265–271. https://doi.org/10.2337/dci19-0063

[178] Vergnaud AC, Norat T, Romaguera D, Mouw T, May AM, Travier N, et. al. (2010). Meat consumption and prospective weight change in participants of the EPIC-PANACEA study. *Am J Clin Nutr*., 92(2):398-407. doi: 10.3945/ajcn.2009.28713.

[179] Pan A, Sun Q, Bernstein AM, Schulze MB, Manson JE, Stampfer MJ, Willett WC, Hu FB. (2012). Red meat consumption and mortality: results from 2 prospective cohort studies. *Arch Intern Med*., 172(7):555-63. doi: 10.1001/archinternmed.2011.2287.

[180] Händel MN, Rohde JF, Jacobsen R, et al. (2020). Processed meat intake and incidence of colorectal cancer: a systematic review and meta-analysis of prospective observational studies. *Eur J Clin Nutr* 74, 1132–1148. https://doi.org/10.1038/s41430-020-0576-9

[181] Sinha R, Cross AJ, Graubard BI, Leitzmann MF, Schatzkin A. (2009). Meat intake and mortality: a prospective study of over half a million people. *Arch Intern Med*., 169(6):562-71. doi: 10.1001/archinternmed.2009.6. PMID: 19307518; PMCID: PMC2803089.

[182] Zhong VW, Van Horn L, Greenland P, Carnethon MR, Ning H, Wilkins JT, Lloyd-Jones DM, Allen NB. (2020). Associations of Processed Meat, Unprocessed Red Meat, Poultry, or Fish Intake With Incident Cardiovascular Disease and All-Cause Mortality. *JAMA Intern Med*., 180(4):503-512. doi: 10.1001/jamainternmed.2019.6969.

[183] Bovard V, Bouvard V, Loomis D, et al. (2015). Carcinogenicity of consumption of red and processed meat. *Lancet Oncol*., 16(16):1599-1600.

[184] Alisson-Silva F, Kawanishi K, Varki A. (2016). Human risk of diseases associated with red meat intake: analysis of current theories and proposed role for metabolic incorporation of a non-human sialic acid. *Mol Aspects Med*.51:16-30. doi:10.1016/j.mam.2016.07.002

[185] Wang M, Wang Z, Lee Y, Lai HTM, de Oliveira Otto MC, Lemaitre RN, et al. *Arteriosclerosis, Thrombosis, and V, ascular Biology* Vol. 42 Issue 9 ATVBAHA.121.316533 https://doi.org/10.1161/ATVBAHA.121.316533

[186] You W, Henneberg M. (2016). Meat consumption providing a surplus energy in modern diet contributes to obesity prevalence: an ecological analysis. *BMC Nutrition*, 2(1), 22.

[187] Bhandari B, Liu Z, Lin S, Macniven R, Akombi-Inyang B, Hall J, et al. (2023). Long-term consumption of 10 food groups and cardiovascular mortality: a systematic review and dose-response meta-analysis of prospective cohort studies. *Adv Nutr*., 14(1):55-63. doi:10.1016/j.advnut.2022.10.010

[188] Neuenschwander M, Stadelmaier J, Eble J, Grummich K, Szczerba E, Kiesswetter E, et al. (2023). Substitution of animal-based with plant-based foods on cardiometabolic health and all-cause mortality: a systematic review and meta-analysis of prospective studies, *BMC Medicine*, Vol. 21 Issue 1 Pages 404, DOI: 10.1186/s12916-023-03093-1

[189] Capodici A, Mocciaro G, Gori D, Landry MJ, Masini A, Sanmarchi F, et al. (2024). Cardiovascular health and cancer risk associated with plant-based diets: an umbrella review. *PLoS One*., 19(5):e0300711. doi:10.1371/journal.pone.0300711

[190] Sullivan VK, Martínez-Steele E, Garcia-Larsen V and Rebholz C M. (2020). Trends in Plant-Based Diets among United States Adults, 1999-March 2020. *J Nutr*., Accession Number: 39128546 DOI: 10.1016/j.tjnut.2024.08.004 https://www.sciencedirect.com/science/article/pii/S0022316624004553

[191] Santo RE, Kim BF, Goldman SE, Dutkiewicz J, Biehl EMB, Bloem MW, et al. (2020). Considering Plant-Based Meat Substitutes and Cell-Based Meats: A Public Health and Food Systems Perspective. *Frontiers in Sustainable Food Systems*, Vol. 4 Issue 134; DOI: 10.3389/fsufs.2020.00134

[192] State of the Industry: Plant-based meat, seafood, eggs, dairy, and ingredients | GFI. (2025, April 25). The Good Food Institute. https://gfi.org/resource/plant-based-meat-eggs-and-dairy-state-of-the-industry/

[193] Toh DWK, Srv A, Henry CJ. Unknown impacts of plant-based meat alternatives on long-term health. (2022). *Nat Food*., 3(2):90-91. doi: 10.1038/s43016-022-00463-5

[194] Crimarco A, Springfield S, Petlura C, Streaty T, Cunanan K, Lee J, et al. (2020). A randomized crossover trial on the effect of plant-based compared with animal-based meat on trimethylamine-N-oxide and cardiovascular disease risk factors in generally healthy adults: Study With Appetizing Plantfood—Meat Eating Alternative Trial (SWAP-MEAT) *Am J Clin Nutr*; Vol. 112 Issue 5 Pages 1188-1199 DOI: 10.1093/ajcn/nqaa203

[195] Sullivan VK, Martínez-Steele E, Garcia-Larsen V and Rebholz C M. (2024).Trends in Plant-Based Diets among United States Adults, 1999-March 2020. *J Nutr*., Accession Number: 39128546 DOI: 10.1016/j.tjnut.2024.08.004

[196] Santo RE, Kim BF, Goldman SE, Dutkiewicz J, Biehl EMB, Bloem MW, et al. (2020). Considering Plant-Based Meat Substitutes and Cell-Based Meats: A Public Health and Food Systems Perspective. *Frontiers in Sustainable Food Systems*, Vol. 4 Issue 134; DOI: 10.3389/fsufs.2020.00134

[197] Brandt, E. J., Leung, C. W., Chang, T., Ayanian, J. Z., Banerjee, M., Kirch, M., Mozaffarian, D., & Nallamothu, B. K. (2025). Differences in United States Adult Dietary Patterns by Cardiometabolic Health and Socioeconomic Vulnerability. The Journal of Nutrition, 155(8), 2685–2699. https://doi.org/10.1016/j.tjnut.2025.06.002

[198] USDA Economic Research Service. (2022). *Low-income and low-access food data*.

[199] USDA ERS. (2025). *Food access research atlas*. http://www.ers.usda.gov/data-products/food-access-research-atlas

[200] USDA ERS. (2022). *Food security in the United States*. http://www.ers.usda.gov/publications/pub-details?pubid=107702

[201] Jacobson, M. F., Krieger, J., & Brownell, K. D. (2018). Potential Policy Approaches to Address Diet-Related Diseases. *JAMA*, *320*(4), 341–342. https://doi.org/10.1001/jama.2018.7434

[202] Chung, H., Cullerton, K., & Lacy-Nichols, J. (2024). Mapping the Lobbying Footprint of Harmful Industries: 23 Years of Data From

OpenSecrets. *The Milbank quarterly*, *102*(1), 212–232. https://doi.org/10.1111/1468-0009.12686

[203] Make America Healthy Again Commission. (2025). *Make Our Children Healthy Again Assessment*. https://www.whitehouse.gov/wp-content/uploads/2025/05/MAHA-Report-The-White-House.pdf

[204] Make America Healthy Again Commission. (2025.) *Make Our Children Healthy Again Strategy Report*. https://www.whitehouse.gov/wp-content/uploads/2025/09/The-MAHA-Strategy-WH.pdf

[205] Wen, Leana. (2025, Sept. 12.) *Anyone who bought RFK Jr.'s hype should read this report.* The Washington Post. https://www.washingtonpost.com/opinions/2025/09/12/kennedy-maha-report-health-vaccines/

[206] Good Food Institute. (2023.) *Environmental benefits of alternative proteins. https://gfi.org/wp-content/uploads/2024/02/Environmental-benefits-of-alternative-proteins-Dec-2023.pdf*

[207] Xu et al. (2021). *Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods.* Nature Food. https://www.nature.com/articles/s43016-021-00358-x

[208] World Business Council for Sustainable Development. (2024). *Alternative proteins: essential for restoring nature in the US and beyond.* https://www.wbcsd.org/news/alternative-proteins-essential-for-restoring-nature-in-the-us-and-beyond/

[209] *Ibid.*

[210] Searchinger et al. (2019). *Creating a Sustainable Food Future.* World Resources Institute. https://www.wri.org/research/creating-sustainable-food-future

[211] *Ibid.*

[212] Heller, M. C., & Keoleian, G. A. (2018). *Beyond Burger Life Cycle Assessment.* University of Michigan. http://css.umich.edu/sites/default/files/publication/CSS18-10.pdf

[213] *Ibid.*

[214] World Animal Protection. (2021). *Climate Change and Cruelty.* https://www.worldanimalprotection.org/globalassets/pdfs/reports/english/climate-change-and-cruelty.pdf

[215] *Ibid.*

[216] Shepon, A., Eshel, G., Noor, E., & Milo, R. (2016). Energy and protein feed-to-food conversion efficiencies in the US and potential food security gains from dietary changes. *Environmental Research Letters, 11*(10), 105002.

[217] Gerhardt, Dr. Carsten, et al. (n.d). *How Will Cultured Meat and Meat Alternatives Disrupt the Agricultural and Food Industry?* ATKearney. www.atkearney.com/retail/article/?/a/how-will-cultured-meat-and-meat-alternatives-disrupt-the-agricultural-and-food-industry

[218] ClimateWorks Foundation and the Global Methane Hub. (2023.) *Global Innovation Needs Assessments: Food System Methane.* https://www.climateworks.org/ginas-methane.

[219] Bonny et al. (2017). *Artificial meat and the future of the meat industry.* https://www.researchgate.net/publication/319910275_Artificial_meat_and_the_future_of_the_meat_industry

[220] *Ibid.*

[221] van der Weele & Tramper. (2014). *Cultured meat: Every village its own factory?* https://pubmed.ncbi.nlm.nih.gov/24856100/

[222] The Good Food Institute. *The nutritional profile of plant-based meat: strengths and opportunities.* https://gfi.org/science/the-nutritional-profile-of-plant-based-meat/

[223] OncoDaily. *Does Processed Meat Cause Cancer? Myths and Facts*.https://oncodaily.com/oncolibrary/does-processed-meat-cause-cancer

[224] Cleveland Clinic. *Here's How Fast Food Can Affect Your Body.* https://health.clevelandclinic.org/fast-food-effects-on-body

[225] The Good Food Institute. *Dietary fiber in plant-based meat products.* https://gfi.org/science/the-nutritional-profile-of-plant-based-meat/

[226] Nagra, M., Tsam, F., Ward, S., & Ur, E. (2024). *Animal vs plant-based meat: A hearty debate.* Canadian Journal of Cardiology, 40(7). https://doi.org/10.1016/j.cjca.2023.11.005

[227] Monteyne, A. J., et al. (2020). *Mycoprotein ingestion stimulates muscle protein synthesis to a greater extent than milk protein.* American Journal of Clinical Nutrition, 112(2), 318–327. https://academic.oup.com/ajcn/article/112/2/318/5840161

[228] Jackfruit Co. (n.d.). *Our Story.* https://thejackfruitcompany.com/our-story/

[229] Meati Foods. (n.d.). *The Deets*. https://www.meati.com/pages/what-is-meati

[230] Growing Cultivated Meat: microbiological activity in post-production, PMC Article, 2025, https://pmc.ncbi.nlm.nih.gov/articles/PMC11681928/.

[231] Craig Murray and colleagues, *Cultivated meat microbiological safety considerations and practices*, PubMed, 2025, https://pubmed.ncbi.nlm.nih.gov/39731713/.

[232] Alvarez, L. (n.d.). *Colonization, food, and the practice of eating.* Food Empowerment Project. https://foodispower.org/our-food-choices/colonization-food-and-the-practice-of-eating/.

[233] Ficek, R.E. (2019). Cattle, capital, and colonization: Tracking creatures of the Anthropocene in and out of human projects. *Current Anthropology, 60,* S260—S271. https://www.doi.org/10.1086/702788.

[234] *Ibid.*

[235] Pfeifer, J. (2019, May 9). *How America became the 'Red Meat Republic.'* Civil Eats. https://civileats.com/2019/05/09/how-america-

became-the-red-meat-republic/.

[236] Krasna, D. (2022). Animal colonialism in North America: Milk colonialism, environmental racism, and Indigenous veganism. *Studia Territorialia, 22*(1), 61—90. https://www.doi.org/10.14712/23363231.2022.9.

[237] Ficek, R.E. (2019). Cattle, capital, and colonization: Tracking creatures of the Anthropocene in and out of human projects. *Current Anthropology, 60,* S260—S271. https://www.doi.org/10.1086/702788.

[238] Ansari, S. (2021, May 27). *Factory farming's impacts on Indigenous populations*. New Roots Institute. https://www.newrootsinstitute.org/articles/factory-farming-indigenous.

[239] Son, J. Y., Miranda, M. L., & Bell, M. L. (2021). Exposure to concentrated animal feeding operations (CAFOs) and risk of mortality in North Carolina, USA. *Science of the Total Environment, 799,* 149407. https://doi.org/10.1016/j.scitotenv.2021.149407.

[240] Quist, A.J.L., Holcomb, D.A., Fliss, M.D., Delamater, P.L., Richardson, D.B., & Engel, L.S. (2022). Exposure to industrial hog operations and gastrointestinal illness in North Carolina, USA. *Science of the Total Environment, 15*(830), 154823. https://www.doi.org/10.1016/j.scitotenv.2022.154823.

[241] Schultz, A.A., Peppard, P., Gangnan, R.E., & Malecki, K.M.C. (2019). Residential proximity to concentrated animal feeding operations and allergic and respiratory disease. *Environment International, 130,* 104911. https://doi.org/10.1016/j.envint.2019.104911.

[242] Dennis, M.K., & Robin, T. (2020). Healthy on our own terms: Indigenous wellbeing and the colonized food system. *Journal of Critical Dietetics, 5*(1), 4—11. http://dx.doi.org/10.32920/cd.v5i1.1333.

[243] Minassian, L. (2021, February 3). Indigenous foods: How colonized diets have made Native nations sick – and what's being done about it. Food Revolution Network. https://foodrevolution.org/blog/indigenous-foods-systems-food-sovereignty/.

[244] Frank, L.E. (2020, November 30). *How Native American diets shifted after European colonization.* History. https://www.history.com/articles/native-american-food-shifts.

[245] Reuters. (2012, January 30). *"Spam" meat tied to diabetes risk in Native Americans: study.* https://www.reuters.com/article/us-spam/spam-meat-tied-to-diabetes-risk-in-native-americans-study-idUSTRE80U05F20120131/.

[246] Maillacheruvu, S.U. (2022, October 4). *The historical determinants of food insecurity in Native communities.* Center on Budget and Policy Priorities. https://www.cbpp.org/research/food-assistance/the-historical-determinants-of-food-insecurity-in-native-communities.

[247] National Indian Council on Aging. (n.d.). *Indigenous foods.* https://www.nicoa.org/elder-resources/indigenous-foods/.

[248] Smith, M., Rink, E., Held, S., Shanks, C.B., & Miles, M.P. (2020). The effects of foods available through the Food Distribution Program on Indian Reservations (FDPIR) on inflammation response, appetite and energy intake. *Public Health Nutrition, 24*(10), 3037—3048. https://doi.org/10.1017/S1368980020002852

[249] Vernon, R.V. (2015). A Native perspective: Food is more than consumption. *Journal of Agriculture, Food Systems, and Community Development, 5*(4), 137—142. http://dx.doi.org/10.5304/jafscd.2015.054.024

[250] Cote, C. (2016). "Indigenizing" food sovereignty. Revitalizing Indigenous food practices and ecological knowledges in Canada and the United States. *Humanities, 5*(3), 57. https://doi.org/10.3390/h5030057.

[251] European Coordination Via Campesina (n.d.). *Peasant Agroecology via ECVC*. https://www.eurovia.org/wp-content/uploads/2022/04/Agroecology_EN.pdf.

[252] Center for Biological Diversity (2025). *Regenerative Farming: Potential and Limitations.* https://biologicaldiversity.org/programs/population_and_sustainability/pdfs/regenerative-farming-guide-2025.pdf

[253] IPES-Food. (2022). Smoke and Mirrors: Examining competing framings of food system sustainability: agroecology, regenerative agriculture, and nature-based solutions. https://ipes-food.org/_img/upload/files/SmokeAndMirrors.pdf

[254] New Climate Institute. (2024). *Navigating regenerative agriculture in corporate climate strategies.* https://newclimate.org/resources/publications/navigating-regenerative-agriculture-in-corporate-climate-strategies.

[255] World Benchmarking Alliance. (2023). *2023 Food and Agriculture Benchmark and 2023 Nature Benchmark*. https://www.worldbenchmarkingalliance.org/research/2023-food-and-agriculture-and-nature-benchmark/.

[256] Kelly, Sharon (2020). *Regenerative Agriculture – Criticisms and Concerns.* DeSmog.https://www.desmog.com/2020/09/11/regenerative-agriculture-criticisms-and-concerns/

[257] Friends of the Earth (2025). *Rethinking No-Till*. https://foe.org/resources/rethinking-no-till/.

[258] Glowacki-Dudka, M., Murray, J., & Isaacs, K. P. (2013). Examining social capital within a local food system. *Community Development Journal*, *48*(1), 75-88.https://doi.org/10.1093/cdj/bss007

[259] University of Wisconsin Center for Cooperatives. (n.d.) *Cooperatives in the U.S. Economy.* https://reic.uwcc.wisc.edu/issues/

[260] Dash, B. M., Prashad, L., Singh, K. K., & Dash, M. (2020). Women and poverty in India: Poverty alleviation and empowerment through cooperatives. *Social Work & Society*, *18*(2).

[261] Ferguson, H., & Kepe, T. (2011). Agricultural cooperatives and social empowerment of women: a Ugandan case study. *Development in Practice*, *21*(3), 421-429.

[262] Vásquez-León, M. (2010). Walking the tightrope: Latin American agricultural cooperatives and small-farmer participation in global markets. *Latin American Perspectives*, *37*(6), 3-11.

[263] Ratner, C. (2009). Cooperativism: A social, economic, and political alternative to capitalism. *Capitalism Nature Socialism*, *20*(2), 44-73.

[264] U.S. Department of Agriculture (USDA). (2023). *USDA Local and Regional Food Systems Resource Guide*. USDA. https://www.ams.usda.gov/sites/default/files/media/LocalandRegionalFoodSystemResourceGuide.pdf

[265] Feenstra, G., & Campbell, D. C. (2019). Local and Regional Food Systems. In D. M. Kaplan, *Encyclopedia of Food and Agricultural Ethic* (pp. 1761–1768). Springer. https://doi.org/10.1007/978-94-024-1179-9_73

[266] The National Agricultural Law Center. (n.d.). *Local Food Systems: An Overview*. https://nationalaglawcenter.org/overview/local-food/

[267] Hendrickson, M., Massengale, S. H., & Weber, C. (2022, September). *Introduction to Local Food Systems*. University of Missouri Extension. Hendrickson, M., Massengale, S. H., & Weber, C. (2022, September). *Introduction to Local Food Systems*. University of Missouri Extension.

[268] USDA (2023).

[269] Feenstra (2019).

[270] Hendrickson (2022).

[271] Massey, A. (2015). *Building Local and Regional Food Systems* (Topic Room Series). Sustainable Agriculture Research and Education. https://www.sare.org/wp-content/uploads/Building-Local-and-Regional-Food-Systems.pdf

[272] USDA (2023).

[273] Hendrickson (2022).

[274] Massey (2015).

[275] USDA (2023).

[276] Feenstra (2019).

[277] Hendrickson (2022).

[278] Freedgood, J., & Fydenkevez, J. (2017). *Growing Local: A Community Guide to Planning for Agriculture and Food Systems*. Growing Food Connections; American Farmland Trust. https://farmlandinfo.org/wp-content/uploads/sites/2/2019/09/AFT_GFC_GROWING_LOCAL_Community_Guide_to-Planning_for_Agriculture_and_Food_Systems-_10-2017_web.pdf

[279] USDA (2023).

[280] The National Agricultural Law Center (n.d.)

[281] Hendrickson (2022).

[282] Feenstra (2019).

[283] Hendrickson (2022).

[284] Brinkmeyer, E., Dankbar, H., & Bloom, J. D. (2023, August 11). *Local Food Systems: Clarifying Current Research*. North Carolina Cooperative Extension. https://content.ces.ncsu.edu/local-food-systems-clarifying-current-research

[285] The National Agricultural Law Center (n.d.).

[286] Brinkmeyer (2023).

[287] Freedgood (2017).

[288] Gupta, C., Campbell, D., Munden-Dixon, K., Sowerwine, J., Capps, S., Feenstra, G., & Van Soelen Kim, J. (2018). Food Policy Councils and Local Governments: Creating Effective Collaboration for Food Systems Change. *Journal of Agriculture, Food Systems, and Community Development*, *8*(Suppl. 2), 11–28. https://doi.org/10.5304/jafscd.2018.08B.006

[289] Freedgood (2017).

[290] Schiff, R. (2008). The Role of Food Policy Councils in Developing Sustainable Food Systems. *Journal of Hunger & Environmental Nutrition*, *3*(2–3), 206–228. https://doi.org/10.1080/19320240802244017

[291] Muller, M., Tagtow, A., Roberts, S. L., & MacDougall, E. (2009). Aligning Food Systems Policies to Advance Public Health. *Journal of Hunger & Environmental Nutrition*, *4*, 225–240. https://doi.org/10.1080/19320240903321193

[292] Thompson, J. (n.d.). *What is food solutionism? And why does it limit us* (86) [Broadcast]. https://www.tabledebates.org/podcast/episode86

[293] Purifoy, D. M. (2024). Food Policy Councils: Integrating Food Justice and Environmental Justice. *Duke Environmental Law & Policy Forum*, *24*, 375–398.

[294] Johns Hopkins Center for a Livable Future. (n.d.). *Councils*. Food Policy Networks. https://foodpolicynetworks.org/councils

[295] Freedgood (2017).

[296] Schiff (2008).

[297] Gupta (2018).

[298] Schiff (2008).

[299] Schiff (2008).

[300] Muller (2009).

[301] Purifoy (2024).

[302] Thompson, J. (n.d.).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