

A photograph of an older man with grey hair, wearing a blue and white plaid shirt and grey trousers, standing in a vast field of green leafy plants. He is holding a small branch of the plant with both hands, looking down at it. The background shows a flat horizon under a soft, hazy sky.

HOW CAN PLANT-BASED DIETS SUPPORT GLOBAL FOOD SECURITY?

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WHY ARE WE FOCUSING ON FOOD SECURITY?

At The Vegan Society, we believe that a transition in the way humanity produces food is essential to achieve long-term environmental stability and to end the exploitation and suffering of farmed animals. One of our strategic objectives is to foster greater public and cross-sector understanding of the links between animal farming, environmental harm, health, sustainability and food security.

Food security has risen rapidly up the political agenda in recent years as a result of disappointing progress towards achieving the United Nations Sustainable Development Goal 2 (Zero Hunger) (United Nations, n.d.), as well as a series of geopolitical and climate-related shocks which have exposed the vulnerability of global food systems and driven volatility in the supply and price of certain foods and agricultural inputs. Against this backdrop, it is increasingly important to understand how different approaches to food production could contribute to a more secure and resilient food system.

Significant structural problems continue to negatively impact the accessibility of healthy foods, including inequality, poverty and debt. In addition, confidence in global trade to reliably meet national food demand has been undermined in recent years by specific supply chain shocks, including the COVID-19 pandemic and geopolitical conflicts such

as the Russia-Ukraine War and the US-Iran War. These are coupled with the increasing disruption to food supply chains caused by extreme weather events, a symptom of the climate crisis. Together, these pressures have reinforced the urgency of transforming food systems to become more resilient, equitable and sustainable.

In the UK, the government has identified food security as a priority goal in the first stage of its new food strategy. As a UK-based charity, we will discuss UK-specific food security challenges and opportunities where relevant throughout this report, in tandem with broader discussions about global food security.

Food security is a complex and multifaceted issue; therefore, this Research Briefing is not intended to be exhaustive. Rather, it provides a concise overview of some of the major food security challenges of our time, and the potential for plant-based diets to be part of the solution from a global perspective, drawing on the UK as a case study where appropriate. A shift towards a plant-based food system should be understood as a contribution to a broader transformation towards food systems that are healthy, sustainable, equitable and resilient, rather than a standalone solution.

OUR KEY FINDINGS

- **A transition away from animal agriculture would yield substantial benefits that make it an important part of efforts to tackle global food insecurity.** Plant-based diets should be understood as a contribution to a broader transformation towards food systems that are healthy, sustainable, equitable and resilient, rather than a standalone solution.
- **Animal agriculture undermines food security by diverting large amounts of edible crops and land to feed farmed animals.** Redirecting these crops to direct human consumption could substantially increase available calories and free up vast areas of land.
- **A plant-based agricultural food system could play a significant role in mitigating the climate and biodiversity crises,** two of the most pressing threats to global food production.
- **The production of animal products typically requires greater amounts of agricultural inputs than plant-based alternatives.** Shifting away from animal farming would reduce countries' reliance on imported feed, fertiliser and energy, helping to buffer against climate, geopolitical and pandemic-related shocks.
- **A significant proportion of global finance to agricultural producers supports meat and dairy production.** Redirecting these funds towards activities such as fruit and vegetable production, diversified protein production and the repurposing of grazing land could promote more sustainable, healthy and resilient food systems.
- **A shift towards plant-based diets has strong potential to reduce food expenditure across diverse geographies.** However, the affordability of plant-based diets varies by dietary composition and income level, highlighting the need for a transition away from animal agriculture to be accompanied by broader strategies addressing poverty and structural inequalities.
- **An agricultural transition would need to be carefully managed with significant policy support to enable just transitions** into, out of and within the agricultural sector, and to ensure that nutritionally adequate plant-based diets are accessible to all.



OUR WORK ON FOOD SECURITY

Food security exists “when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO 1996). The world continues to grapple with widespread food insecurity affecting more than two billion people (FAO et al. 2026).

At The Vegan Society, we believe that veganism is at the heart of the food justice agenda. This Research Briefing contributes to two of our strategic objectives: supporting the growth in credible, peer-reviewed research on veganism and related topics; and fostering greater public and cross-sector understanding of the links between animal farming, environmental harm, health, sustainability and food security. We hope that this briefing serves as an informative resource for vegans, and indeed anyone seeking to understand more about what a transition away from animal agriculture and towards a system that supports the adoption of plant-based diets could mean for global food security.

Throughout this report, you will read about the current state of food security and some of the major food security-related challenges, both

in the UK and globally. The key drivers of food insecurity and/or threats to food security, as we see them, include poverty, land use pressures, population growth, the climate and biodiversity crises, geopolitical conflict, pandemics, antimicrobial resistance and corporate concentration.

The evidence for how a plant-based agricultural system could enhance food security is then outlined, focusing on many of the key drivers and threats identified. This section examines how such a system could facilitate a more efficient use of land, crops and public subsidies; reduce the environmental impacts of food production and vulnerability to external shocks; improve population health; generate healthcare and climate-related savings; increase the affordability of healthy diets, and more.

We then reflect on the barriers preventing such a transition from taking place, including economic barriers, nutritional security, political and industry resistance and public acceptance, before concluding with recommendations for The Vegan Society and other aligned organisations.



*At The Vegan Society, we believe that **veganism is at the heart of the food justice agenda***

METHODOLOGY

With threats to global food security on the rise, a growing body of evidence has emerged examining potential mitigation strategies, including a transition to plant-based diets. This briefing draws on a non-systematic review of academic studies and relevant grey literature.

The first stage of the review involved using keyword searches to identify literature from a range of academic sources as well as grey sources such as NGO reports on the topic of food security, farming transitions or plant-based agricultural solutions. These sources were evaluated for their reliability and relevance to the topic of this Research Briefing. The review process also involved identifying key debates within the

literature, widely accepted perspectives on food security and critically evaluating the strengths and weaknesses of relevant sources.

During the second stage, we identified themes across the literature: the current state of food security, the key threats to food security in the UK and globally, how an agricultural transition could enhance food security and the barriers to achieving such a transition to a plant-based agricultural system.

This process enabled us to identify gaps in the literature, most notably on the economics of an agricultural transition, as well as to develop recommendations for professional practice, including areas for potential future research.

WHAT IS FOOD SECURITY?

The 1996 World Food Summit defined food security as “when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO 1996). Four dimensions were associated with this definition of food security: availability, access, food utilisation and stability. Understanding of food security has since evolved, with the United Nations Food and Agriculture Organization’s High Level Panel of Experts on Food Security and Nutrition proposing two additional dimensions in 2020 (HLPE 2020), resulting in the following six dimensions:

Physical availability of food This is dependent on how much food is being produced and net trade.

Economic and physical access to food This refers to the ability of individuals or households to purchase or access food. Adequate national or international food availability does not automatically guarantee household-level food security.

Food utilisation This refers to how the body makes use of the nutrients in the food consumed.

Stability The consistency of the above three dimensions over time depends on factors such as weather conditions, political instability, economic shocks and the climate crisis.

Sustainability This refers to the ability of food systems to provide food security for current generations without compromising the economic, social and environmental foundations needed to ensure food security for future generations.

Agency This refers to the capacity of individuals or groups to make decisions about what foods they eat and produce, how that food is produced, processed and distributed within food systems, and their ability to engage in processes that shape food system policies and governance.

Food security is a complex and multifactorial issue. While this briefing highlights how a transitioning away from animal agriculture could contribute to improved food security, it should be noted that a plant-based food system is not a silver bullet. Food insecurity will persist unless structural issues are addressed, including poverty, inequality, conflict, debt, weak governance and policy and market distortions. Nevertheless, plant-based food systems are an important component of meaningful solutions.

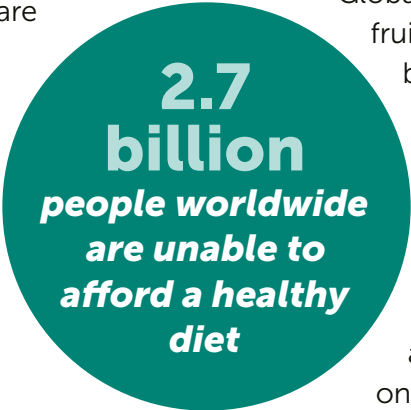
Current state of food security

According to the United Nations State of Food Security and Nutrition in the World 2026 report, 2.7 billion people worldwide are unable to afford a healthy diet, with the crisis worsening, particularly in Africa (FAO et al. 2026). The total number of people experiencing moderate to severe food insecurity worldwide is now 2.1 billion, equivalent to 25.8% of the global population – down from 28.7% in 2020 (FAO et al. 2026). An estimated 645 million people faced hunger in 2025. Globally, around two-thirds

(66%) of young children experience moderate or severe child food poverty, consuming foods from four or fewer food groups (UNICEF 2024).

Many countries are experiencing a double burden of malnutrition, with undernutrition and micronutrient deficiencies existing alongside overweight, obesity, type 2 diabetes and other diet-related non-communicable diseases (Batal et al. 2018; Swinburn et al. 2019). In 2022, 2.5 billion adults were overweight, including 890 million living with obesity. Among children and adolescents aged 5–19 years, around 390 million were overweight, including 160 million with obesity, representing a more than four-fold increase in prevalence since 1990 (WHO 2025).

Globally, the consumption of wholegrains, fruit and vegetables remains well below recommended levels. To achieve optimal fruit and vegetable intake (i.e. everyone meeting the World Health Organization’s recommendation of at least five portions per day), global production would need to increase, as the current output represents only 82% of the amount required (Food Foundation 2020).



25.8% of the global population experience moderate to severe food insecurity



A similar pattern is evident in the UK. **Only 9% of children and 17% of adults meet the 'five-a-day' recommendation for fruit and vegetable consumption** (OHID 2025). **To meet the potential demand if everyone followed public health guidance, nearly five times the current amount of fruit and vegetables produced in the UK would be needed** (Food Foundation 2023). In January 2026, 12% of UK households were food insecure, with half cutting back on fruit purchases (Food Foundation 2026a). Households in the lowest income fifth of the UK population would need to spend 85% of their disposable income on food to afford the government-recommended healthy diet (Food Foundation 2026b).

In the UK, the government considers food security to be "broadly stable", despite a trend of weakened stability in recent years contributing to price increases and food inflation (Defra 2024). The UK imports approximately 40% of its food and is particularly dependent on imported fruit,

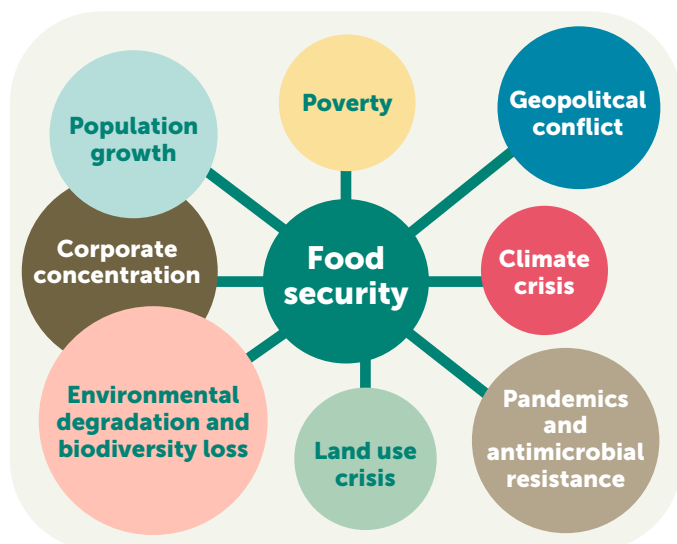
vegetables and seafood, of which only 15, 53 and 20% of demand, respectively, is met domestically. (Defra 2024; Heard et al. 2025).



Of course, we live in a globalised world and as a result we in the UK have become accustomed to certain fruits, vegetables and other foods that we cannot produce domestically. However, the scale of our reliance on imported foods represents a threat to our food security, particularly if there are any disruptions caused by market shocks, geopolitical conflicts or the climate crisis, which is projected to become a greater threat to food supplies in the future.

KEY GLOBAL FOOD SECURITY ISSUES

In this section we outline some of the major threats to food security and drivers of global food insecurity. This includes both challenges affecting food production and access to affordable, healthy diets. Each of these challenges requires careful consideration for those of us advocating for an agricultural transition away from animal farming.



Poverty

Globally, 2.7 billion people are unable to afford a healthy diet (FAO et al. 2026). Agricultural production responds primarily to effective economic demand rather than nutritional need. Where people cannot afford healthy diets, markets provide only weak incentives for farmers and food businesses to produce and market diverse, nutritious foods for local consumption. As a result, shortages of whole plant foods in local markets often reflect widespread income poverty rather than an inherent inability to produce them. Without viable local markets offering fair returns, many producers are driven towards export markets, commodity production or leaving agriculture altogether, thereby reinforcing the cycle whereby income poverty translates into food poverty.

Land use crisis

Pressures on land use are emerging as a major threat to food security. Competition for land is expected to intensify throughout this century due to rising demand for food, housing, carbon sequestration, renewable energy, nature restoration and other critical uses. According to the Institute for Public Policy Research, “there is, by good approximation, no new land for agriculture” (Bhunoo 2017). It has been estimated that there could be a global agricultural land deficit of 573 million hectares by 2050 – almost twice the size of India (Chatham House 2023).

The UK mirrors the global picture. An analysis of the land required for the UK’s biodiversity and net zero commitments found that an additional 1.4 and 4.4 million hectares would be needed by 2030 and 2050, respectively, if food waste, diets and agricultural productivity remain unchanged (Royal Society 2023).

Population growth

In July 2026, the global human population stood at around 8.3 billion (Worldometer 2026a). This figure is rising and is projected to peak at approximately 10.3 billion in the mid-2080s (United Nations 2024b). Meeting the food needs of a larger and increasingly urban population will require food systems capable of providing healthy diets sustainably and equitably. It has been estimated that agricultural production might need to increase by around 60–70% by 2050 under business-as-usual assumptions (Wijerathna-Yapa and Pathirana 2022), although such estimates have been widely criticised for assuming continued growth in resource-intensive diets.

The UK population is predicted to peak at 72.5 million in mid-2054, from 70 million in mid-2026 (ONS 2026; Worldometer 2026a).

Climate crisis

The climate crisis is arguably the greatest threat to global food production. Extreme weather events and changes in average temperature and rainfall can reduce agricultural productivity and cause crop failures, affecting both food and animal feed crops. Increasing temperatures drive sea level rise, threatening coastal regions often already vulnerable to food insecurity (Bhowmick and Suri 2025). Warmer temperatures also increase the prevalence of plant, farmed animal and fish diseases and parasites (Guiné 2024). Farmed animals may experience heat stress, which can impair growth and reproduction and, in severe cases, lead to mortality (Rojas-Downing et al. 2017). The climate crisis is already dislocating production in some regions and this trend is projected to continue throughout the century (Guiné 2024). Globally, 20% more people are expected to be at risk of hunger by 2050 due to extreme weather events (A Well-Fed World n.d.).

In the UK, the climate crisis is impacting both the supply and price of certain foods. Cereal production – the majority of which goes to animal feed – reached the highest level this century in 2019 (25.5 million tonnes), but fell to the second lowest the following year (19.0 million tonnes) (Defra 2024). Climate-related disruptions are particularly affecting the supply of milk, butter, beef and veal, chocolate and coffee. Prices for these foods increased by an average of 15.6% between August 2024 and August 2025, compared with 2.8% for other food and non-alcoholic drink items (ECIU 2025). The UK’s high dependence on imported fruit and vegetables is also a cause for concern, given that approximately one-third of these imports come from climate-vulnerable countries (Scheelbeek et al. 2020).

Globally, 20% more people are expected to be at risk of hunger by 2050 due to extreme weather events

Environmental degradation and biodiversity loss

The climate crisis is deeply intertwined with the biodiversity crisis, each accelerating the other. Biodiversity loss is occurring across all ecosystems and regions at an unprecedented level; the current extinction rate is tens to hundreds of times greater than the average over the past 10 million years, suggesting the sixth mass extinction is underway. Between 1970 and 2020, monitored global wildlife populations declined by 73% on average (HM Government 2026).

Biodiversity loss undermines ecosystem services critical to agriculture, including pollination, nutrient cycling, and water and climate regulation. The degradation of these services can lead to sterile agricultural land, depleted water tables, and increased flooding and drought conditions, all of which threaten food security, particularly in more vulnerable regions (Guiné 2024).

Geopolitical conflict

Wars and geopolitical tensions are major drivers of food insecurity both regionally and globally, affecting the availability and accessibility of food and farming inputs (Habiyaemye and Pietrack 2024). Russia's invasion of Ukraine contributed to raised global prices of oilseeds, cereals, fertiliser and energy, leading to the highest food inflation spike in the UK in 45 years (Edwards 2024). Fertiliser costs rose sharply from £1.5 billion in 2021 to £2 billion in 2022. Gas and electricity prices tripled and doubled respectively in mid-2022 (Edwards 2024).

In early 2026, the US-Iran war sparked global concerns over food security. Oil and gas prices surged following air strikes on shipping and energy infrastructures and the effective closure of the Strait of Hormuz, through which one-fifth

of global oil supplies and 25–35% of fertiliser raw materials pass (FarmingUK 2026). Roughly half of the global population depends on synthetic fertilisers for food production, which in turn rely heavily on natural gas and raw materials such as ammonia, potash, phosphate and sulphur (Ritchie et al. 2022b, Holsether 2026). When fertiliser markets become volatile, farmers often reduce or delay fertiliser application. This can result in lower crop yields months later, leading to food security challenges that emerge further down the line (Holsether 2026).

The current extinction rate is tens to hundreds of times greater than the average over the past 10 million years, suggesting the sixth mass extinction is underway

Pandemics and antimicrobial resistance

Pandemics pose a significant threat to food security, as demonstrated in the case of COVID-19. In many countries, workforces were moderated, which reduced food production and availability. Lockdowns and other national and international restrictions disrupted food supply chains and made it more difficult for individuals to access healthy food (Kakaei et al. 2022). This issue was exacerbated by increased rates of unemployment and poverty (Hassen and El Bilali 2024). As a result, the number of people experiencing moderate or severe food insecurity rose by 317 million from 2019 to 2020 (Defra 2024).

Antimicrobial resistance (AMR) – which occurs when bacteria, viruses, fungi or parasites are no longer affected by antimicrobial drugs – is increasingly referred to as a “silent pandemic” (WHO 2023). Unlike acute infectious diseases, AMR progresses silently but relentlessly, claiming the lives of 1.3 million people directly each year and contributing to the deaths of another five million people (Yoo 2025; United Nations 2024a). AMR also poses a serious and growing threat to global food security. Contamination of food products with resistant bacteria can trigger

product recalls, trade bans and loss of consumer confidence, thereby compromising the availability of safe food (Elbehiry et al. 2025). AMR-related food incidents can also raise production costs and lead to market losses, limiting access to healthy foods, particularly in low- and middle-income countries.

Corporate concentration

The global food system is increasingly dominated by a small number of large corporations, with concentration rising across most stages of the supply chain. This trend has significant implications for food security.

A limited number of firms control key agricultural inputs: four companies account for around 50–60% of the global commercial seed market and 70% of the pesticide market, while five firms control an estimated 70–90% of global grain trade (Clapp et al. 2025, Chicoma and Reynolds 2025). Corporate concentration is enabling dominant firms to shape food environments, including what foods are available, affordable and marketed.

Across fisheries and aquaculture, large corporations are exercising widespread control of the food supply from production (capture or farming) through to export markets (Chicoma and Reynolds 2025). Similar trends are evident in the animal agriculture sector, where consolidation is increasing across breeding, feedlots, slaughter, processing and distribution (Deconinck 2021; Pudenz and Schulz 2024). By 2014, the top 10 meat processing companies controlled 75% of cow slaughter, 70% of pig slaughter and 53% of

chicken slaughter (IPES-Food 2022).

A growing body of evidence indicates that corporate concentration can undermine food security in several ways. It can increase vulnerability to supply chain disruptions and exacerbate environmental degradation through intensive production systems (HLPE 2020; Fakhri 2025). It can also negatively impact public health through the increased marketing of unhealthy foods and the significant lobbying power of large corporations (WHO 2024). While corporate concentration can sometimes reduce food prices, these benefits often come at the expense of farmers' and workers' incomes (Clapp et al. 2025). Moreover, small-scale producers may become dependent on large corporations, with limited bargaining power and reduced agency (HLPE 2019). A 2022 report by Global Witness found that Europe's meat industry is driving human rights abuses in Paraguay. Rural communities are enduring illegal evictions, armed attacks and poisoning by illegal fumigations, all so large-scale agribusinesses can secure land to grow soy for export, around 80% of which is used in animal feed (Global Witness 2022).

A closely related issue is the concentration of land ownership. The UK is a prime example of this: around half of land in England is owned by less than 1% of the population (approximately 25,000 individuals and corporate entities). Consequently, a small number of landowners, corporations and investors make decisions about what is produced, how it is produced and to whom it is sold (Selwyn 2022).



Corporate concentration is enabling dominant firms to shape food environments, including what foods are available, affordable and marketed

HOW CAN WE ENHANCE FOOD SECURITY?

A shift away from animal agriculture is not a panacea, and a plant-based agricultural system would not on its own be enough to ensure food security for all. Nevertheless, it would yield substantial benefits that make it a critical part of the solution (A Well-Fed World 2025). Here, we discuss these benefits.

Crop use

Transitioning away from animal agriculture could enhance food security by increasing the availability of calories for human consumption. Globally, around 40% of calories produced on existing croplands are currently fed to farmed animals, who return only a fraction of that energy as meat, milk or eggs (West et al. 2026). For example, pigs return just 11% of the calories and 15% of the protein they are fed as meat, while cows return only 5% of calories and 10% of protein (CIWF 2025). A recent study estimated that if all crop calories were instead directly consumed by humans, enough calories would become available to feed an additional 7.2 billion people (West et al. 2026).

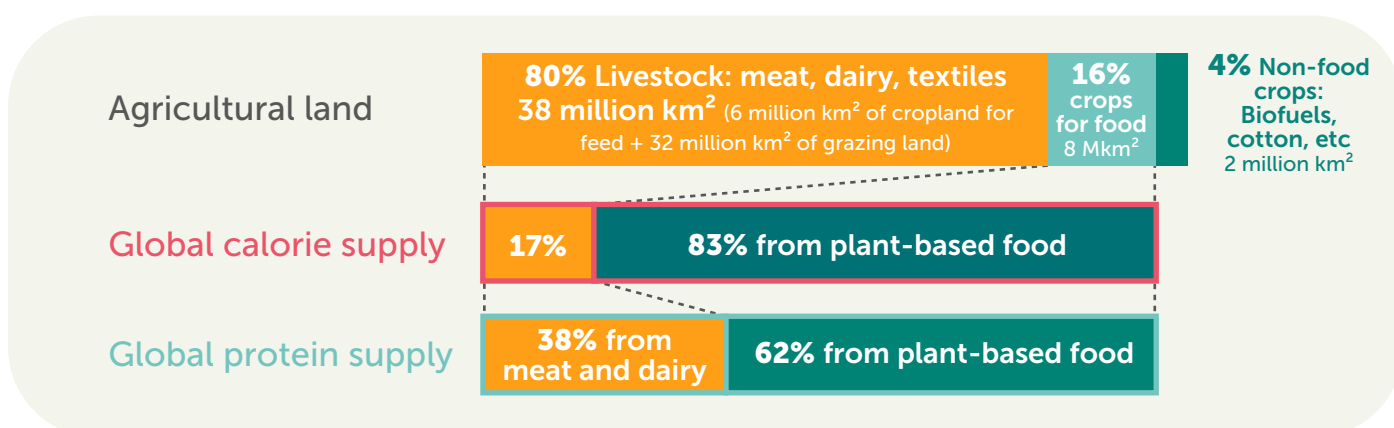
In the UK, more than half of domestically produced grain (wheat, barley and oats) is used to feed farmed animals. This results in as much as 8.3 million tonnes of grain being effectively 'lost' each year, exceeding the level of annual household food waste (6.4 million tonnes, CIWF 2025). According to the UK government's latest

food security assessment, **UK-produced grain alone "would nearly sustain the population from a purely calorific perspective if it was consumed directly by humans"** (Defra 2024).

A transition to plant-based agriculture would therefore go a long way in addressing the 'availability' dimension of food security because of the inherent caloric inefficiency of feeding crops that can be consumed directly by humans to farmed animals. A far lower volume of crops would need to be grown if everyone followed a plant-based diet, the land use implications of which are discussed in the following section.

Land use

Shifting away from animal agriculture would free up vast areas of land, which could be repurposed to strengthen food security both directly and indirectly. The vast majority (80%) of global agricultural land is associated with animal agriculture, through grazing animals and growing their feed (Poore and Nemecek 2018). However, as we can see in the figure below, animal products provide only 17% of global calories and 38% of global protein, representing a serious misuse of our limited supply of cropland. A worldwide adoption of plant-based diets is estimated to require 19% less cropland and 75% less agricultural land overall (including cropland and grazing land), with the latter reduction equivalent to an area the size of North America and Brazil combined (Ritchie 2021).



The share of global calories and protein supplied by animal products is disproportionate to the land use of meat and dairy production (Source: Ritchie and Roser 2024b).

The amount of grazing land that could be used to grow crops for human consumption is highly uncertain. A 2017 study estimated that approximately 700 million hectares (out of about two billion hectares) of global grasslands could potentially be converted to cropland, equivalent to 14% of global agricultural land (Mottet et al. 2017). However, such conversion may not be necessary, as the amount of global cropland is estimated to be more than sufficient to sustain the human population under a plant-based food system (Ritchie 2021).

The freed-up grazing land could be used for various other purposes, including nature restoration and climate mitigation (e.g. through reforestation and peatland restoration). One study estimated that a global shift to vegan diets by 2050 could enable carbon sequestration equivalent to 99–163% of the carbon dioxide (CO₂) emissions budget, consistent with a 66% probability of limiting warming to 1.5°C (Hayek et al. 2020).

The UK government has acknowledged in a national security assessment that **“the UK does not have enough land to feed its population and rear livestock: a wholesale change in consumer diets would be required”** (HM Government 2026). Cropland released by a national shift to plant-based diets could feed an additional 16.5 million people (CIWF 2025), while reforesting UK pastureland could remove the equivalent of nine

years of UK CO₂ emissions from the atmosphere (Harwatt and Hayek 2019). Importantly, the land footprint of UK meat and dairy is not confined to its borders; around 850,000 hectares of land – largely in South America – are used to grow soy to feed farmed animals in the UK, contributing to deforestation and biodiversity loss (WWF 2022).

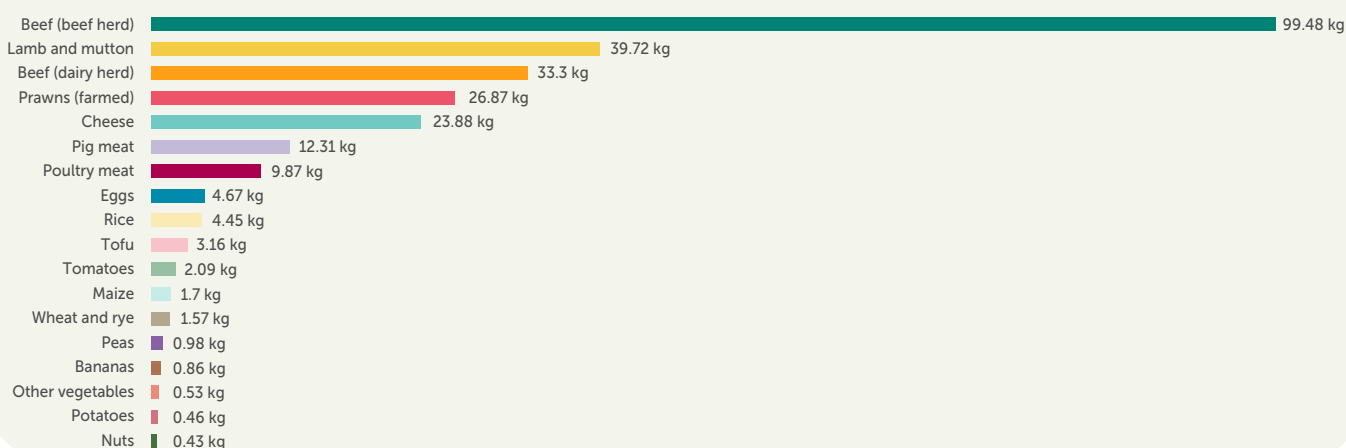
A transition in our food system therefore offers a significant opportunity to alleviate land use pressures and ensure sufficient land is available to feed a growing global population. It could also facilitate large-scale nature restoration and carbon sequestration efforts, helping to mitigate the climate and biodiversity crises that increasingly threaten global food security.

Climate crisis

A global shift away from animal agriculture could also help mitigate the climate crisis by reducing greenhouse gas (GHG) emissions from food production. While GHG emissions can vary depending on climate region and measurement method, plant-based foods have consistently been shown to have lower GHG emissions than animal-based foods (Twine 2024). In an analysis of 40 food products representing 90% of global protein and calorie consumption, GHG emissions from beef (excluding beef from the dairy herd) were 22 times higher than rice per kilogram, the highest-emitting crop, and 31 times higher than tofu (Poore and Nemecek 2018; Figure below).

Greenhouse gas emissions per kilogram of food product

Greenhouse gas emissions are measured in kilograms of carbon dioxide-equivalents. This means non-CO₂ gases are weighted by the amount of warming they cause over a 100-year timescale.



The need to shift away from animal-based foods is recognised by leading climate change bodies. According to the Intergovernmental Panel on Climate Change (IPCC), **“where appropriate, a shift to diets with a higher share of plant protein, moderate intake of animal-source foods [...] could lead to substantial decreases in GHG emissions”** (IPCC 2022). The UK Climate Change Committee (CCC) has similarly recommended a 35% reduction in meat consumption and a 20% reduction in dairy consumption by 2050 (CCC 2025).

A recent study assessed the energy used by agriculture and food processing sectors between 2015 and 2019 to produce food for humans and feed for farmed animals. This included fuels, electricity, heat, machinery production and transport services. The authors found that animal products consumed around 60% of global agri-food system energy inputs. The vast majority (85%) of agri-food system energy inputs came from fossil fuels (Rasul et al. 2024).

By significantly reducing food-related emissions, transitioning away from animal agriculture could enhance food security by helping to stabilise the climate upon which agricultural productivity depends. Energy consumption is expected to be lower under a plant-based food system, reducing reliance on fossil fuels.

Environmental degradation and biodiversity loss

Beyond GHG emissions, an agricultural transition away from animal farming would deliver additional environmental benefits that could help mitigate biodiversity loss and improve food security. Animal agriculture is the single largest driver of tropical deforestation, with

pasture expansion for beef alone responsible for an estimated 41% of tropical deforestation on average between 2005 and 2013 (Ritchie 2024).

Furthermore, as diets lower in animal products require less land and crops overall, they typically demand fewer agricultural inputs, including energy, water, pesticides and fertiliser (Marlow et al. 2014). These reductions in farming inputs translate into more favourable environmental outcomes. A study of more than 55,000 vegans, vegetarians, pescatarians and omnivores found that vegan diets had the lowest environmental impacts across all indicators assessed. Compared with high-meat diets (over 100g of meat a day), vegan diets had a 73% reduction in eutrophication, a 54% reduction in water use and a 66% reduction in biodiversity loss (Scarborough et al. 2023).

*A study of more than 55,000 vegans, vegetarians, pescatarians and omnivores found that **vegan diets had the lowest environmental impacts across all indicators assessed***

Shifting away from the consumption of marine animals could have significant environmental benefits. While environmental impacts vary depending on the type of marine animal and how they are caught or farmed, research suggests that plant-based foods such as legumes and soy generally have substantially lower environmental impacts (Ritchie and Roser

2024a). Globally, 53% of total aquatic animal production now comes from aquaculture (FAO 2026). Aquaculture is associated with a range of environmental concerns, including the use of wild-caught fish as feed for carnivorous farmed species; water pollution from fertilisers, pesticides, antibiotics and animal waste; the transmission of diseases and parasites to wild fish populations; and mangrove deforestation (Jeanson et al. 2022; Garlock et al. 2024; Arshad et al. 2024).

Wild capture fisheries similarly have significant environmental costs. The most common method of fishing globally, bottom trawling, involves dragging weighted nets along the seabed (Ritchie

and Roser 2024a). This practice can injure or kill a wide range of marine animals and damage seafloor habitats, reducing biodiversity (McLavery et al. 2024). Overfishing is another major concern, with more than one-third of the world's assessed fish stocks classified as overfished (Ritchie and Arriagada 2026). Overfishing can disrupt marine food webs and threaten the long-term health of ocean ecosystems.

By reducing deforestation, conserving critical natural resources and mitigating biodiversity loss, a transition away from animal agriculture would help preserve the ecosystem services essential to global food production, thereby fostering a more resilient, sustainable and secure food system.

Vulnerability to external shocks

In addition to reducing environmental impacts, a decreased demand for farming inputs can strengthen food security by lowering nations' reliance on imports such as feed, energy and fertiliser. These inputs can be highly vulnerable to external shocks; for example, inflation in grain prices arising from the war in Ukraine in 2022 drove increases in compound feed costs that were so severe they forced UK farmers to reduce farmed animal numbers (Defra 2024).

Furthermore, animal-based foods are particularly vulnerable to climate shocks relative to plant-based foods as the climate crisis

threatens the production of animal-based foods both directly (by affecting farmed animals) and indirectly (by affecting crops used as animal feed) (Rojas-Downing et al. 2017; Guiné 2024; Bhowmick and Suri 2025).

It is important to note that meeting demand for animal-source foods through domestic production is not, in itself, indicative of food security. In the UK, for example, self-sufficiency is commonly measured using the production-to-supply ratio, defined as the farmgate value of raw food produced divided by the value of raw food available for human consumption (Defra 2024). Based on the UK government's latest food security assessment, the UK appears largely self-sufficient in poultry (96%) and moderately so in pork (69%) (Defra 2024). However, these figures do not account for dependence on imported agricultural inputs. When imports of soy for animal feed are factored in, self-sufficiency falls to 54% for chicken and 41% for pork (CAWF 2025). Fully onshoring pig and poultry feed production is estimated to require a 60% expansion in cropland devoted to pig feed and a 78% expansion in cropland devoted to poultry feed (The Landworkers' Alliance et al. 2023). This would not be feasible given the UK's land constraints; a dietary shift towards plant-based diets is a considerably more viable pathway to improving food security.

*By reducing deforestation, conserving critical natural resources and mitigating biodiversity loss, a **transition away from animal agriculture** would help preserve the ecosystem services essential to global food production*



Population health

Food security is not only about ensuring that food is available and accessible, but also that it is nutritious and safe, to support an active and healthy lifestyle. In this sense, widespread adoption of a plant-based diet could enhance food security; there is strong evidence linking plant-based foods and plant-rich diets with lower risks of cardiovascular disease, certain cancers, type 2 diabetes and other conditions (Almuntashiri et al. 2025). The latest EAT-*Lancet* Commission report reaffirmed the health benefits of consuming more fruit, vegetables and other plant-based foods, as well as consuming less meat. A global shift to their predominantly plant-based 'planetary health diet' (PHD) could prevent approximately 15 million deaths per year (27% of total deaths worldwide) (Rockström et al. 2025).

A plant-based agricultural transition could further enhance population health by reducing the prevalence of AMR and some drivers of zoonotic diseases. Around 70% of antibiotics used globally are given to farmed animals, and approximately 75% of emerging infectious diseases originate in non-human animals (Sharan et al. 2023; Ritchie and Spooner 2024). Industrial animal agriculture can create breeding grounds for zoonotic infections by concentrating large numbers of animals into confined, often unsanitary, spaces (Hayek 2022). Furthermore, agricultural expansion has led to encroachment into wildlife habitats, bringing humans, farmed animals and wildlife into closer contact and increasing opportunities for the transfer of pathogens (Sharan et al. 2023). COVID-19, for example, is believed to have been transmitted to humans from wild mammals sold at a meat market in China (Liu et al. 2023).

Macroeconomic impacts

A transition away from animal farming is expected to yield substantial benefits at the macroeconomic level, facilitating greater investment in sustainable and secure food systems. In England, a nationwide adoption of plant-based diets could save the NHS approximately £6.7 billion annually (Henderson and Sampson 2023), while even a 20% replacement of factory-farmed meat with alternative proteins – plant-based substitutes for meat and dairy – in the UK could reduce environmental damage by £32 million per year (CAWF 2025).

Global support to agricultural producers totals approximately 540 billion USD per year, and includes production subsidies, producer price support and procurement measures, as well as measures designed to reduce the cost of farming inputs such as fertilisers and seeds (FAO et al. 2026). Around 70% of this support is directed towards

the production of grains, sugar, dairy, beef and oil crops for animal feed. Such support has made these foods cheaper than non-subsidised alternatives, while also encouraging investment in their supply chains, making it more difficult for fruits and vegetables to compete (FAO et al. 2026). In the European Union, an estimated 82% of agricultural subsidies under the Common Agricultural Policy (CAP) support animal-based foods, either directly or indirectly via animal feed (Kortleve et al. 2024). This support includes direct payments to producers, which are allocated according to utilised agricultural area; market measures that support animal products (such as border tariffs); and explicit support for the production or consumption of animal products, for example payments rewarding the production

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of specific animal products, subsidies for farm investments and improvements, and the EU School Milk Scheme (Kortleve et al. 2024). Redirecting these funds towards activities such as fruit and vegetable production, diversified protein production and the repurposing of grazing land could promote more sustainable, healthy and resilient food systems.

Affordability

Food accessibility, a core dimension of food security, is largely determined by cost. A recent review synthesising global evidence on the affordability of plant-based and omnivorous diets found that **“controlled interventional trials and real-world observational data consistently demonstrate that [plant-based diets], particularly those emphasizing whole and minimally processed foods, are associated with lower daily food expenditures than omnivorous diets across multiple geographic contexts”** (Goldman and Nagra 2026). These cost advantages are primarily driven by the exclusion of expensive animal products, with savings often outweighing increased spending on fruits, vegetables and legumes.

However, the review identified variability between income levels and plant-based diet

types. In high-income countries, specialty processed plant-based products (e.g. plant-based meat and dairy alternatives) can increase costs relative to omnivorous diets, while whole-food plant-based diets consistently demonstrate cost savings. In middle-income countries, whole-food plant-based diets similarly offer consistent affordability benefits. In low-income countries, however, even reduced-cost plant-based diets may be unaffordable for many due to extremely constrained food budgets (Goldman and Nagra 2026). More research is therefore needed to understand how people facing significant economic challenges could be supported to achieve food security within an alternative agricultural system, including the policy measures required to ensure that the transition would not exacerbate existing inequalities.

Overall, current evidence indicates that a shift towards plant-based diets has strong potential to reduce food expenditure across diverse geographies, thereby enhancing the affordability dimension of food security. However, outcomes vary by dietary composition and income level, highlighting the need for change to be accompanied by broader strategies addressing poverty and structural inequalities.



*Overall, current evidence indicates that **a shift towards plant-based diets has strong potential to reduce food expenditure across diverse geographies***

BARRIERS TO AGRICULTURAL TRANSITION

Our food system is broken, but it can be fixed. In order to build a better agricultural system, we need to understand the obstacles in our way. This section summarises some of the main barriers impeding a transition to a plant-based food system.

Economies and livelihoods

The global farmed animal sector is valued at over 1.4 trillion USD and is estimated to account for around 40% of agricultural GDP (Awokoya et al. 2019; Salmon et al. 2020).

Transitioning away from such a large sector would have major economic implications that would reverberate throughout the globe (Awokoya et al. 2019).

Evidence concerning the potential impact on developing economies is mixed. A 2018 study found that reducing global meat consumption would negatively impact developing economies, with the authors speculating that higher meat consumption in developed countries increases imports from developing countries, thus fuelling the economic growth of the latter (Marques et al. 2018). However, a literature review conducted on behalf of the Food and Agriculture Organization of the United Nations concluded that “a shift to plant-based diets globally would likely prove more beneficial for emerging economies than continuing with the meat-based diets currently held throughout much of the developed world” (Awokoya et al. 2019).

Shifting away from animal farming would also have significant implications for livelihoods. Over one billion people depend on farmed animals for income, particularly in developing regions (Dorgbetor et al. 2022), with a recent

study estimating that a global transition to 100% plant-based diets could result in large-scale job losses (Vittis et al. 2025). However, the study does not account for the potential role of alternative proteins in future food systems. According to a report by the ClimateWorks Foundation and the Global Methane Hub (2023), scaling investment in alternative proteins to support a shift away from products from cows and sheep could generate up to 83 million jobs by 2050. In the UK alone, the alternative protein sector could create 25,000 jobs by 2035 (Green Alliance 2023).

While the net impact on livelihoods remains uncertain, it is clear that a global shift away from farming animals would require significant financial and regulatory assistance to ensure just transitions into, out of and within the agricultural sector.

The need for such support is not unique to agriculture; transitions in the energy sector have been accompanied by ‘just transition’ policies, including retraining programmes, social protection measures and regional investment schemes designed to support affected workers and communities (European Commission n.d., ILO n.d.).

“a shift to plant-based diets globally would likely prove more beneficial for emerging economies than continuing with the meat-based diets currently held throughout much of the developed world”

Nutritional security and health

Animal products currently play a significant role in global diets, supplying 17% of calories and 38% of protein consumed worldwide (Poore and Nemecek 2018). In high-income countries, animal protein accounts for 63% of dietary protein on average, compared with 15% in low-income countries (Roser et al. 2023). While properly planned vegan diets can meet nutritional requirements across all life stages, poorly

planned vegan diets may lack nutrients such as B12, which is acquired through supplementation or consumption of fortified foods (NHS 2025). A global transition away from animal agriculture would need to be carefully managed with sufficient policy support to ensure that nutritionally adequate vegan diets are accessible to all (Suri and Ray 2023).

Political and industry resistance

Political and industry resistance represents a significant barrier to food system transformation. Existing agricultural subsidies, research funding and market structures are heavily oriented towards animal agriculture. As a result, industries with a vested interest in maintaining current production systems often have substantial capacity to influence policy. A recent report by independent think tank InfluenceMap illustrates this dynamic. The report analysed the advocacy activities of the ten largest meat and dairy companies in Europe, alongside the five largest industry associations, in relation to six key EU policies aimed at reducing GHG emissions from agriculture. The findings revealed that, following intensive lobbying efforts, two of the six policies were significantly weakened, while three appeared to have stalled entirely (InfluenceMap 2024).

Public acceptance

A number of barriers hinder consumers from shifting to a plant-based diet, with taste, habit, convenience, perceived health impacts and costs among the most commonly reported (Fehér et al. 2020). Sociocultural factors can further impede dietary transitions; animal products have been a prominent aspect of many cuisines for centuries, often featuring in traditional dishes and social gatherings. Consequently, a transition towards plant-based diets would require substantial changes in consumer behaviour and social norms. This could be achieved through interventions such as those outlined in the Ten Point Plan for Plant-Rich Diets, a joint policy paper supported by at least 60 organisations including The Vegan Society. Such recommendations include leveraging public procurement and catering to source and provide more plant-based foods, encouraging food supply companies to transition towards a higher proportion of sales of plant-based foods, providing practical education for the general public about preparing and cooking plant-based foods, providing fruit and vegetables through voucher schemes to make it easier and more affordable for people to access healthy foods, and more (Foodrise et al. 2025).



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REMAINING KNOWLEDGE GAPS

Our review of the current literature has identified three key knowledge gaps that warrant further research.

1 Economic impacts and accessibility

Further research on the impacts of a transition away from animal farming on people's livelihoods and global trade would be beneficial. More evidence is also needed to better understand the national and regional economic impacts, as well as how agricultural production could be distributed to support developing economies. It is clear that such a large-scale transition would require substantial governmental planning, but the scale of investment and economic restructuring required is not yet well understood. More research is also needed to understand how people facing significant economic challenges could be supported to achieve food security, including the policy measures required to ensure that an agricultural transition would not exacerbate existing inequalities.

2 Crop production

Further research is needed to understand how

a plant-based agricultural food system would affect current patterns of crop production. Key questions include which crops would need to be scaled up or down, discontinued or newly introduced, and where such crops could be grown. Addressing these questions requires further research into a wide variety of crops, including their nutritional value, economic viability, climate resilience and environmental and input requirements.

3 Land use allocation

While it is widely understood that a shift away from animal agriculture would free up vast areas of land, further research is needed to determine how this land could be most effectively allocated across different uses, at a national and regional level. Such assessments should consider land suitability, as well as the impacts of different land uses on a range of factors, including the climate, biodiversity, economies and individuals' health and wellbeing. The practicalities of repurposing this land would also need to be assessed, which may be significantly constrained by patterns of private land ownership.

LIMITATIONS

This Research Briefing provides a succinct overview of plant-based diets and food security at the global level, with reference to the UK where relevant. Food security is a complex and multifaceted issue, and we recognise that there are regional differences and nuances not captured in this briefing. We also acknowledge

that food security is a fast-evolving area and is being particularly affected by geopolitical conflict at the time of writing; as such, this briefing may not provide a fully comprehensive picture of the current state of food security.

BEYOND FEEDING THE WORLD: EXPANDING THE FOOD JUSTICE CONVERSATION

An Opinion Piece by Dr Abi Masefield

I have spent more than thirty-five years working as an expert in food security and nutrition policy, first with NGOs and then advising governments, UN agencies and currently the European Union. Much of my career was spent in Africa and South Asia, where, for so many, food remains an issue of power, livelihoods, dignity and survival. Over the same period, I have also been vegan.

For years I struggled to understand how these two parts of my life fitted together. It was through my PhD that I realised they were connected by the same questions about power. Who controls food? Who benefits from the way food systems are organised? Who bears the costs? These are questions of justice before they are questions of food. And yet thinking about food security debates often starts by thinking about production: Is there enough food to feed the world? and Could vegan agriculture feed the world better? After three decades working in this field, I have become convinced that there is a bigger question.

Hunger and malnutrition are no longer confined to the Global South. They coexist with food banks, insecure work, poor diets and chronic disease across high-income countries, including here in the UK. Whether we call it food insecurity, food poverty or a cost-of-living crisis, the reality is the same: millions are denied their basic human right to adequate food, not because food is unavailable, but because they cannot afford healthy diets.

The real issue, then, is not simply producing more food. It is who has the income, resources and power to obtain it. As the Nobel Prize-winning economist Amartya Sen showed, famines occur even when food is available. The economist Jason Hickel extends this argument, showing how colonial extraction, unequal trade, global value chains and concentrated corporate power continue to shape who can eat well and who cannot. Hunger persists not because humanity lacks food, but because too many people remain excluded from the resources needed to obtain it.

I believe veganism has an extraordinary opportunity to contribute to a much wider conversation. Across the world, agroecology, organic farming,

permaculture, food sovereignty, Indigenous food systems and shorter local food value chains all seek food systems rooted in ecological regeneration, democratic control, resilient local economies and respect for life rather than extraction. Although they differ – and not all advocate veganism – they share a commitment to reducing violence within food systems.

The emerging veganic movement demonstrates that vegan principles can support regenerative farming that builds healthy soils without animal agriculture. More broadly, it suggests that veganism has something distinctive to contribute to the food justice movement by asking for justice itself to extend across the species boundary while never losing sight of the urgent need for food justice for all people.

My research has led me to conclude that the same structures of power that normalise the exploitation of animals also underpin many forms of human inequality. Colonialism, racism, patriarchy, land dispossession, labour exploitation and corporate concentration all rely, in different ways, on assigning unequal value to different groups of living beings. Some lives are protected; others become available for use, extraction or sacrifice. Within humanity this logic has justified slavery, colonial domination and exploitation. Across the species boundary it continues to justify the routine exploitation of billions of animals. These are not identical forms of oppression, but they arise from similar hierarchies of value that make violence – including the violence of food insecurity – appear normal and necessary. Decolonising food systems therefore means more than changing ownership or restructuring supply chains. It means challenging those hierarchies and building food systems rooted in justice, dignity and non-violence – for people, other animals and the living world on which we all depend.

Dr Abi Masefield is an independent consultant on food security and international development and a member of The Vegan Society's Research Advisory Committee.

IMPLICATIONS FOR PROFESSIONAL PRACTICE

This Research Briefing has been produced as a key resource for those wishing to better understand the food security challenges of today. It will also help inform The Vegan Society's future campaign or policy-related activities. As such, we have the following reflective recommendations for our organisation and for the environmental movement more broadly.

Recommendation 1

• **Further research should be undertaken addressing the following questions:**

- What impact would transitioning away from animal agriculture have on the economies of rural areas? In particular, what opportunities or risks are there for job creation and what support would be required for farmers and producers?
- What changes to current crop production patterns would be required under a plant-based agricultural system? What crops would we need to grow more or less of, and how feasible would these changes be?
- How could the land freed up from a shift away from animal agriculture be most effectively allocated across alternative uses? Specifically,

how economically viable would it be to use this land for rewilding or other non-agricultural purposes?

Recommendation 2

• **The Vegan Society and other aligned organisations should increasingly position vegan solutions within food security and national security frameworks.** This will require more proactive engagement with relevant organisations to promote plant-based solutions to the modern day challenges of our food system, emphasising evidence on crop efficiency, land use and resilience to climate and geopolitical shocks.

Recommendation 3

• **The Vegan Society and other aligned organisations should advocate for robust just-transition policies** for farmers, including financial, regulatory and training support to diversify protein production, transition cropland away from feed production and repurpose grazing land. This will require ongoing communication with farmers to better understand the role all organisations in the food and environment space can play in supporting a plant-based transition.

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