FORUM FOR THE FUTURE

THE FUTURE OF FOOD:

ARE FOOD BUSINESSES ON TRACK TO DELIVER A SUSTAINABLE PROTEIN SYSTEM BY 2040?

FORUM FOR THE FUTURE

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"The global food system is at the very heart of the climate crisis, both through its greenhouse gas emissions and the impact of weather extremes on production systems and changing consumer/regulatory sentiment on markets.

This report highlights that while welcome steps are being taken in response, business commitments and actions are still far short of the pace and extent of the change that's needed. I see real opportunities for businesses that are prepared to lead in this space and embed sustainable protein into their core business strategies."

Mike Barry, Sustainable Change Maker
(ex. Director of Sustainable Business, M&S)

To download and executive summary of this report visit:
www.forumforthefuture.org/the-future-of-food

EXECUTIVE SUMMARY

The food industry is at the centre of a number of major global challenges: among them how we address climate change and biodiversity loss, while also delivering healthy, nutritious food for all in the face of shrinking resources and a growing global population.

The food system can transform at scale and pace to deliver sustainable nutrition that is good for both people and planet. But, in the face of a growing emergency for climate and biodiversity, is it on the right trajectory given the time we have left?

This report assesses how a key aspect of our food system - protein - is changing. We know that our production and consumption of protein is in need of rapid transformation. This essential component of our diets is linked to a number of critical sustainability issues and, most prominently, to the climate challenge. Business as usual is not an option. For example, if the number of livestock continues to grow on its current trajectory, their cumulative emissions between now and 2050 could be equivalent to one third of the total remaining 1.5˚C carbon budget. At the same time, much of the fertiliser applied to boost protein production ends up as a pollutant in waterways, while pressure on our natural ecosystems is at breaking point.

These critical issues formed the basis for the "Protein Challenge 2040" - one of the first ever international protein collaborations, centred on a core challenge: how do we provide up to 10 billion people with enough protein in a way that is healthy, affordable and good for the planet? Formed in 2015 and facilitated by Forum for the Future, it brings pioneering businesses and NGOs together to focus and accelerate systemic change toward a new approach to protein. Through detailed diagnosis, this landmark collaboration identified a number of major impact areas in need of rapid transformation, which coalesced into two key workstreams: rebalancing protein in our diets; and building a sustainable future for animal feed.

Over the last four years the scale of attention to protein has increased rapidly. From the latest insights released by the World Resources Institute in 2018 to those from the EAT-Lancet Commission and the Food and Land Use Coalition in 2019, research highlights the need for a dramatic shift toward plant-based diets in Western diets, and the need to address the sustainability of meat and dairy production. And protein has hit public consciousness over the last 18 months, from excitement around innovative alternative protein sources, innovations in animal feed such as insects, a public debate raging around the future of meat in our diets, and a renewed focus on the role of our food system in the climate challenge.

In all this noise, this report aims to cut through the hype to understand whether current commitments and activities will all add up to a big enough change to meet our global challenges. Are businesses ready to deliver a sustainable protein system and what action is needed to make this transformation happen?

It shines a light on the current 'State of the Market', assessing the public commitments of 132 of the largest and most influential businesses globally that interact with protein - across retailers, food service, food and ingredient manufacturers, meat and dairy producers and feed producers, as well as understanding the enabling forces that shape markets: governments, NGOs and the investor community. It asks whether companies are:

- **Enabling rebalancing of Western diets towards a more diverse selection of proteins - especially plant proteins?**
- **Engaged with livestock protein by working to enable sustainable animal feed?**
- **Taking an integrated approach to protein in their business' overall strategies?**

These are important indicators of what progress is being made, although it is worth noting that a comprehensive business strategy needs to cover a number of related impact areas, from animal welfare and, management of fish stocks and aquaculture to regenerative agriculture practices and management of protein waste.

KEY FINDINGS

We are seeing the seeds of transformation, with signs of change towards a diverse and sustainable protein offer, for example:

- The **inclusion of plant-based meals** by catering companies such as Sodexo, Compass and BaxterStorey.
- High-profile **acquisitions of disruptive plant protein companies** by food businesses, especially in the EU and US, such as Sweet Earth, acquired by Nestlé and WhiteWave, acquired by Danone, both in 2017.
- The **launch of blended meat products** from a number of meat producers, alongside launches of plant-based ranges across the globe, from US retailer Kroger with its Simple Truth plant-based range to UK retailer M&S with its vegan Plant Kitchen range.
- The **emergence of novel animal feedstocks** such as insects, algae and single cell proteins from both innovative start-ups and market leaders such as Corbion and Cargill. And retailers such as Waitrose starting to work towards use of home-grown forage crops in their supply chains.
- **Commitments towards high-profile issues**, such as reducing the fishmeal used in aquaculture and ensuring deforestation-free soy, a key ingredient in animal feed, often grown in regions where important natural ecosystems are at risk, such as the Cerrado in Brazil.

White heat or white noise?
We have seen dramatic innovation in alternative protein offers: 55% of the reviewed companies report activities to increase the availability of plant protein products for human consumption. Some of the most significant progress we observed was in the food service sector with 61% of businesses adding new plant-based meals to menus and 52% of retailers also now having a clear plant-based offering.

This picture is rapidly evolving, even as we write this report, with 79% of food brands either investing, acquiring or launching new plant-based products and recent launches of blended meat and plant products from some of the largest meat producers in the world such as Tyson, Vion, Tulip, JBS and Smithfield.

Focus area 1: Rebalancing protein in Western diets

% of businesses actively advancing plant protein in portfolios or menus in the public domain

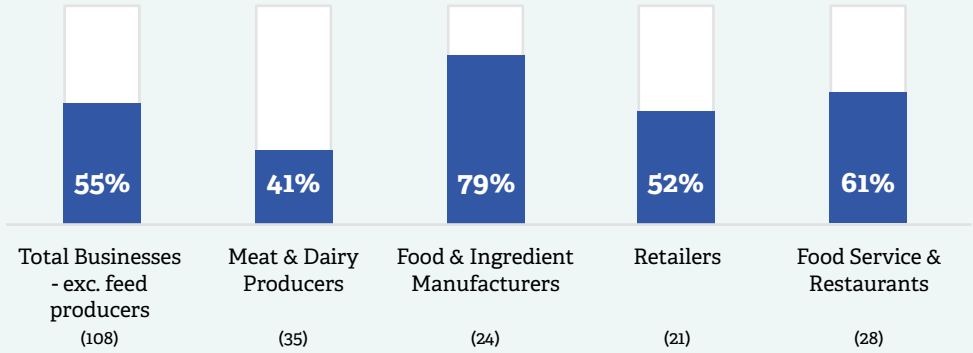

Figure 1: Proportion of businesses who are actively advancing plant protein in portfolios or menus in the public domain. For meat and dairy producers and food and ingredient manufacturers, includes: acquisitions, investments, new innovations, public commitments to expand range. For retailers and food service and restaurants, includes: new plant-based meals on menus, sales based targets, clear and promoted plant protein proposition on website, public commitment to expand range.

55%
of businesses are increasing availability of plant protein for human consumption

Sustainable animal feed is still a new issue:
Only a third (33%) of businesses are starting to make shifts towards delivering sustainable feed beyond single issue commitments, for example to zero deforestation soy, with the least public action coming from food service (only 25% have commitments towards responsible soy and even fewer have actions in feed beyond these single issue areas). The use of traditional forage crops and pasture-fed strategies received the least public attention from businesses across protein with only 5% highlighting activities in this area.

While 24% of feed and feed ingredient producers refer to research and development on novel feedstocks such as algae and insects, transforming this into mainstream production is a long way in the distance with little public commitment towards it from food and ingredient manufacturers or retailers.

Projects such as Feed Compass - part of Protein Challenge 2040 - promote collaboration across the supply chain to drive action on sustainable feed, but more widely action still seems in its infancy. This is potentially a significant risk for the livestock sector and may contribute to animal protein being further challenged as part of a future sustainable diet.

Focus area 2: Sustainable animal feed

% of businesses with public actions or commitments to each feed strategy

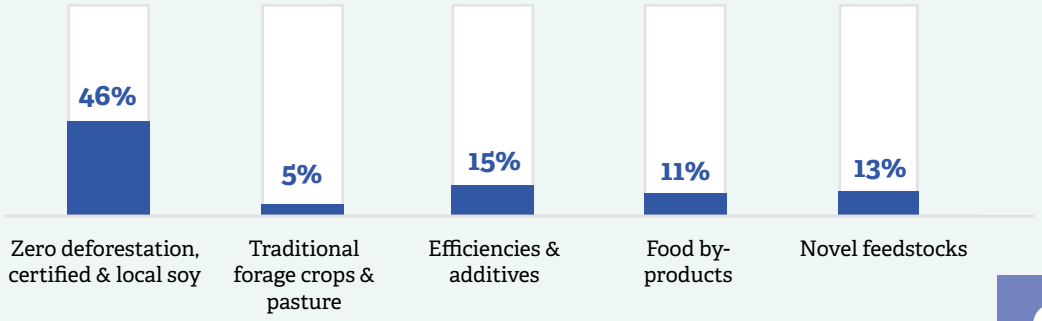

Figure 2: Proportion of businesses reviewed in this report, with public actions or commitments to each feed strategy. The total number of businesses included is 132; The numbers in the chart will not add up to 100%, as some businesses may occur twice if they are using a variety of strategies e.g. have a commitment towards zero deforestation soy and are also experimenting with novel feedstocks.

33%
of businesses are working on sustainable feed beyond single issue commitments

Integrating action across protein:
When looking for wider strategic transformation, few companies appear to be systemically joining the dots on integrated protein strategies to deliver better end outcomes for people and planet. On the surface, the numbers are promising: 45% of businesses reviewed have activities in their protein portfolios relating to both diversifying protein and sustainable animal feed. But this is fragmented, with the bulk of progress focused on product innovation in plant-based food and the specific commitment to transition to zero deforestation or certified soy in feed. A refocusing of food companies' strategies toward an integrated approach to sustainable protein is overdue.

Integrated protein strategies

% of businesses with public actions or commitments to each strategy area

45%
of businesses have actions across both rebalancing protein in Western diets and sustainable animal feed*

15%
of businesses have actions across rebalancing protein in Western diets and sustainable animal feed that go beyond sustainable soy*

15%
of businesses have developed a sustainable nutrition narrative*

11%
of businesses have Scope 3 emissions targets (time bound commitments to lower emissions from their supply chain and post consumption)**

Figure 3: Proportion of businesses reviewed in this report, with public actions or commitments towards each listed strategy area.

*Includes 108 businesses (exclude feed and feed ingredient manufacturers as they are largely not active in rebalancing consumer diets); ** Includes all 132 businesses

Increasing access to alternative protein products in retail and food service is promising, but what motivation underlies this? Is it simply a response to today's consumer zeitgeist, or a deeper commitment to delivering healthy sustainable diets?

Deep systemic change is urgently required. For example, new innovations in animal feed often remain more expensive and require greater structural change in the market to scale; change requires clear commitments from the market, and advocacy to signal what changes are needed in subsidies and incentives to make this a reality.

Uptake of protein alternatives and new plant-based proteins requires a **revolution in how we make and eat food based on new culinary skills** which, to date, have only been a focus for a few food service companies.

Most importantly, for true mainstream transformation, **pre-competitive action is essential**. Working together with others can reap huge benefits: or example, look at the impact of organisations joining together to deliver against time-bound commitments on zero-deforestation through collaborations such as The Tropical Forest Alliance 2020.

The narrative emerging from businesses is slow to mature into one that includes both **sustainability and nutrition as explicit goals**. This is needed to deliver good outcomes for people and planet, and to prevent any unintended consequences, or a consumer backlash. And, despite a number of food businesses and retailers setting climate targets that cover their supply chains, few are publicly making the connection with their protein portfolio, potentially missing opportunities to lower emissions through development of alternative feed or rebalancing product portfolios towards plant protein.

SHAPE UP FOR THE NEW PROTEIN SYSTEM: A FIVE-POINT PLAN

There is huge potential on the horizon for companies to lead a transformative shift anchored around sustainability, health and nutrition and to send a strong demand signal for change via integrated public strategies and commitments. Here we present five key recommendations to drive truly transformative action:

1. Develop an integrated protein strategy:
Develop an integrated protein strategy that puts sustainable nutrition at the centre of delivering healthy diets, links to corporate climate targets and covers key protein impact areas.

2. Make public, time-bound commitments:
Make public, time-bound commitments to shift to sustainable animal feed that send clear signals to the market.

3. Embed across the business:
Focus resources on understanding the shifts needed across all consumer product portfolios to embed and enable healthy balanced diets, and how to align this across all business functions with a supportive business model, led from the top.

4. Collaborate:
Identify and collaborate on pre-competitive challenges, from shifting our food culture and transforming across the value chain to creating an effective enabling environment for scaling sustainable animal feed.

5. Advocate for change:
Advocate for change across the food sector, engaging policymakers and institutions. With 10 years left to address the climate challenge, businesses can play an active role in engaging policy makers, investors, funders and NGOs to accelerate action - sending a clear signal for outcomes that deliver both sustainability and nutrition outcomes and shifting incentives in the market.

Policy makers, **trusts and foundations**, **investors**, and **NGOs** can also be part of leading and accelerating progress on this critical challenge by assessing their role using tools such as Forum for the Future's Scaling up Impact framework featured below.

Figure 4: Forum for the Future's Scaling Up Impact Framework highlights key actions needed from trusts & foundations, policy makers, investors, and other convenors of change in order to enable systemic change on protein.

CALL TO ACTION

We can be sure that the future of food will look very different and business as usual is not an option. Food businesses need to urgently future-proof themselves and their supply chains by moving beyond the current surge of product innovations to deliver integrated protein strategies that cover the production as well as consumption of protein and actively drive better outcomes for sustainability and nutrition.

What will food businesses look like when sustainability is mainstream and our value proposition is based on nutritious, affordable protein consumption?

Today's business leaders can shape that future. Many in the food industry are already starting to take a leading stance; what is your role in this rapidly changing picture?

To access the full toolkit for protein businesses and enabling organisations visit www.forumforthefuture.org/the-future-of-food

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1. INTRODUCTION

1.a. THE CLIMATE CONTEXT

The world is growing ever more aware of the urgent climate challenge. With roughly a decade left, we need to accelerate action fast if we want to remain below the 1.5˚C of warming that science warns could send us beyond the earth's tipping points and lead to irreversible and catastrophic climate change.[1] How we manage land use - two fifths of which is used for agricultural production[2] - is a critical part of that picture. Yet the world needs solutions that don't just solve the climate crisis, but which fundamentally build a sustainable future for food, for people and for the planet. This requires taking into account social and economic as well as other environmental parameters beyond climate.

In 2015, Forum of the Future and its partners started to see signals that protein - an essential part of our diets but also at the heart of the climate challenge and a number of other critical sustainability issues - was becoming a focus for major transformation. For example, livestock currently accounts for 14.5% of greenhouse gas (GHG) emissions globally and, if the number of livestock (and particularly ruminant animals, such as cattle, sheep and goats) continues to grow on its expected trajectory and production practices remain the same, the cumulative emissions between now and 2050 could be equivalent to one third of the total remaining 1.5˚C carbon budget.[3] At the same time, much of the fertiliser applied to boost protein production ends up as a pollutant in waterways and pressure on our natural ecosystems is at breaking point with future demand for animal feed expected to require up to 280 million hectares of additional land by 2030.[4] Action targeting the protein system could make significant contributions towards a number of Sustainable Development Goals (SDGs), including SDG 3 Good Health and Welbeing, SDG 13 Climate Action and SDG 15 Life on Land.

The response was the '**Protein Challenge 2040**' - a multi-stakeholder initiative facilitated by Forum for the Future, working pre-competitively with NGOs and businesses across the sector to transform the food system. The Protein Challenge takes a systemic approach to testing, learning and ultimately catalysing change towards a key challenge:

How do we provide up to 10 billion people with enough protein in a way that is healthy, affordable and good for the planet?

1.b. A FOCUS ON FOOD AND FEED

The Protein Challenge mapped the supply chains for animal- and plant-based protein and identified six key levers for change. These have formed the basis for its two priority workstream areas - which in turn form the backbone for this report, alongside a deep dive into whether businesses are developing integrated protein strategies:

Focus Area 1: Rebalancing protein in Western diets

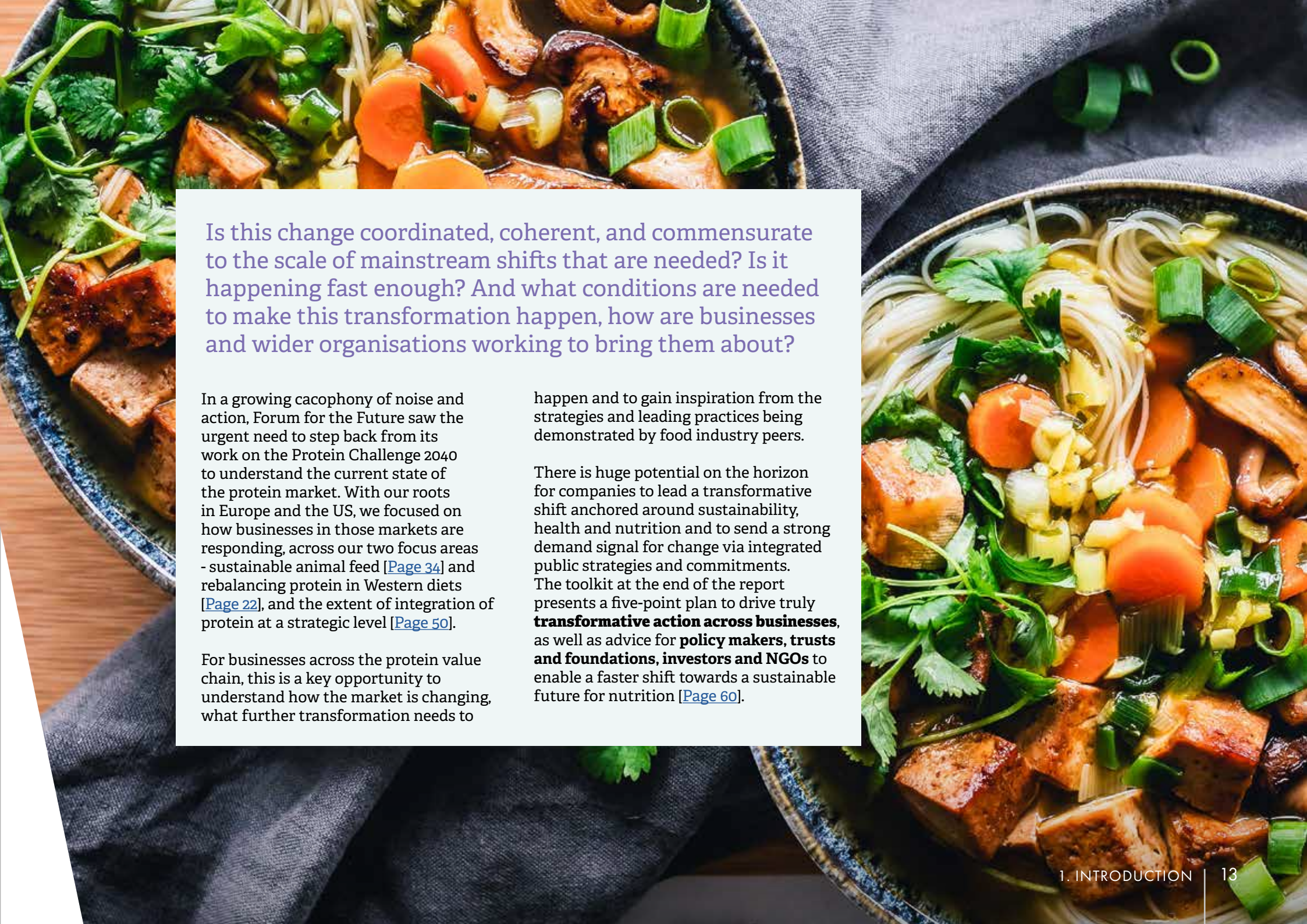
Key scientific research has emphasised the need to rebalance and diversify diets in developed countries towards a greater proportion of plant protein in order to meet the urgency of our global challenges.[5,6,7] This research points to the fact that livestock currently accounts for 14.5% of global GHG emissions and the key opportunity to significantly reduce pressure on land and resources by bypassing the inefficiency of feed-food conversion ratios.

Focus Area 2: Sustainable Animal Feed

Animal feed sits at the nexus of the key issues related to animal production,[8] including overall accounting for 45% of the GHG emissions associated with livestock production. It is an important proxy for whether companies have understood their material impacts in relation to animal production.

In recent months, attention to food and climate change, and protein specifically, has increased dramatically. From growing excitement around new alternative protein sources for feed and food such as insects, the establishment of major initiatives such as Food Reform for Sustainability and Health (FReSH), and a public debate raging around the future of meat in our diets, concern about protein is growing.

We are beginning to see innovations come to market for animal feed, such as the use of algae as a protein source, or more traditional forage crops being incorporated, such as clover. And a week rarely goes by without the launch of a new plant-based range from retailers, food manufacturers, food service and more recently, meat processors.



Is this change coordinated, coherent, and commensurate to the scale of mainstream shifts that are needed? Is it happening fast enough? And what conditions are needed to make this transformation happen, how are businesses and wider organisations working to bring them about?

In a growing cacophony of noise and action, Forum for the Future saw the urgent need to step back from its work on the Protein Challenge 2040 to understand the current state of the protein market. With our roots in Europe and the US, we focused on how businesses in those markets are responding, across our two focus areas - sustainable animal feed [Page 34] and rebalancing protein in Western diets [Page 22], and the extent of integration of protein at a strategic level [Page 50].

For businesses across the protein value chain, this is a key opportunity to understand how the market is changing, what further transformation needs to happen and to gain inspiration from the strategies and leading practices being demonstrated by food industry peers.

There is huge potential on the horizon for companies to lead a transformative shift anchored around sustainability, health and nutrition and to send a strong demand signal for change via integrated public strategies and commitments. The toolkit at the end of the report presents a five-point plan to drive truly **transformative action across businesses**, as well as advice for **policy makers, trusts and foundations, investors and NGOs** to enable a faster shift towards a sustainable future for nutrition [Page 60].

1.c. OUTLINE OF THE RESEARCH

The research aimed to understand:

Does the current action in protein add up to a big enough change to meet our global challenges?

Are businesses ready to deliver a sustainable protein system and what action is needed to make this transformation happen?

What questions did we ask?
We looked across the protein production and consumption activities of businesses as well as taking a more high level view of how protein sat within their broader climate and health strategies. We aimed to understand how they were addressing structural and cultural barriers to achieving a sustainable protein system. Action and commitments were measured for the following three areas:

- **Focus Area 1: Rebalancing protein in Western diets.** Are companies enabling rebalancing of diets towards a more diverse selection of proteins - especially plant proteins?
- **Focus Area 2: Sustainable animal feed.** Are companies engaged with livestock protein working to enable sustainable animal feed?
- **Integrated protein strategies:** Are companies taking an integrated approach to protein in their business overall strategies?

There were many other areas that we could have focused on. Animal feed is a significant component of a wider shift towards sustainable livestock systems, and management of fish stocks and aquaculture is, and will continue to be, a significant sustainability challenge. The type of packaging used at different stages in production and consumption needs to transform, as do energy and water use in the creation of finished products, not to mention the management of protein waste and our overall levels of protein consumption.

What type of organisations did we include?
We looked at the public actions and commitments of businesses across protein supply chains that either had direct impact on one of the two focus areas, or could indirectly influence them through sourcing policies, product development or marketing activities. We also looked at the role policy, investment and convening organisations could play in supporting the transformation:

We included the biggest global feed, meat and dairy producers and integrators based on global turnover, resulting in an international spread of businesses across these two sectors. When selecting businesses at the consumer facing end of the protein system, most of the largest global businesses were based in Europe and the US. As a result, the companies included in this part of the supply chain have a Western bias and the questions we asked around diets focused mainly on rebalancing Western diets to be affordable, sustainable and nutritious. A full list of businesses included in the report - including main region of operation and sector breakdown - is available in Annex 7a.

Figure 1. Number of businesses by sector included in the research scope and how they directly or indirectly influence the two focus areas of delivering sustainable animal feed and rebalancing protein in Western diets

Policy makers, investors, conveners of change, trusts and foundations:
Influence the system through policies, regulations, incentives, collaborations, 1:1 engagement, funding decisions

What activities did we include?

When measuring actions, we only included commitments, intentions or activities businesses were publicly undertaking through their company website or media coverage. We anticipate that some companies are more active in developing strategies for sustainable protein but have not communicated their plans publicly, so they are not counted in this report. Public commitments are important as a signal to suppliers, investors and policy makers, and help businesses to control their risks by engaging other stakeholders that they rely on in the food system.

Where drawing on examples, they have been chosen to highlight commitments made by businesses towards sustainable protein. The research does not incorporate a view on progress against those objectives, nor do they equate to an endorsement by Forum for the Future, The Protein Challenge 2040 or its collaborating partners.

For further information on the research methodology, including limitations, wider sources and the full list of companies included in this research, please see Annex 7.a.

2. WHY IS PROTEIN A HOT TOPIC: WHAT IS DRIVING BUSINESS ACTION?

2.a. INCREASING RECOGNITION OF THE ROLE OF PROTEIN IN FIGHTING CLIMATE CHANGE

Protein became a focus of attention in relation to climate change after scientific research flagged its production and consumption as a significant contributor to GHG emissions. Livestock production, which the USA, Australia, New Zealand, Europe and parts of South America in particular are heavily reliant on as a protein source, globally contributes to 14.5% of GHG emissions.[9]

If we are to remain with a 1.5˚C trajectory for global warming, current production and consumption habits will need to change. This is particularly urgent as Asian markets also shift towards a higher per capita consumption of meat and dairy.

There are many identified routes available to improve the climate impacts from livestock production, such as decoupling soy meal production from deforestation (over 70% of global soy production is used to feed animals[10]), using advanced additives to improve conversion of feed into energy, or raising grass-fed livestock such as ruminants under conditions that promote significant carbon sequestration in soil. Solutions are often context specific, but the need to prioritise more climate-friendly livestock systems is clear.

Evidence also suggests that the balance of protein sources we eat will need to change too; diets highly reliant on meat, fish and dairy will need to be rebalanced to incorporate a greater diversity of proteins, especially plant protein.[11,12] This has led to some advocating for a 'less and better' approach to meat and dairy consumption.[13]

The planet cannot sustain the impact of a 'business as usual' approach to protein production and consumption and these demands are only expected to rise.

Governments are starting to take decisive action on climate change in ways that impact the food system. 61% of countries that submitted targets ('Nationally Determined Contributions') under the Paris Agreement included 'land use, land use change and forestry'.[14] The UK was the first to commit to a legally-binding target of net zero GHG emissions by 2050.[15] These targets cannot be achieved without significant changes to the way that these countries grow their food, where it is grown, and what they choose to eat.

Indeed, we are seeing signs of a movement building: with the National Farmers Union in the UK committing to a net zero carbon transition strategy; the city of New York's Green New Deal committing to phase out processed meat and reduce beef consumption by 50%; and 14 global cities signing the C40 Good Food Cities Declaration committing to achieve a 'Planetary Health Diet' for all by 2030.[16]

2.b. RACE TO KEEP PACE WITH NEW PROTEIN INNOVATION

Plant-based alternatives to meat have been available for a long time. For example, the UK brand, Quorn, has been producing mycoprotein (a form of protein cultivated from fermenting fungus) since the 1960s and continues to innovate and lead in the plant protein space. More recent advances in gene editing technologies as well as newcomer innovation focused on mimicking the taste and texture of meat have given rise to the development of a wide variety of animal-free meat products that aim to resemble 'the real thing'. From plant-based burgers that 'bleed'[17] to tuna made from stem cells[18], these innovations reflect the rapid action and greater competition amongst businesses to be ahead of the curve.

Research from the Good Food Institute (GFI) shows that US $73.3 million has been invested in cell-based meat companies since 2015. Of the 27 cell-based meat companies analysed by the GFI, 11 were founded in just 2018.[19] Israel's Innovation Authority has also sought to stimulate food-technology companies through grants and the financing of a US $25 million food-tech incubator – supporting Israel's development as a hub for cultured meat.[20]

The plant-based industry has seen US $17 billion investment, with US $13 billion invested in the past two years.[21] The Canadian government has even made plant-based protein one of its investment superclusters.[22] With retail sales of plant-based foods growing by 17% in the US over 2017-2018 (while total US retail food sales grew by 2%[23]), the demand for protein innovation and from customers to 'try something new' is a powerful driver for change.

WHY IS PROTEIN IMPORTANT IN OUR DIETS?

Amino acids – the building blocks of protein – are critical components of our diets. They form the basis of biological function, from replicating DNA, to producing antibodies, to forming hair and muscle. Because we cannot synthesise all of the amino acids our bodies need, protein must be supplemented from our diets. These so-called 'essential' amino acids (those we must get from our diet) can be obtained from both plant and animal based protein. However, different sources can have different qualities of protein - each has some (so-called 'incomplete') or all of these essential amino acids ('complete') but in different proportions, densities, bioavailability profiles (what actually gets turned into body mass from food) and 'packaged' with a different combination of other nutrients.

Each person, in turn, has their own dietary needs which depend on many factors, including age and level of activity. And while many people eat much more protein than required (often 20% more than recommended by nutritional guidelines in Western countries[28]) others suffer from under-nutrition in protein, as well as 'hidden hunger' due to other micronutrient deficiencies.[29] In some of these geographies, efforts need to focus on increasing the access and availability of high quality protein and the consumption of animal-based protein may need to increase. Working towards a balanced diet for our growing global population is therefore highly context-specific.

2.c. CHANGING CONSUMER AWARENESS OF ISSUES ASSOCIATED WITH PROTEIN

The provenance of food has become a fashionable topic. Widely viewed documentaries like Cowspiracy and an influx of new reports around the impacts of meat and dairy, such as the high-profile EAT-Lancet Commission report,[24] have raised public attention toward the health, environmental and welfare challenges surrounding meat and dairy production. In many Western regions, we've also seen an increasing preference for locally sourced food and organic produce, with the organic sector in the UK predicted to reach £2.5 billion by 2020 after seven years of uninterrupted growth.[25]

Consumers are increasingly seeking the perceived nutritional and sustainability benefits of a more diverse diet, with a third of US consumers reporting to be lowering their meat consumption in 2018[26] and 14% of the UK population now identifying as flexitarian.[27] Businesses that fail to adapt to the rising demand for more diverse protein in diets risk losing out on the environmentally and health aware consumers of the future.

WHAT ARE THE COMPLEXITIES OF THE PROTEIN PRODUCTION STORY?

The World Resources Institute's (WRI) Cool Food Pledge calculates that reducing protein from ruminants (animals including cattle, sheep and goats) is the biggest opportunity to reduce carbon emissions related to diets. This is because ruminants have the highest resource requirements of any food we eat, producing more GHG emissions and using more land per gram of protein than other protein sources.[30] However, others highlight the importance of understanding these impacts alongside the potential value of ruminant animals - their ability to convert plants not fit for human consumption into a source of high quality amino acids, the density and quality that their meat provides of other nutrients like iron, as well as their role in soil and biodiversity management of grasslands.[31]

Currently, many of these ruminants as well as monogastrics (animals including chickens and pigs) and some farmed fish are fed higher quality proteins, some of which (e.g. soy) could have considerable nutritional value for direct human consumption. The loss of a significant proportion of the protein in its journey from crop, to animal, to human diet needs to be considered in relation to the added quality in terms of the essential amino acids and other micronutrients found in these animal based proteins.

The impacts from protein production aren't just felt in livestock production: there are also inefficiencies before protein gets into feed or food as much of the synthetic nitrogen applied via fertilisers to promote protein synthesis in plants leaches into our waterways.[32] Indeed, our distortion of the global nitrogen cycle is considered an even greater risk to exceeding our planetary boundaries than climate change by the Stockholm Resilience Centre.[33] Not addressing the nitrogen cycle at the same time as carbon emissions could result in significant unintended consequences.

Pathways to sustainable protein are therefore highly context-specific and require systemic thinking to avoid unintended consequences.

3. FOCUS AREA 1: REBALANCING PROTEIN IN WESTERN DIETS

THE CHALLENGE

In countries where there is a large amount of animal protein consumed and nutritional requirements for protein are generally exceeded, there is a recognised need to reduce overall protein consumption and rebalance diets towards a more diverse set of protein sources, especially plant proteins.[34]

Our current protein production systems have the potential to cause significant damage to the natural systems that agriculture depends on, such as climate, biodiversity and soils. This brings the future security of food supply into question at a time when rising incomes and population growth are driving increasing global demand for protein. While animal protein provides a rich source of nutrition, research highlights there may be an opportunity to bypass some of the inefficiencies of feed-food conversion by increasing the proportion of plant-based protein consumed (while recognising that this is about achieving a healthy balance that will look different for different people).[35] What's more, in the West, consumption-rich diets are currently associated with rising rates of non-communicable diseases, such as heart disease, stroke, diabetes, obesity, and certain cancers, providing an opportunity to drive better health outcomes as diets shift.

This report aimed to understand which strategies businesses are adopting to rebalance Western diets to more diverse sets of protein and how widespread is the transition? And, given the significant cultural significance of food, what barriers do businesses face in this transformation? How are enabling organisations supporting this change?

STRATEGIES

We found that the strategies businesses are employing for rebalancing protein in Western diets focus on three main areas:

a. Creating **meat and dairy substitutes** which recreate the textures and tastes of meat

b. Promoting **traditional plant protein sources and meals** that can have environmental and health benefits when consumed compared to animal-based protein

c. **Reformulating products** to contain less meat to reduce their environmental impact

While these strategies focus on increasing plant protein consumption, it is important to recognise their potential limitations when pursued in isolation, or without robust assessment of the environmental and health outcomes. For example, a recent study from the World Resources Institute found that, in the US, consumers are overall increasing their consumption of plant protein in addition to - and not instead of – their current intake of animal protein per capita (and although consumers seem to be eating less red meat, they are largely consuming more chicken instead).[36] This trend has implications for both health and the environment, potentially leading to increased calorie intake and growing rather than shrinking environmental footprints. This suggests that stronger action needs to be taken by protein companies, governments, conveners and civil society to fundamentally shift diets.

SIGNALS OF CHANGE

Sodexo launches Future 50 Food recipes
Sodexo has announced the roll-out of new plant based recipes, based on the "Future 50 Foods" list developed by Knorr and WWF to highlight a wide range of plant-based, nutritious, low-impact ingredients. Sodexo is rolling out the new recipes gradually, taking the time to train chefs to work with these new ingredients.[37]

Growth in plant-based dairy
There is equally strong growth in the more established plant-based dairy market, which is predicted to grow from US $17.3 billion in 2018 to US $29.6 billion by 2023.[40]

Growth of meat substitutes
There is strong growth in the global meat substitutes market, with sales of US $3.7 billion in the US last year.[38] Analysts predict the alternative protein market could reach US $100 billion in the US by 2035.[39]

Challenge to plant protein labeling
In 2017, the French government voted to place legal restrictions on the naming of products, so plant-based manufacturers could face fines of up to € 300,000 for using terms such as 'sausage' and 'steak' in the labelling of their products.[41]

KEY FINDINGS

Business commitments & actions: Rebalancing protein in Western diets

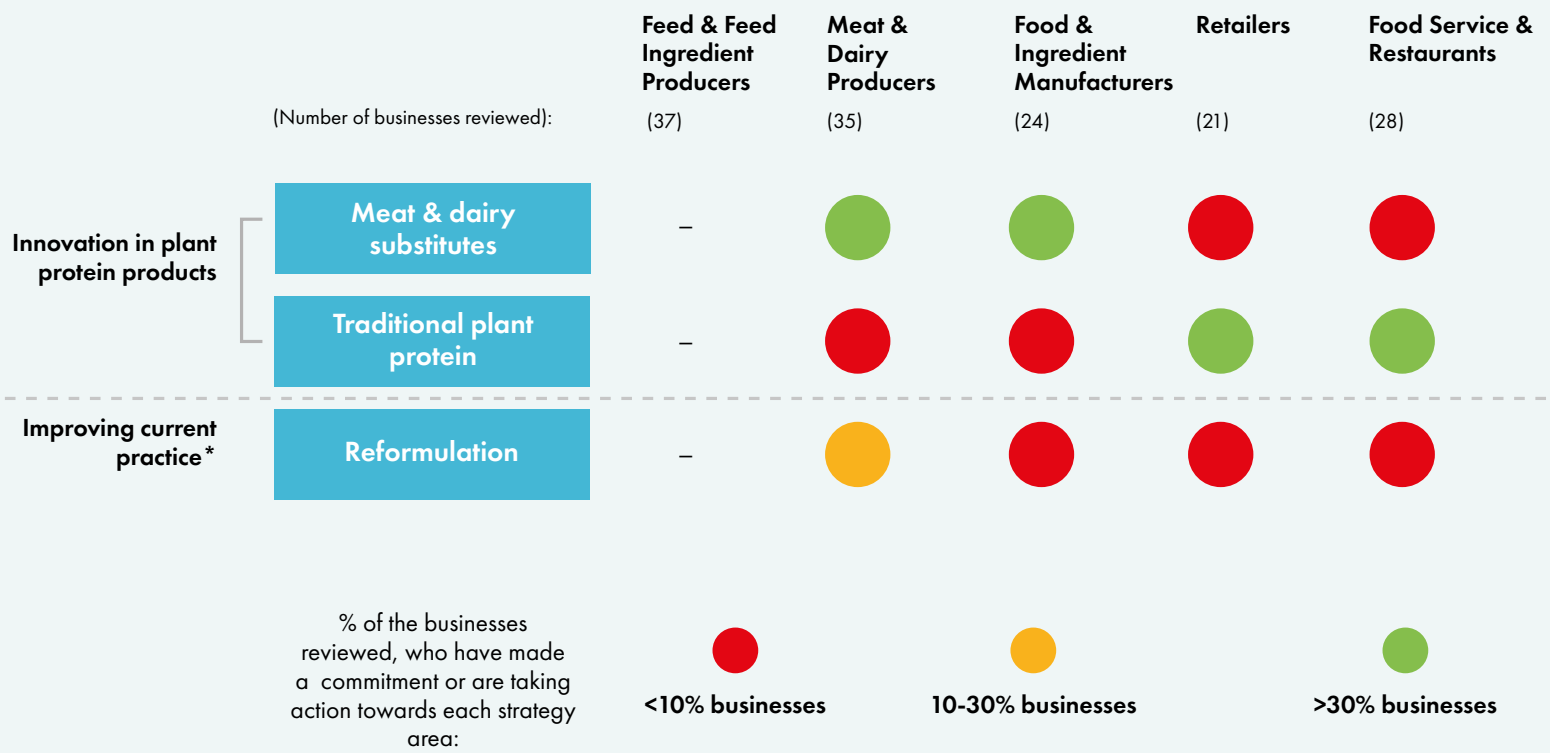


Figure 2: Traffic Light diagram showing the proportion of the 132 businesses reviewed in this report, that have made a commitment or were taking action towards each strategy area

Rapid product innovation is filling a much needed gap in the market, but much of this progress is happening against a backdrop of concurrent growth in meat sales with few significant moves to reformulate mainstream existing ranges or build sustainable protein into core business strategies.

a. Meat and dairy substitutes

- **Food and ingredient manufacturers** are actively acquiring or investing in smaller plant-based brands and launching their own innovations to fulfil emerging consumer needs and solve texture and taste hurdles, with 79% of the businesses reviewed in this report capitalising on the growth of this sector. However, most of their food products are meat substitutes such as burgers or sausages.
- **Meat and dairy producers** are beginning to diversify their portfolios to include a wider variety of protein sources, with a number of launches into plant protein in 2019. But most continue to invest heavily in growing their meat and dairy portfolio too, which could leave them stranded with large liabilities if consumer habits and government and investor policies continue to shift.

b. Traditional plant protein

- **Food service** providers have made some of the most significant progress across the businesses we looked at, with new plant-based meals added to menus and commitments to invest in upskilling chefs with the techniques required to deliver delicious, nutritious plant-based meals, often supported by education programmes for employees and the schools or workforces they are operating in.
- **Retailers** are developing more plant-based meals, where recipes are built around vegetables or pulses rather than a meat substitute. **Retailers** already play a key role in mainstreaming food trends and influencing food cultures, but we're yet to see most mainstream retailers make sales-based commitments to rebalance their ranges to be more plant focused, and engage the full extent of their resources across marketing, innovation and product placement in store to support this.

c. Reformulation

- We are seeing the introduction of new "blended meat" products, such as mince containing both meat and vegetables, from a few large **meat producers** and **retailers**, but limited reformulation of existing products to rebalance their protein content from major **food manufacturers**.

ENABLING SYSTEMIC ACTION

Despite major marketing trends around protein, one of the greatest barriers to positive change is getting consumers to recognise a wider range of foods as nutritious sources of protein.

A number of **governments** are now advocating change by adapting dietary guidelines that specifically incorporate sustainability considerations[42] and a broader view of protein as well as introducing sustainable protein public procurement policies that stimulate the market,[43,44] but progress in this space overall is slow and greater action from more countries is needed.

There may be a key role to play for **governments** as well as businesses to support supply chains to transition to livelihoods based on sustainable protein production. For example, there have been proposals for including plant protein in the CAP (Common Agriculture Plans) strategic plans in the EU to boost production in response to the rapidly evolving protein industry.[45] Going forward, **policy makers** will need to play an important role in supporting a just transition to help the farming base cope with any stranded assets, which could include a shift towards renewable energy infrastructure or conservation for tourism, amongst other alternatives.

There could also be a role for **media and influencers**, such as well-known athletes, in inspiring people to try a new diet. Influencers already contribute significantly to promoting new products and in some countries educating people about government campaigns or policies. For example in Singapore, the Ministry of Finance used influencers to educate its population about the 2018 budget[46] and in Australia, influencers were used as part of a National Health campaign to increase physical activity amongst women.[47]

Investors can engage companies around the risks from the proportion of their portfolios that are not yet diversified and the opportunities available in increasing the plant protein segments. They can also support the more structural changes required in the sector, such as financing more plant-based processing capacities.

Accelerating the trialling of new practices and delivering alternative protein at scale could also be a crucial role of **trusts and foundations**, as well as governments providing targeted funds for innovation.

Investing in meat and dairy substitutes

% of companies investing in plant protein through acquisitions, investments or launching innovation

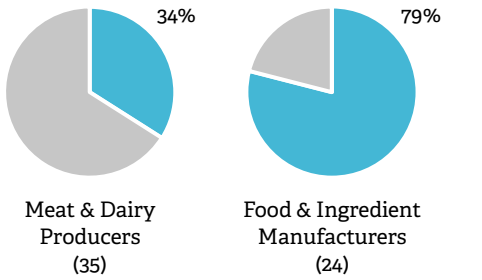


Figure 3: Proportion of meat and dairy producers and food and ingredient manufacturers that have extended their existing range of plant protein products or have launched, invested in or have acquired new plant protein brands.

3.a. MEAT AND DAIRY SUBSTITUTES

The explosion of plant-based products mimicking meat and dairy textures and tastes is helping to shift consumers' diets, but some are voicing concerns about potential unintended consequences

Many consumers are increasing their plant-based consumption with the promise of products that mimic the textures and tastes they are used to from meat and dairy. 79% of food and ingredient manufacturers have launched, acquired, or invested in plant protein brands - most notably launching alternative dairy products or plant-based burgers that seek to recreate the taste and feel of beef burgers as closely as possible. These are now entering the mainstream as **fast food chains** all launch their chosen version, such as the Impossible Whopper (from Impossible Foods) at Burger King.[60] These meat and dairy mimicking products can provide a useful bridge for consumers to plant protein.

But there are concerns that action to drive rebalanced protein consumption could lose sight of health and sustainability outcomes. Alternatives, such as chicken-style nuggets or plant-based burgers, don't necessarily have equivalent nutrition profiles to their meat or dairy counterparts and creating or reinforcing perceptions of plant-based dishes as being inherently more healthy could in due course undermine the growth in this sector ("vegan junk food" is still junk food). Equally, some have voiced concerns that assessments of environmental or social impacts haven't been undertaken for many alternative products and that this risks unintended consequences from a dietary shift.[61]

The summer of 2019 saw a flurry of plant protein launches and commitments from some of the biggest **meat producers**, including JBS, Marfrig and Vion. Over a third (34%) of the **meat and dairy producers** and processors that were viewed have now launched, acquired or invested in new plant protein brands. Tyson was an early mover in this space, with its investment in Beyond Meat, mushroom-based protein producer Myco Technology, and its investment in cellular meat company Memphis Meats which may be a signal of an acceleration of cell-based meat development in this area.[62]

There is less visible activity in **Asia**, where the policy and regulatory space is fragmented and consumers often struggle to afford this type of processed alternative. However, there are some significant signs of movement, with Monde Nissin, a major Asian food business, actively expanding into the plant protein space through its acquisition of Quorn. Singapore-based and government-linked Temasek has invested millions in Impossible Foods[63] and China's vegan sector is expected to grow by 17% between 2015 and 2020, too.[64]

EXAMPLE: ACQUISITION, INNOVATION AND INVESTMENT IN ALTERNATIVE PROTEIN

Tyson has invested in a number of plant protein and cellular meat businesses:

Cellular meat: Memphis Meats and Future Meat Technology
Mushroom-based protein: Myco Technology
Plant-based seafood: New Wave Foods

Tyson also launched its own blended meat brand Raised & Rooted, which combines meat and plants.

They have positioned themselves as a protein brand, with CEO Noel White explaining:
"Today's consumers are seeking more protein options so we're creating new products for the growing number of people open to flexible diets that include both meat and plant-based protein"[67]

Nestlé set an ambition to:

"launch more products that have a better environmental footprint and contribute to a balanced diet. Nestlé will also look to reformulate its products using more climate-friendly ingredients. Consumer demand for such products is rapidly increasing, and Nestlé's core strategy is in line with this shift."[65]

In line with this ambition, Nestlé acquired the plant-based foods manufacturer, Sweet Earth, in 2017, further expanding its range of vegetarian products.[66]

3.b. TRADITIONAL PLANT PROTEIN

Alongside the surge in availability of meat and dairy substitutes, meals based on traditional plant-based ingredients such as pulses and vegetables are also becoming more available in retail outlets and canteens across the Western world and especially in Europe.

A number of leading culinary schools, such as Cordon Bleu, now offer stand-alone plant protein cooking courses to better equip chefs with skills to work with plant ingredients in response to growing consumer demand.[48] However, we don't yet see those courses or skills being embedded into mainstream chefs' training as standard - they remain standalone, additional courses. A number of initiatives have recently emerged to attempt to address this, offering tools and guidance on how to mainstream plant-forward cooking amongst culinary professionals, including piloting of a new culinary curriculum as part of the Protein Challenge 2040[49] and the "Menus of Change" initiative by The Culinary Institute of America and Harvard T.H. Chan School of Public Health.[50]

EXAMPLE: EXPANSION OF PLANT PROTEIN MENUS

Sodexo

The global food service business is actively expanding its plant based menus across the US and EU.

Launch & championing of plant forward menus[51]
Committed to refine recipes to be more plant powered and develop plant forward meals:

- "In Germany, Austria and Switzerland, launched Peter + Silie menu - with great vegetarian and vegan recipes, offering nature's bounty with its seasonably changing menu and emphasis on sustainability. Michelin star chef Roland Trettl partnered with Sodexo chefs to develop more than 110 vegetarian and vegan recipes.
- Plant forward recipes now available in the core menus for restaurants within Universities, Healthcare and Corporate Services (Business & Industry) in the USA.
- Lean and green menus in Austria with a focus on minimal processing as well as plant forward meals."

39% of **food service companies** reviewed were making clear public declarations towards increasing the amount of plant-based meals they serve. A further 21% were highlighting vegetarian or plant-based options through their websites.

Many food service companies operate canteens run through public procurement services in schools, hospitals and workplaces. With 14 global cities signing the C40 Good Food Cities Declaration in September 2019, committing them to achieving a 'Planetary Health Diet' for all by 2030,[52] we're starting to see public procurement look at how to rebalance meal options.

The Protein Challenge 2040 is working with school districts in the US who are interested in increasing the plant options they offer as part of the National School Lunch Programme by collaborating with food manufacturers to develop more plant protein products for a school setting, within cost constraints. This is combined with a behaviour change campaign to drive uptake of the new meals.[53]

Expanding plant protein offering

% of companies making public commitments towards expanding plant protein offering or providing a clear offering through their websites

Figure 4: Proportion of retailers and food service businesses or restaurants that have a clear, easy to find plant protein offering on their website, or are publicly talking about increasing the proportion of plant protein meals available in their menus or stores

Retailers have been active in widening their plant-based ranges, especially in the UK, with 38% offering a distinct range of plant-based products through their websites and 14% making public commitments to increase the range of plant products further.

Some **retailers** are experimenting with where they position these items in stores. For instance, Kroger's Simple Truth products are placed in the meat aisle in selected stores as part of an experiment to understand the impact location has on sales of meat substitutes.[54] Tesco also has a clear strategy to increase plant protein ranges across all price points and is locating plant protein products both in the meat aisle to offer flexitarians an immediate alternative to meat, and in dedicated plant-based and vegetarian zones in stores.[55]

In contrast to the commitments supermarkets are making towards lowering salt, fat or sugar in their products (usually in line with national government targets), rebalancing their protein products to reflect government nutritional guidelines is not yet an area retailers are sharing time-bound commitments on. With a number of recent reports, such as "Better by half: A roadmap to less and better meat and dairy" from Eating Better Alliance, calling for retailers to set sales based targets around healthy foods and report turnover from different sources of protein, this could be an area we see develop further in the near future.

EXAMPLES: INNOVATION IN PLANT PROTEIN MEALS

Kroger have launched new plant protein products as part of their Simple Truth Range, promoting both the health and sustainability benefits of a flexitarian diet:

"As more of our customers embrace a flexitarian lifestyle, choosing to prioritize healthier food choices and reduce their environmental footprint, we are excited to meet their needs "[59]

M&S have set a time-bound commitment to expand their plant protein range and launched their Plant Kitchen range as part of delivering on this target:

"By 2020, we'll have **grown a comprehensive range of vegetable-based protein** convenient meal solutions and components for cooking"[58]

M&S is notable for having made a public commitment to increasing its range of vegetarian meals in its Plan A strategy, while Tesco is an example of a business aiming to deliver a systemic integrated change, with a commitment to "help customers eat more sustainable diets", with " the widest and best range of plant-based options available on the UK high street",[56] alongside its major commitment with WWF to halve the environmental impact of the average shopping basket.[57]

3.c. REFORMULATION

Meat producers are leading on reformulation - launching blended products containing more vegetables and less animal protein.

By reducing the quantity of animal protein in products, businesses can engage flexitarians while reducing land use pressure and GHG emissions. This is seen most recently in the emergence of a new sector of blended meat and vegetable products. Global meat producers Tyson, Perdue, Applegate and Danish Crown all launched products of this kind in 2019.[68]

There is little evidence of businesses reformulating existing dishes to reduce their meat content. This may reflect the difficulty in matching the cost realities with consumer perceptions around the value of vegetables and pulses compared to meat, as well as challenges in maintaining textures and tastes associated with those dishes. Businesses however may be adapting existing meals, but not explicitly highlighting this course of action publically, thus out of reach of this research.

EXAMPLE: BLENDED MEAT INNOVATION

Perdue launched a blended meat range, Chicken Plus, with Eric Christianson its Chief Marketing Officer announcing they are aiming for their:

"vegetable-enhanced items to become **a $100 million segment within five years**, making up around 5% of the company's overall business"[69]

4. FOCUS AREA 2: SUSTAINABLE ANIMAL FEED

THE CHALLENGE

As outlined in the Protein Challenge 'Feed Behind Our Food'[70] report, animal feed production and processing accounts for approximately 45% of the GHG emissions associated with livestock production (with land use change, which varies significantly by region, being a major cause of these emissions).[71]

Globally, agricultural expansion has come at the expense of forest, wetland and grassland habitats that provide benefits such as regulating water quality, carbon storage and biodiversity. Meeting future demand for animal feed using current feed sources will require an estimated 280 million hectares of additional land by 2030,[72] a target that is impossible to meet with existing protein crop sources. The sustainability of the sector relies on feed being produced with greater efficiency within agricultural systems designed to be less extractive and more restorative (in terms of biodiversity impact, GHG emissions, water regulation and pollution, particularly from nitrates) not to mention supporting livelihoods and human rights along the supply chain. This will be critical for meat and dairy to be seen as part of a sustainable diet. Feed crops are also vulnerable to price volatility, as the risk of extreme weather events gets more acute.

But how many businesses have strategies designed to deliver these outcomes?

And, which barriers do businesses face in this transformation and how are they and enabling organisations addressing them?

STRATEGIES

We found a number of strategies being used by businesses to shift feed to a more sustainable path and focused our analysis around the following:

Improving current practice:

a. Increasing the **sustainability of existing feed** through more responsible sourcing. For example, zero deforestation commitments, sourcing local feed crops, using certified sustainable fishmeal and oil or reducing fishmeal altogether.

b. Integrating livestock into regenerative farming systems that use **diverse forages**, focusing on land less-suited to growing food direct for human consumption.

Innovative solutions:

c. Driving **efficiency** and incorporating **feed additives** to reduce the quantity of protein required in feed, and nitrogen and phosphorus losses.

d. Using **waste**, **co- and by-products** not fit for human consumption in feed, supporting more circular, closed loop methods and reducing the land required to grow feed.

e. Scaling-up **novel feedstocks** such as algae, single cell proteins and seaweed which can reduce land use pressures and deliver other sustainability benefits, such as water efficiency and reduced GHG emissions.

Businesses are also looking at other approaches that aren't covered in detail in this report, especially around regenerative farming practices with reduced agrochemical inputs, nitrogen pollution and GHG emissions and integrating livestock into these systems, optimising stocking density and rotational grazing. All of these strategies sit alongside other commitments and activities such as genetically modified organisms (GMOs) or animal welfare, that have not been included in this report but which also inform corporate approaches on feed.

Focusing on one single solution within animal feed is not enough to meet the challenge. The Feed Compass Principles were developed by Protein Challenge 2040, to contribute to transformation to a sustainable food system. They outline the key attributes of sustainable animal feed and provide a basis for business to decide on which feed transformation strategies are best for their context, rather than focussing on single-issue wins, or solving crisis issues.

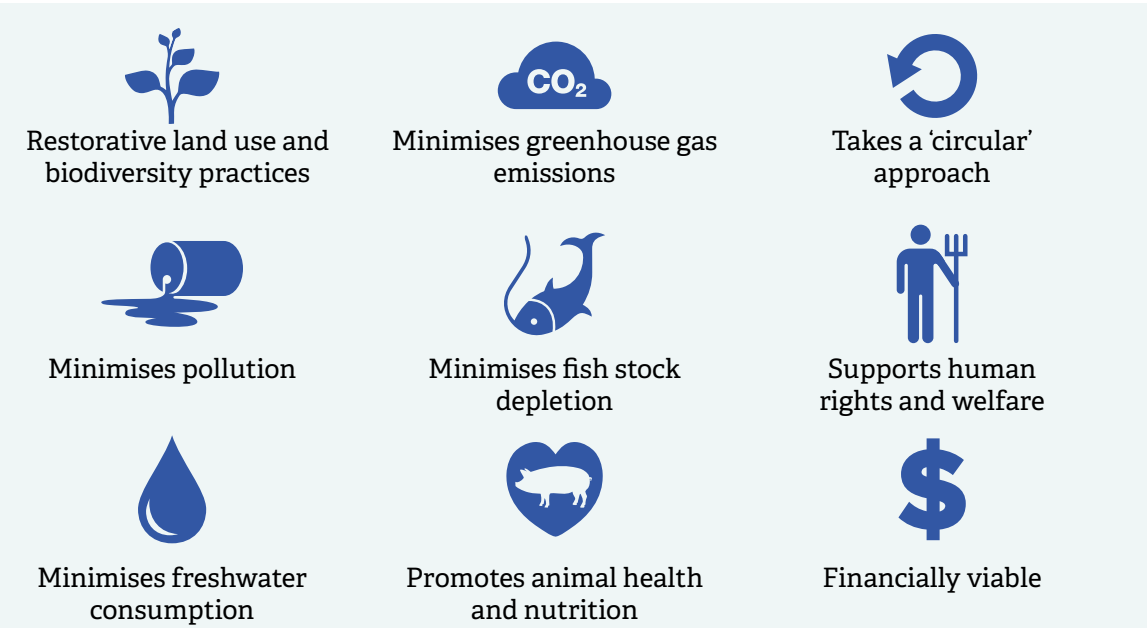


Figure 5. Feed Compass: Qualities of Sustainable Animal Feed. Lists the key principles behind sustainable animal feed as defined by Feed Compass working group from Protein Challenge 2040

SIGNALS OF CHANGE

Insect regulation developments
In July 2017, new amendments to EU legislation authorised certain insect proteins for use as feed in aquaculture. While it's still not possible to feed poultry and pigs with insect-based feed, this may change following recent feed trials.[73]

China looks to reduce feed demand
China is looking to reduce feed demand as one of the strategies to reduce its reliance on imported soy in the wake of American trade tariffs.[75]

Call for development of "new" proteins
In the wake of the 'EU Plant Proteins' report, the EU umbrella organisations for the algae (EABA) and insect production sectors (IPIFF) jointly called for a wide EU Action Plan to boost the development of 'new' proteins sources in Europe. These new proteins could play a role in reducing nutrient deficiencies in animal feed formula, as well as offering an alternative to soy or even be used to complement consumers' diets.[74]

New additives reduce methane emissions in cattle
A red seaweed-based additive from Blue Oceans Barns recently won an "Empower Possibilities" pitch funded by Mars and Land O'Lakes, after demonstrating it could reduce methane emissions from dairy cattle by 60%.[76]

KEY FINDINGS

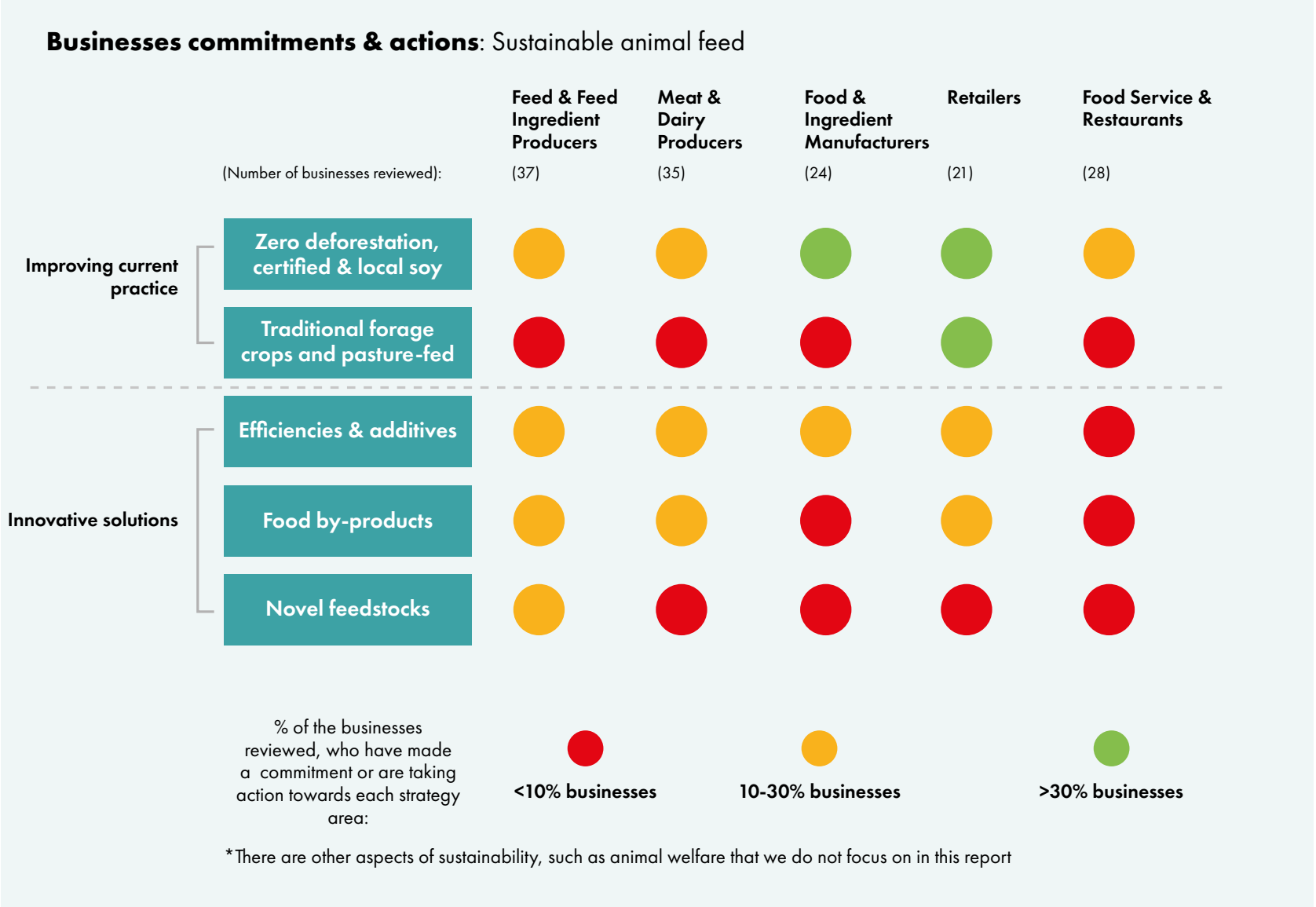


Figure 6: Traffic Light diagram showing what proportion of the 132 businesses reviewed in this report, have made a commitment or were taking action towards each sustainable animal feed strategy area

Action on feed - beyond commitments to single issues like deforestation - is still in its infancy and without public commitments, mainstream transformation could still be a long way off.

a. Zero deforestation, certified and local soy
Improving the sustainability of existing feed solutions through commitments towards zero deforestation or sourcing sustainable fish meal is one of the most widespread strategies found across food businesses. In this report we've focused on the most significant protein feed input, soy, where we found 46% of businesses have commitments towards sourcing local soy, certified soy or moving towards zero deforestation, especially from **food and ingredients businesses** and **retailers**, with 71% and 90% of the businesses reviewed in this report working towards these goals.

a. Traditional forage crops and pasture-fed
Interest in alternative, more sustainable feeds, is still low despite the increased investment in innovative start-ups. Forage crops, such as clover and grass pasture, mainly consumed by ruminants, have the lowest publicly stated support from businesses. Only 5% of businesses reviewed stated an interest in them, despite offering much untapped potential in terms of carbon reduction, efficient use of land and wider environmental benefits. Waitrose, a UK retailer, is one example of a business working with their beef, lamb and dairy supply chains to introduce home-grown forages through its Sustainable Forage Protein Project.

c. Efficiencies and additives
overwhelmingly focus on incremental efficiency improvements, which can also lower costs as well as reduce the quantity of feed input required. If overall production quantities continue to increase though, the environmental benefits of these efficiencies are lost.

d. Food by-products
Only 11% of businesses reviewed in this report publicly referenced incorporating food by-products unfit for human consumption in their feed strategies. However, this practice is likely to be under reported in the public domain, and could be particularly prevalent amongst smallholder farms in supply chains.

e. Novel feedstocks
Most of the commitments toward novel feeds in particular, such as insects or algae, come from the incumbent **feed producers**, with 24% of feed businesses reviewed in this report publicly exploring how they can incorporate these new innovations into their feed solutions. These new innovations remain more expensive and require greater structural change in the market to scale.

A significant number of businesses have made no public statement about sustainable animal feed, with most **food service** businesses and almost half of the **meat and dairy producers** reviewed in this report having no mention of it on their websites. The likelihood of a business making public commitments also varies by region. Asia is home to some of the largest global **feed producers**, but few are making public commitments towards sustainable feed.

The absence of public commitments from businesses could be driven by the perceived lower information requirements of their customers, but increasingly, investment communities and the public expect food companies to be more transparent about their environmental risks and strategies.

ASIA FOCUS

Of the largest feed companies globally, three of the top five are based in Asia[77], with Asia estimated to account for 30% of global annual compound feed production.[78]

The size of feed companies in Asia gives them tremendous influence over the future direction of global feed supply. Public commitments towards sustainable feed strategies could influence the region to develop supportive policies.

Currently, amongst the largest feed producers in that region, only CP Group has talked publicly about improving the sustainability of their existing feed, alongside divulging to CDP, a global environmental disclosure system.[79]

Leaders are using a combination of strategies, taking steps to transition to novel or alternative proteins while making commitments to ensure their existing supplies are more sustainable either through using additives, sourcing zero deforestation soy or delivering healthier soil, water and fertiliser management.

To decide where it is possible to contribute the greatest impact, businesses will need to take into account their local context and their role in the protein supply chain.

EXAMPLES: IMPROVING CURRENT PRACTICE AND EXPLORING INNOVATIVE FEED SOLUTIONS

Tulip, a global meat processor, has a multifaceted feed strategy, incorporating more traditional forage crops & food by-products, zero deforestation soy and efficient use of protein in feed.[80]

Here are some of the activities they outline on their website:

Traditional forage crops and food waste inputs

- "Encourage suppliers to replace imported soy by home grown peas or beans in pig diets.
- Reduce reliance on imported soy in feed.
- Explore ways of using more non meat food waste in animal feed - work with animal feed manufacturers to ensure sustainability of raw ingredients.

Optimise protein use in feed

- Target pig feed conversion ratios.

Zero deforestation commitments:

- Develop sustainable sourcing policy.
- Map supply chain to identify any sustainability hotspots.
- Reduce supply chain & bring more pigs under our direct control."

McDonald's, a fast food restaurant, are improving the sustainability of their existing feed supply, while also exploring alternative, more environmentally sustainable inputs.[81]

Here are some of the activities they outline on their website:

Novel Feedstocks

- "Work with suppliers and research institutes to support the development of novel alternative protein feeds, to reduce their reliance on soy for chicken feed and thereby help alleviate pressure on forests.
- Studies include insects and algae.

Zero deforestation commitments

- Purchase 100% sustainable certified soy by 2020 in Europe.
- Eliminate deforestation in supply chains for our beef, chicken (including soy in feed), palm oil, coffee and the fibre used in customer packaging by 2020.
- Eliminate deforestation from our global supply chain by 2030."

ENABLING SYSTEMIC ACTION

One of the biggest barriers to wider adoption of these animal feed developments is financial, with sustainable or local feed solutions often being more expensive in the current system than existing feed solutions.

With feed companies often operating to very thin margins and many smallholder farmers lacking the financial capacity to adopt these kind of changes, pre-competitive collaboration will be key to achieving a more widespread shift in feed strategies, which may require **government** support and sharing the costs with other stakeholders in the value chain.

Governments have a role to play in incentivising sustainable production and removing existing disincentives, with the ability to subsidise inputs, set productivity targets linked to feed quality and improved soil and water management, as well as making sure import/export trade tariffs and standards are aligned. **Policy makers** can also direct more funding to research into new technologies and incentivise or regulate for adoption of the most promising practices.

Investors could engage more with companies around what strategies they are using to shift their sustainability impacts across their animal feed and mitigate against the risks from climate change, land use pressures and price volatility.

Wider questions need to be posed around the value we place on good nutrition, animal welfare and sustainable livelihoods if we want to enable these structural shifts. These factors can often sit in tension with core business drivers for greater efficiency and lower production costs, and are likely to require considerable collective movement from across the protein system, including support from **trusts and foundations** to accelerate systemic change.

4.a. ZERO DEFORESTATION, CERTIFICATION AND LOCAL SOURCING

Almost half of all businesses reviewed report commitments towards sustainable soy in feed.

A large proportion of animal feed contains soy as its main protein source because it is cheap and nutritious with high yields. Yet the risks associated with soy production have increased with demand as growers seek to find new production areas – contributing to deforestation and the loss of other valuable ecosystems in South America, as well as monoculture production practices and, in turn, water and land pollution.

The few time-bound commitments we see being made by businesses on feed are around zero deforestation, sourcing Round Table of Responsible Soy (RTRS) certified soy or locally grown soy (in EU or US). **Food and ingredient manufacturers** and **retailers** are particularly active (71% and 90% respectively have commitments to certified or zero deforestation soy), with the commitments they make likely to catalyse further actions down the chain. The existence of collaborative initiatives and a relatively clear structure to work within to source certified sustainable soy may be a key driver of the higher uptake of this type of feed strategy from businesses at the end of the supply chain.

Even then, the number of companies actually making a commitment to some form of sustainable soy supply is surprisingly low in some parts of the chain, with only 32% of **feed companies** and a handful of the **food service** and **meat and dairy producers** we reviewed making time-bound commitments.

As the world contemplates the impact of the 2019 Brazil Amazon fires, we might expect to see more businesses making commitments in their 2030 strategies towards zero deforestation in their agricultural supply chains and sourcing responsibly sourced soy.

Reducing soy deforestation risk

% of businesses publicly stating time-bound commitments to zero deforestation, or sustainably certified or locally produced soy:

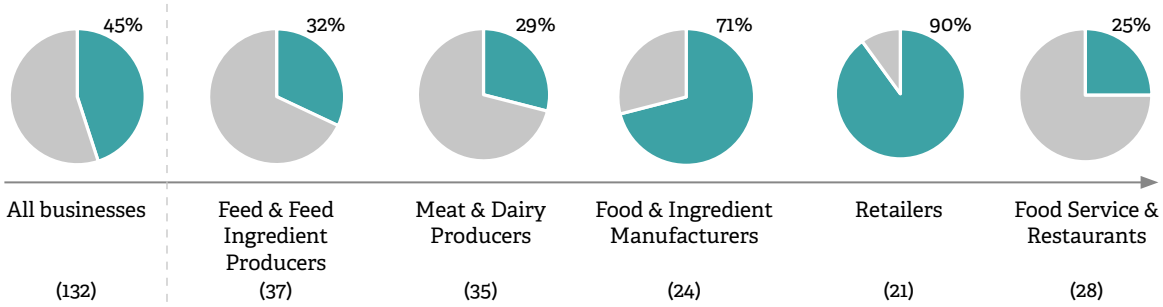


Figure 7: Proportion of businesses reviewed in this report, that have made a public, time-bound commitment to source sustainably certified, or zero deforestation accredited soy or local soy for use in animal feed, in their business or supply chain.

EXAMPLE: TIME-BOUND COMMITMENTS TO ZERO DEFORESTATION

ADM, a global food processing and commodities trading corporation that trades large volumes of soy, has committed to:

"No deforestation, no peat and no exploitation, and to building traceable and transparent agricultural supply chains that protect forests worldwide".[82]

REGENERATIVE AGRICULTURE

Beyond zero deforestation commitments, the sustainability of agricultural practices is a key determinant of the sustainability of the end feed product.

How we produce our food and animal feed is degrading soils at an alarming rate and is causing long term harm to the environment and our ability to feed our population. There is a critical need to rapidly accelerate regenerative agriculture: an agricultural system that puts more back into the environment and society than it takes out. By naturally reintroducing carbon and nutrient resources back into the land, this approach supports ecosystem health, mitigates climate change, and can support farmers and their livelihoods through more reliable and growing yields.

A high proportion of companies are taking action to reduce the level of fertiliser and pesticides they use and improve water management, all positive steps to reduce negative impacts on the land. But we need more companies to take the further step of actively regenerating the land while supporting livelihoods across the value chain, if we are to have enough healthy soil to feed future populations.

Danone[83] and General Mills[84] are beacons of this change, actively pursuing regenerative agriculture within their supply chains, with Danone also leading Farming for Generations, a global alliance aiming to make the global dairy industry more sustainable by helping dairy farmers transition to regenerative agriculture practices.

4.b. TRADITIONAL FORAGE CROPS AND PASTURE-FED

Forage crops are under used despite their potential to deliver a range of sustainability benefits.

Traditional forage crops such as chicory or clover can be fed directly to animals as part of a regenerative agriculture model. Many of these have limited value for human nutrition and they are incorporated as part of crop rotation practices to regenerate soil. They can also be grown on land of lower quality that is unlikely to be used to grow crops for human consumption, and could be especially relevant for ruminants currently fed grain-fed diets.

Despite their potential, we see very little explicit evidence yet of companies talking about using forage crops in their feed strategies, with only 5% of businesses referencing them. The focus in the public domain has mainly been on new innovative technologies using insects and algae or increasing use of waste and by-products in feed.

Adoption may be low due to the larger structural changes a shift towards forage crops can demand of supply chains. Practical and financial support is also needed to support farmers in the transition to new farming practices as well as government incentives if we are to see the widespread adoption of this type of solution.

EXAMPLE: INTRODUCING FORAGE CROPS TO SUPPLY CHAINS

Waitrose, a UK retailer, has taken a multifaceted approach to sustainable animal feed.[85]

For example, in their pig and poultry supply chains they have worked to increase European soy in feed concentrates, as well as locally grown faba beans. In their beef, lamb and dairy supply chains, they have supported farmers to grow home-grown forages through their Sustainable Forage Protein Project. This collaborative project involved eight farms, growing and feeding their livestock with a range of high-protein forage crops they had not previously grown on their farm. This included crops such as red and white clover, chicory, multispecies leys and lucerne. The project gave farmers the confidence and knowledge to successfully overcome the practical challenges to optimising homegrown production of forage protein. Farms saw a measured financial and carbon improvements with less need for imported protein feeds and fertiliser. This also reduced their exposure to volatile commodity feed prices.

Use of forage crops and pasture

% of businesses with public intentions to use forage crops, or grass pasture as feed or feed ingredient

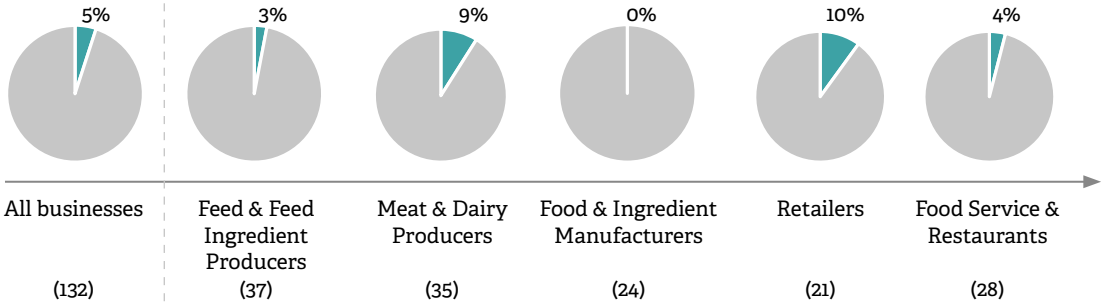


Figure 8: Proportion of businesses reviewed in this report that have made a public commitment, or were talking publicly about activities they were undertaking to use forage crops or grass pasture as feed or a feed ingredient in their business or supply chain.

4.c. EFFICIENCIES AND ADDITIVES

Improvements in feed efficiency can bring considerable benefits, such as reduced GHG emissions and nitrogen pollution, but these may be lost if production quantities continue to increase.

As animal nutrition and rearing methods become increasingly optimised, the quantity of feedstock required to meet an animal's nutritional needs can be reduced - for example, through using amino acid supplements. This helps reduce GHG emissions, nitrogen pollution, lower pressure on resources, and can be an important opportunity to reduce costs.

Over 20% of **feed and meat and dairy producers** are making commitments or undertaking activities towards optimising feed including using amino acid additives to improve their food to body mass conversion ratios, thus reducing their costs and the impact they have on land use. This focus on efficiency is seen across the globe, not just in Europe and the US, with many companies referencing investment in R&D and nutritional science to make these improvements.

EXAMPLE: IMPROVING EFFICIENCY THROUGH GENOME ANALYSIS

JA Zen-Noh, the marketing & supply arm of the JA Group, a Japanese agricultural organisation, selling members livestock & sourcing feed inputs, have outlined on their website, activities relating to:

"Further efforts underway include (iv) feeder improvements through **genome analysis** and (v) development of **compound feeds and livestock assessment methods** through new analytical methods."[86]

Driving efficiency improvements

% of businesses with public intentions to increase efficiency of feed:

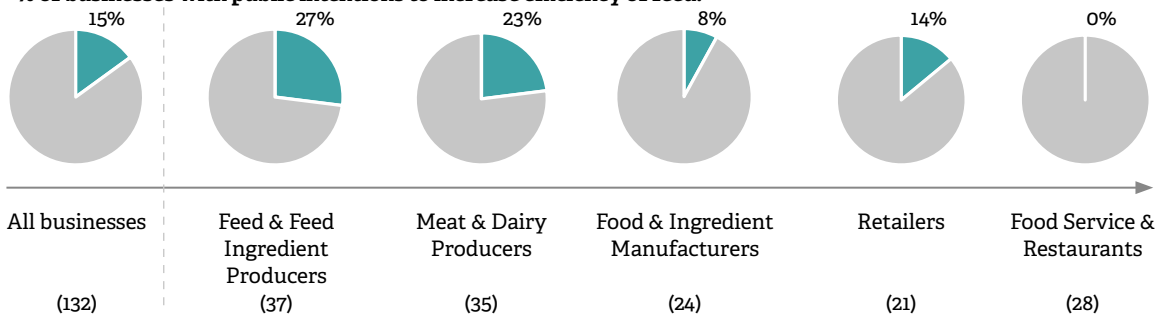


Figure 9: Proportion of businesses reviewed in this report that have made a public commitment, or were talking publicly about activities they were undertaking to improve the efficiency of feed either through use of additives or other routes.

4.d. FOOD BY-PRODUCTS

There are limited public commitments on the use of food by-products in animal feed, but more is likely to be happening unreferenced within supply chains.

By-products from food production that are unfit for human consumption as well as some forms of food waste can be used as a feed input, reducing the land used for growing feed and taking steps towards developing more circular closed loop systems. However, these strategies need to be carefully considered to make sure they don't reduce the incentives for fundamentally addressing the production of food waste. The use of food waste remains a challenging and controversial topic for regulators and business alike.

A number of businesses state that they intend to use this approach, particularly **feed and feed ingredient producers**, and it is highly likely that more is happening that is not publicly reported, particularly at a local level on smallholder farms in the supply chain that we have not been able to measure in this report. However, there is limited public promotion for this approach from the major food companies.

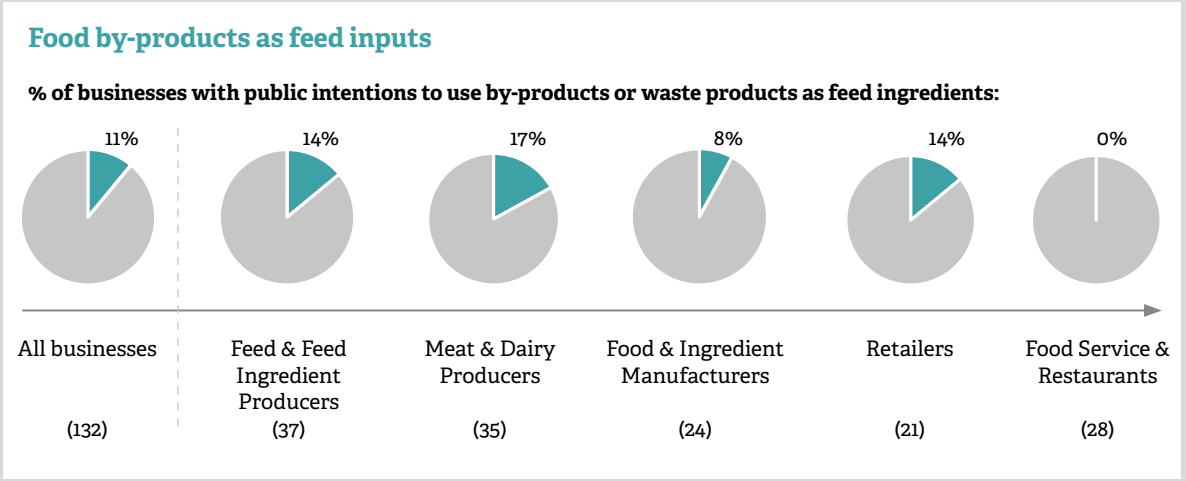


Figure 10: Proportion of businesses reviewed in this report, that have made a public commitment, or were talking publicly about activities they were undertaking to use by-products from food production or waste products as feed or a feed ingredient in their business or supply chain.

4.e. NOVEL FEEDSTOCKS

Novel feedstocks are being developed by small and large feed producers, but require greater structural changes to markets to scale successfully.

Many small, hi-tech alternative feed companies exist and are working on novel feed protein solutions. Algae and insects in particular have gained a lot of attention with investment from a broad set of venture capitalists and incumbent **feed and feed ingredient producers** hoping to scale production so as to lower the impact of feed on land use and its related emissions, as well as reduce the reliance of aquaculture on fishmeal.

One in four mainstream **feed producers** (24%) are talking about researching or starting to use alternative feed proteins. This activity is often being led by their R&D departments and through partnerships with emerging start-ups.

It is important to look holistically at the potential of novel feedstocks. These new solutions can also bring their own sustainability challenges which need to be understood as part of decision making to prevent unintended consequences. The Feed Compass Principles developed by Protein Challenge 2040 and described on page 36 can be applied to contextualise some of the claims.

Intentions towards novel feedstocks:

% of businesses with public intentions for to use novel feedstocks in animal feed (e.g. insects, algae, yeast derived protein)

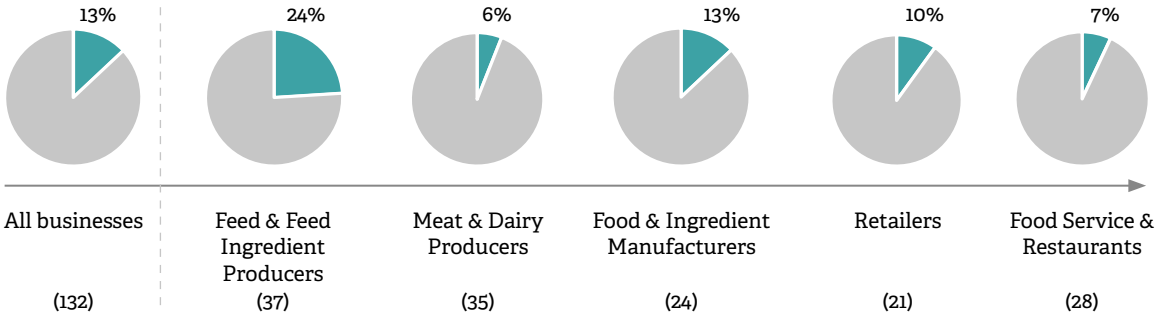


Figure 11: Proportion of businesses reviewed in this report that have made a public commitment, or were talking publicly about activities they were undertaking to use novel feedstocks such as insects, algae, yeast derived protein as a feed ingredient in their business or supply chain.

EXAMPLE: NOVEL FEEDSTOCK INNOVATION

BioMar, a global aquaculture feed solution business, have set time-bound commitments to improve the sustainability of their existing feed portfolio and pursued a novel feedstock strategy.[87]

On their website they list activities including:

Novel feedstocks:

- "They partnered with Corbion to launch salmon feed containing algae oil in 2016 – now available in UK, EU and USA.
- Investigating insect meal and the potential of Single Cell Proteins through their Research and Development centres.

Zero deforestation commitments:

- 100% certified soy and palm oil by 2020.
- 80% certified fish oil and meal by 2020."

5. TRANSFORMING THE PROTEIN SYSTEM: FOOD, FEED AND STRATEGIC INTEGRATION

THE CHALLENGE

Is the dynamism that is unfolding in the food industry moving protein onto a more sustainable path or simply taking advantage of the growth opportunities of changing consumer habits?

Are these changes co-ordinated, coherent, and commensurate with the scale of mainstream shifts that are needed?

And how much is being done to create the conditions that can enable this transformation, in terms of regulations, pre-competitive collaboration, investment incentives, changing mindsets or upskilling within businesses?

STRATEGIES

This report aimed to understand how businesses are integrating approaches to protein. How many are incorporating actions across key protein impact areas and looking beyond innovation to internally align strategies to influence structural change and mindsets? The research looked for four key components of integrated change.

a. **Co-ordinated action across a suite of impact areas** in production and consumption of protein, in particular sustainable feed and rebalancing protein in Western diets.

b. A "**sustainable nutrition**" narrative, tackling the sustainability and health agendas through the same lens to avoid unintended consequences.

c. Protein strategies which **help to deliver climate targets**, making explicit links between how they shift protein to a more sustainable footing and limit global warming.

d. Actions designed to **transform the food system**, addressing structural and cultural shifts, not just individual innovations.

In this report, as outlined earlier, we focus on the role that animal feed and rebalancing protein in Western diets can play as key impact areas in delivering more systemic changes to the protein system, but it is important that businesses look at every aspect of their interaction with protein to maximise their influence over supply chains and consumer relationships.

SIGNALS OF CHANGE

M&S launch integrated protein strategy
M&S launched its Plan A 2025 sustainability plan in 2017, which includes Scope 3 emissions targets and commitments across feed and diets, including actions to grow a comprehensive range of vegetable-based protein meal solutions, and explore alternative animal feed sources. There is also a commitment to ensure that existing soy-based feed solutions are deforestation free by 2020.[88]

Nutritional guidelines incorporate sustainability
Sweden, Brazil, Germany and Qatar incorporate sustainability into their nutritional guidelines. Scandinavia, the Netherlands, the UK and France all take the same stance through quasi-official guidelines.[89]

US $4.5 trillion new business opportunities
In 2019, the Food & Land Use Coalition launched a high profile report, "Growing Better: Ten Critical Transitions to Transform Food and Land Use"[90] at Climate Week in New York. This was the first to highlight and quantify the potential economic benefits of delivering ten critical transitions in the food system. These amounted to US $4.5 trillion in new business opportunities each year by 2030 at the same time as saving US $5.7 trillion per year by preventing damage to people and planet.

KEY FINDINGS

Few companies appear to be systemically joining the dots on integrated protein strategies to deliver better outcomes for the people and planet.

Integrated protein strategies

% of businesses with public actions or commitments

45%
have actions across both rebalancing protein in Western diets and sustainable animal feed*

15%
have developed a sustainable nutrition narrative*

15%
have actions across rebalancing protein in Western Diets and sustainable animal feed that go beyond sustainable soy*

11%
have Scope 3 emissions targets (time bound commitments to lower emissions from their supply chain and post consumption)**

Figure 12: Proportion of businesses reviewed in this report, with public actions or commitments towards each listed strategy area.
*Includes 108 businesses (exclude feed and feed ingredient manufacturers as they are largely not active in rebalancing consumer diets);
** Includes all 132 businesses

a. Co-ordinated action across impact areas

Business progress is patchy across sustainable feed and rebalancing of protein in Western diets, with the majority of businesses focusing on single issues. Given that businesses operating as part of a sustainable protein system will need to deliver against a suite of impact areas across consumption and production, the current trajectory does not add up to the scale of change required.

b. A sustainable nutrition lens

A sustainable nutrition lens is beginning to emerge, especially in the marketing of plant protein products, with 15% of companies talking about the nutrition and environmental benefits of plant-protein. Yet for most businesses the narrative hasn't yet matured to one that includes both sustainability and nutrition as explicit goals for protein.

c. Linking protein strategy to delivering climate targets

Few businesses explicitly recognise the role of protein in delivering climate commitments, and those who do tend to focus on transforming production through development of alternative feed, rather than acknowledging the role that rebalancing protein in diets could play in lowering their emissions.

d. Transforming the food system

The focus to-date has been on product innovation, not wholesale system change to transform the food system, with only a handful of businesses moving towards internally-aligned strategies, aimed at changing mindsets and influencing structural change.

There are obvious pioneers within protein, with businesses such as Danone and M&S taking a more systemic approach to their protein strategies. They have gone beyond just driving innovation to: setting clear outcome goals, collaborating with others, and aligning other parts of the business - including but not limited to marketing, procurement, and performance incentives - to deliver sustainable protein that is part of a healthy and affordable diet.

ENABLING SYSTEMIC ACTION

NGOs and other convenors have a key role to play in supporting businesses to develop integrated protein strategies. In particular, action platforms can provide a pre-competitive space for businesses to advocate for action that unlocks the structural and cultural changes necessary for a transformational shift.

NGOs can help convene businesses and **policy makers** together to develop shared, context-specific visions for protein production and consumption that drive sustainable nutrition and climate outcomes. Collaborations with **trusts and foundations** can also help businesses to chart a path forward by developing thought leadership that tackles the difficult trade-offs and questions around sustainable protein , such as the interaction between sustainable feed and improved animal welfare.

Work with **investors** is important to develop metrics for business success that include climate metrics but which are also centered more holistically on sustainable nutrition outcomes.

Finally, enabling organisations to develop systems change capabilities will increase the potential for funding, investments, policies and initiatives to address root cause issues and embed new ways of working that help to drive greater impact while reducing the likelihood of unintended consequences.

5.a. CO-ORDINATED ACTION ACROSS IMPACT AREAS

Business progress against key impact areas does not yet match the scale of change required.

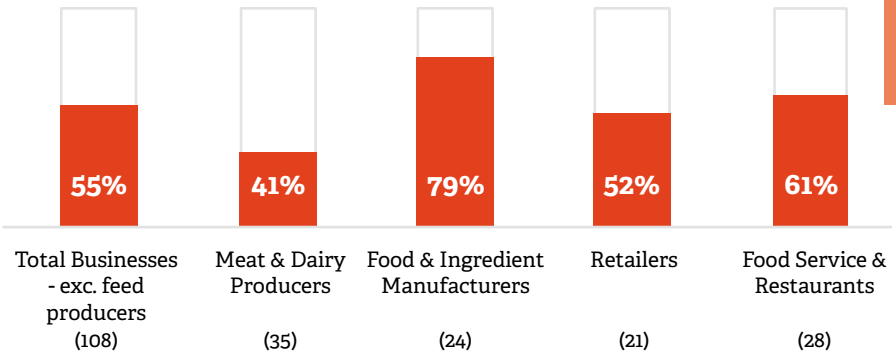
Four years on from the launch of the Protein Challenge 2040, awareness around protein as a critical issue has shifted significantly. Our research highlights a growing number of businesses acting across both sustainable feed and rebalancing protein in Western diets. But the majority of the actions remain within single issues, such as plant protein innovation or the crisis surrounding deforestation, with little attention to solutions which require a more wholesale shift in business models. Businesses operating as part of a sustainable protein system will need to deliver against a suite of impact areas across consumption and production (including areas beyond the scope of this report such as food loss and food waste) and will need to navigate a number of trade-offs.

More analysis on each of these areas is contained in the following sections:

- Focus Area 1: Rebalancing protein in Western diets [Page 22]
- Focus Area 2: Sustainable Animal Feed [Page 34]

Focus area 1: Rebalancing protein in Western diets

% of businesses actively advancing plant protein in portfolios or menus in the public domain

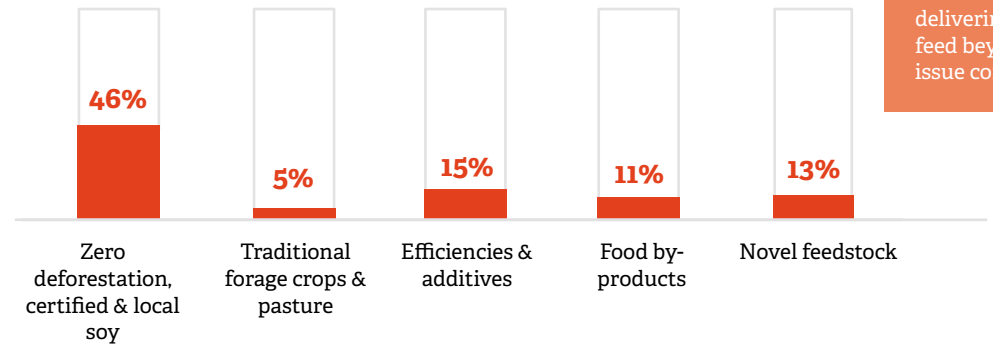


55%
of businesses are increasing availability of plant protein for human consumption

Figure 13: Proportion of businesses reviewed in this report, that are actively advancing plant protein in their portoflios or menus in the public domain. For meat & dairy producers and food & food ingredient manufacturers, includes: acquisitions, investments, new innovations, public commitments to expand range.For retailers and food service and restaurants, includes: new plant-based meals on menus, sales based targets, clear and promoted plant protein proposition on website, public commitment to expand range.

Focus area 2: Sustainable animal feed

% of businesses with public actions or commitments to each feed strategy*



33%
of businesses are delivering sustainable feed beyond single issue commitments

Figure 14: Proportion of businesses reviewed in this report, with public actions or commitments to each feed strategy. Total number of businesses included is 132; The numbers in the chart will not add up to 100%, as some businesses may occur twice if they are using a variety of strategies e.g. have a commitment towards zero deforestation soy and are also experimenting with novel feed.

5.b. A SUSTAINABLE NUTRITION NARRATIVE

A sustainable nutrition narrative is beginning to emerge for protein. But, for most businesses, we don't yet see explicit sustainability and nutrition goals.

As consumer awareness around the potential environmental and health benefits of different protein sources grows, we might expect to find a "sustainable nutrition" narrative and positioning emerging from businesses when developing and describing the benefits of their plant protein based meals or products. This is critical for preventing unintended consequences, such as increasing salt content when developing plant-based burgers. Some alternative protein businesses have embedded this narrative in their strategy, such as Quorn.

Food brands and food service contractors are starting to loosely frame their plant protein narrative around both these key areas, while retailers are more likely to highlight the health benefits of plant protein and locate the information around alternative protein products in the health sections of their website.

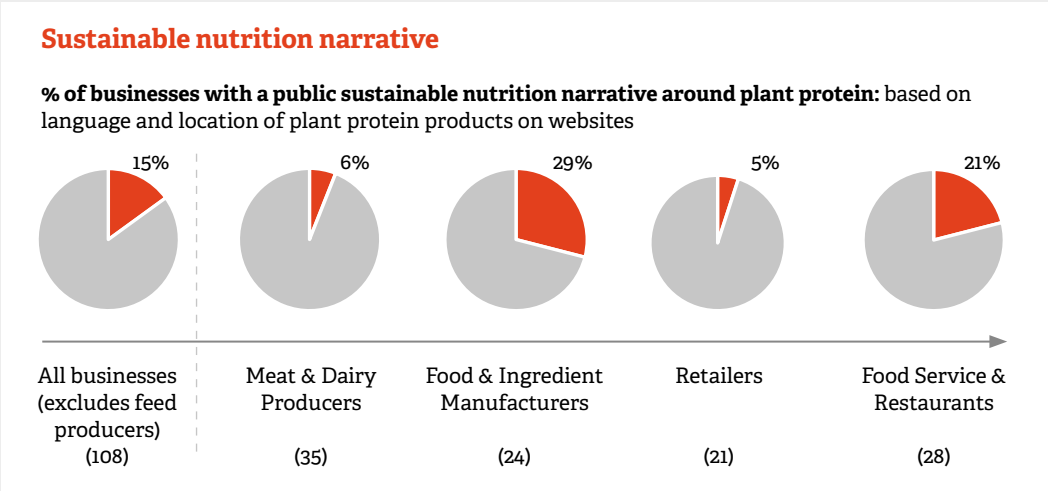
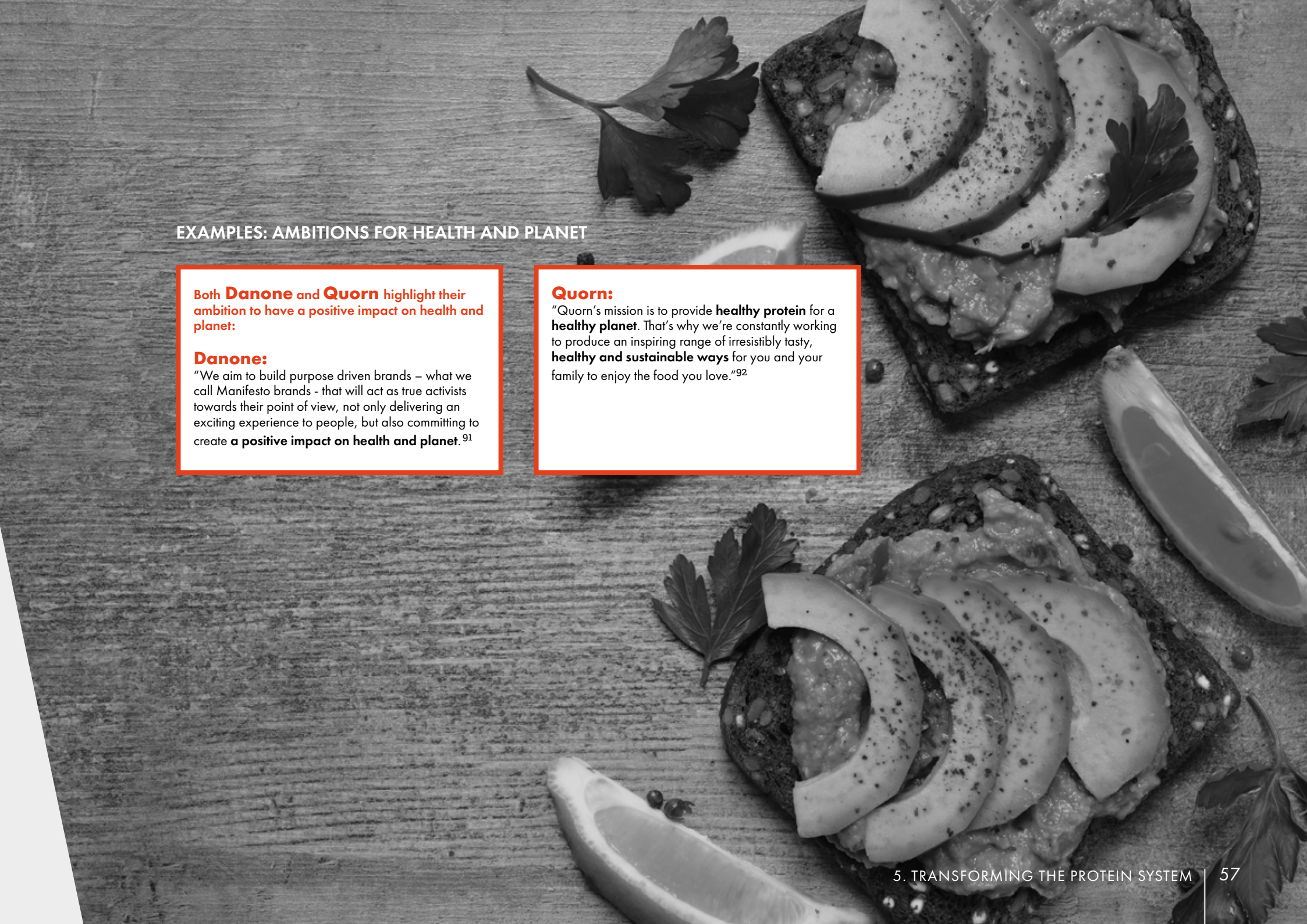


Figure 15: Proportion of businesses reviewed in this report, that are talking publicly about plant protein from a sustainability and nutrition perspective, or just a health perspective or just a sustainability perspective. Based on the language used to describe the benefits or reasons to consume plant protein and the location of plant protein products or intentions around growing plant protein on businesses websites.



EXAMPLES: AMBITIONS FOR HEALTH AND PLANET

Both **Danone** and **Quorn** highlight their ambition to have a positive impact on health and planet:

Danone:

"We aim to build purpose driven brands – what we call Manifesto brands - that will act as true activists towards their point of view, not only delivering an exciting experience to people, but also committing to create **a positive impact on health and planet**.[91]

Quorn:

"Quorn's mission is to provide **healthy protein** for a **healthy planet**. That's why we're constantly working to produce an inspiring range of irresistibly tasty, **healthy and sustainable ways** for you and your family to enjoy the food you love."[92]

5.c LINKING PROTEIN STRATEGY TO DELIVERING CLIMATE TARGETS

Few businesses explicitly recognise the role of protein in delivering climate commitments.

A small, growing number of businesses are setting Scope 3 emissions reduction targets but have not yet made the connection with the role that protein sustainability and diversification can play in achieving them. Instead, we found they are looking to renewable energy, transportation and agricultural efficiencies within their supply chains and potentially missing out on the significant gains to be made through increasing their focus on protein.

Very few businesses have committed to transformative action on protein and made the link between this and delivering climate targets, although retailers M&S and Tesco[93] are making good headway on this - delivering both alternative feed strategies and growing their plant-based meals ranges in the context of climate ambitions. Tyson was the only meat and dairy producer we found explicitly following both a sustainable feed strategy that incorporates alternative protein sources to soy, as well as diversifying to plant protein to deliver its Scope 3 emissions commitments.[95]

EXAMPLE: LINKING PROTEIN STRATEGY TO DELIVERING CLIMATE TARGETS

M&S,[94] **a UK retailer, are using their protein strategy, including production and consumption, to help deliver their Scope 3 emissions target:**

"By 2030, in line with climate science, we'll reduce our indirect greenhouse gas emissions from upstream and downstream sources by at least 13.3 million tonnes."

Energy & Food waste

"This will be activated in part through our wider goal that 50% of our products are produced in factories meeting our Gold Factory Sustainability standard (at least 35% improvement in **energy efficiency** and their own supply chain's carbon footprint mapped) as well as **commitments to prevent food waste."**

Protein in diet, farming practices

"We will also have to innovate to transform **all elements of our business model to low carbon**. So we are undertaking research into issues such as the **protein content of the diet that people eat**. We will be using our farm environmental indicators work to **set future targets for farming including on carbon**. And we will be implementing a programme to **improve soil health.**"

5.d. TRANSFORMING THE FOOD SYSTEM

Current industry focus is on product innovation, not wholesale system change.

Most of the focus to date from industry has been on product research and innovation to fill a much needed gap in alternative protein offerings, with 50-60% of food manufacturers and retailers reviewed in this report actively widening their plant based protein ranges and 24% of feed companies investigating alternative feedstocks.

Only a handful of businesses are moving towards internally-aligned strategies aimed at changing mindsets and influencing structural change. Without businesses helping to create these wider cultural and structural shifts, market opportunities for further growth may be limited. For example, scaling alternative feedstocks in the market will require significant shifts in regulation and agricultural subsidies which companies may need to consider as part of their public affairs advocacy. Equally, the growth of products using traditional plant protein or meat or dairy substitutes relies on changing how chefs are trained to ensure they have the skills needed to deliver delicious, rebelanced dishes. Training pilots and resources are emerging, such as the new curriculum the Protein Challenge 2040 is trialling with the University of West London designed to equip chefs to create rebalanced dishes and products,[96] but there is a long way to go before plant protein training becomes a mainstream practice. Shifting businesses' training priorities, as well as pre-competitive action to meet this skills gap, will be key.

Businesses are also expected to come under increasing scrutiny from the public and civil society as to whether their supply chain practices, lobbying activities, products and marketing all work to deliver sustainable protein and climate outcomes.[97] This has been underlined by reactions to meat companies launching plant based or blended meat products while not addressing the sustainability of other parts of their portfolio[98] and plant based product companies being criticised for not managing the sustainability impacts in their supply chains.[99] Implementing integrated protein strategies will therefore be critical for future-proofing businesses as the market shifts.

6. TOOLKIT FOR PROTEIN BUSINESSES AND ENABLING ORGANISATIONS

6.a. FIVE STEPS TO A FUTURE-FIT PROTEIN PLAN

Business as usual is not an option. Food businesses need urgently to future proof themselves and their supply chains.

There is huge potential on the horizon for companies to lead a transformative shift anchored around sustainability, health and nutrition and to send a strong demand signal for change via integrated public strategies and commitments. Here we present five key recommendations to drive truly transformative action:

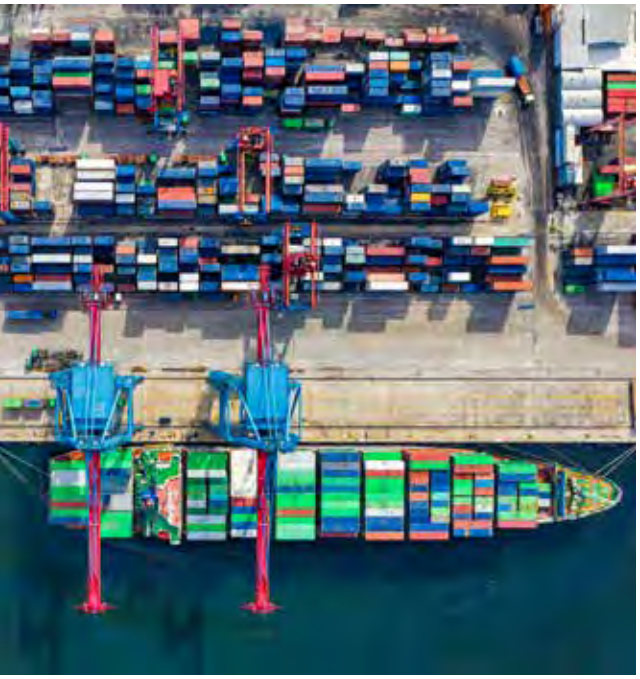
1. Develop an integrated protein strategy:
Develop an integrated protein strategy that puts sustainable nutrition at the centre of delivering healthy diets and which links to corporate climate targets and covers key protein impact areas.

2. Make public, time-bound commitments:
Make public, time-bound commitments to shift to sustainable animal feed that send clear signals to the market.

3. Embed across the business:
Focus resources on understanding the shifts needed across all consumer product portfolios to embed and enable healthy balanced diets, and how to align this across all business functions with a supportive business model, led from the top.

4. Collaborate:
Identify and act on pre-competitive challenges, from innovating our food culture, transforming across the value chain, to creating an effective enabling environment for scaling sustainable animal feed.

5. Advocate for change:
Advocate for change across the food sector, engaging policy makers and institutions. With 10 years left to address the climate challenge, businesses can play an active role in engaging policy makers, investors and NGOs to accelerate action - sending a clear signal for outcomes that deliver both sustainability and nutrition outcomes, shifting incentives in the market.



6.b GROWING YOUR PROTEIN PLAN: QUESTIONS TO ASK YOUR BUSINESS

Many in the food industry are already starting to take a leading stance. What is your role in this rapidly changing picture?

INTEGRATED PROTEIN STRATEGIES

Q. What would your business or product portfolio **look like in the future** if we have achieved sustainable, healthy and affordable protein for the growing population?

Q. What **opportunities could a joined up strategy** across key impact areas related to protein production and consumption bring to your business?

Q. How can you develop a **strategy that allows flexibility across different markets** to deliver real, context-specific impact that still adds up to the scale of the challenge?

Q. How will your protein strategy **help deliver your climate targets?** What opportunities are there to address the GHG emissions from animal feed or rebalancing protein in Western diets?

Q. What role could rebalancing protein in diets play in **delivering your health targets?** How can you articulate and deliver on a joint health and sustainability narrative to consumers and investors?

Q. How can you drive better sustainability outcomes **across the whole nitrogen cycle** in which protein is embedded? What happens if you look at nitrogen flows across your animal and/or plant protein value chains to understand where the biggest losses are occurring and where there is the largest reliance on synthetic nitrogen application?

Q. What can you do to **help deliver structural changes** required to mainstream the shift to sustainable feed and rebalanced diets? How can you influence or champion new policy initiatives or investor metrics?

Q. Which other parts of your business will be important for **delivering on protein, beyond product innovation?** What capabilities do you have that can help to create the needed shifts in skills, consumer mindsets and behaviours, supply chains, incentives, etc.?

QUESTIONS TO ASK YOUR BUSINESS (CONTINUED)

SUSTAINABLE ANIMAL FEED

Q. What would your business or product portfolio **look like in the future** if we have achieved sustainable animal production with sustainable sources of feed?

Q. How can strategies for sustainable animal protein be designed with human nutrition front-of-mind to **reduce any direct feed-food competition** and utilise the best attributes of animal protein - such as pasture-fed operations that deliver high quality protein otherwise inaccessible to humans?

Q. What **models of sustainable livestock production** exist that can deliver across multiple sustainability criteria? For example, delivering both sustainable feed and better animal welfare outcomes, while driving down antibiotic use?

Q. How can a sustainable feed and livestock approach be part of delivering a **transformation to regenerative agriculture**, for example via integrated livestock and arable farming or by increasing the market for leguminous crops?

Q. Which **other organisations** or segments within your supply chain might support innovation on feed?

Q. What role can your business play in **helping to scale novel feed solutions** so that the unit cost comes down?

Q. How can you change the **metrics and incentives** used to screen new feed options or for procurement decisions to incorporate a broader set of sustainability metrics?

Q. What role can you play in **advocating for the right policies and incentives** needed for sustainable feed?

REBALANCING PROTEIN IN WESTERN DIETS

Q. What would your business or product portfolio **look like in the future** if we have achieved sustainable, nutritious diets?

Q. What **skills and capabilities, partners, technologies supply chains or routes to market** do you need across your business to deliver rebalanced protein products?

Q. How can you work with current or future suppliers and others to **establish the supply of ingredients** needed?

Q. How might your business begin to ensure a **managed and just transition** for those people whose livelihoods are impacted by rebalancing protein in diets?

Q. The concept of 'less and better' is usually applied to meat but how can you apply the benefits of this approach to **fish and dairy** while still delivering nutritional outcomes?

Q. What can you learn from **different food cultures and mindsets** present in the different markets and consumer segments that you operate in?

Q. What **health or nutrition targets** do you have that rebalanced diets could help you to deliver?

Q. How could you help to tackle the **structural and cultural barriers to systemic change** towards rebalancing protein in diets for example through pre-competitive collaboration, government consultations, instore and wider marketing, training for chefs, development of new metrics with investors?

6.c. ENABLING ORGANISATIONS: WHAT'S NEEDED TO SUPPORT A SUSTAINABLE PROTEIN SYSTEM

Enabling organisations also play a crucial role in delivering a sustainable protein system.

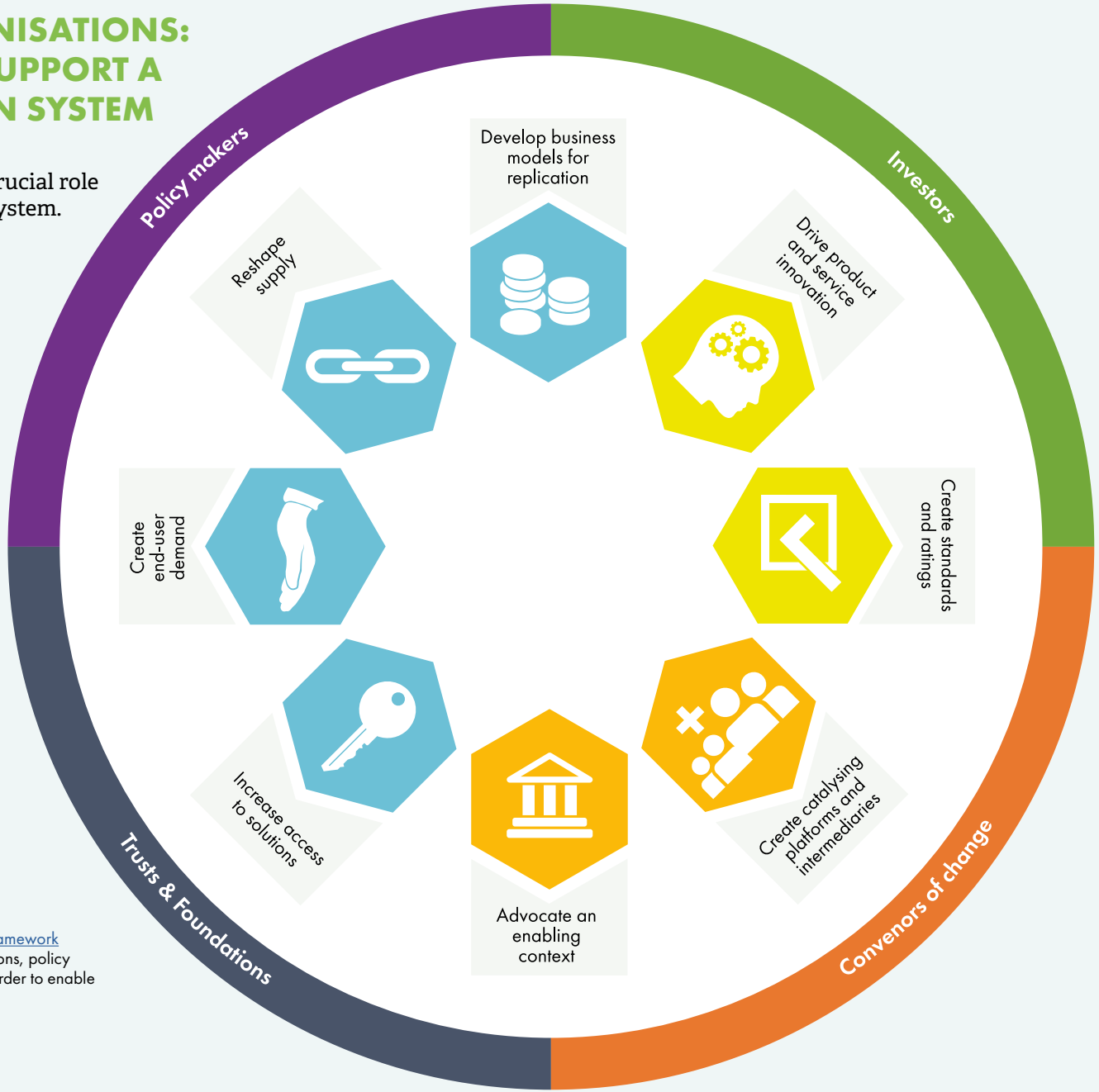


Figure 16: Forum for the Future's Scaling Up Impact Framework highlights key actions needed from trusts and foundations, policy makers, investors, and other convenors of change in order to enable systemic change on protein.

INVESTORS

1. Develop more effective metrics that encompass the whole protein system - avoid using single issue metrics in isolation - such as GHG emissions that may distort progress or cause unintended consequences for sustainability. For example, metrics recommended by Plating Up Progress include percent of sales from animal protein, setting sales-weighted targets for sustainable proteins and plant-rich food and percent of shopping basket meeting agreed nutritional standards.
2. Clearly signal to companies the need to look comprehensively at their impacts across protein through 1:1 engagements with businesses and via collaborations.
3. Provide finance into the structural changes required to scale up sustainable protein, for example around plant-based processing.

CONVENORS OF CHANGE

1. Take a systemic lens to the issue by exploring the root causes behind the barriers to a sustainable protein system and identifying the mindsets and behaviours that will be needed to support a shift.
2. Develop a shared vision for sustainable protein across different initiatives to align existing efforts, identify collaboration potential and identify gaps in collective action on protein. This will help to prevent confusion or unintended consequences in the market and ultimately deliver greater impact.
3. Collectively encourage businesses to avoid looking at single-issue metrics (for example GHG emissions) or consumption and production in isolation when designing sustainable protein strategies. This will be crucial for delivering the desired end outcome of a sustainable, nutritious and affordable protein system.
4. Provide a platform for action and advocacy to deliver the broader cultural and structural changes for a mainstream shift.

TRUSTS AND FOUNDATIONS

1. Support work that confronts the difficult trade-offs in the protein system and develops pathways for action. For example, around fish consumption, the just transition and the intersection between animal welfare and sustainable livestock production.
2. Identify enabling activities that tackle root cause issues to help to unlock business action - such as, efforts to understand and rebalance our economies in relation to the true cost of food.
3. Provide funding to stimulate innovation and implementation at scale, like trialling of new practices.

POLICY MAKERS

1. Publish priority issues and a vision for a sustainable system that is relevant to your local context, considering local needs, land characteristics, average diets and the types of protein businesses present in your market and which shifts they can have the most influence over.
2. Create a conducive enabling environment to unlock business action by tackling root cause issues - for example, efforts to rebalance our economies in relation to the true cost of food and value distribution across agricultural supply chains.
3. Facilitate funding into research for new technologies.
4. Review the incentives and disincentives in policy across areas such as subsidies, trade provisions and productivity targets to a shift towards sustainable protein and work to create alignment.
5. Explore the use of public procurement as a tool to incentivise and mainstream sustainable nutrition practices.
6. Lead on a just transition for those affected by changes in the protein system and build the conditions for emerging livelihoods. For example, understanding and supporting the shift in skills and training required.

To find out more, contact Roberta Iley on r.iley@forumforthefuture.org

7. ANNEX

7.a. SCOPE, LIMITATIONS AND BIASES

List of businesses included in the research

A number of businesses operate across more than one of the sectors in the protein value chain. In these instances we counted their commitments and actions across each sector where they are a significant player, but when calculating the proportion of businesses acting in total, we only counted each business once. For example, ADM was included as both a feed producer and a food ingredients manufacturer.

			Focus Area 1	FOCUS AREA 2	Transforming the protein system: food, feed and strategic integration			
Business	**Sectors included in**	**Main Region**	Rebalancing protein in Western diets	Sustainable animal feed	Cordinated action across impact areas	Sustainable nutrition lens	Using protein strategy to help deliver climate targets	Transforming the food system
AB Agri	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Accor Hotels Group	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
ADM (Archer Daniel Midland)	Feed & Feed Ingredient producers, Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Agravis Raiffeisen	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Agrifirm Group	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Ahold Delhaize	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Alana Group	Meat & Diary Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
Albertsons Companies	Retailer	US	Yes	Yes	Yes	Yes	Yes	Yes
Aldi Nord	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Alltech	Feed & Feed Ingredient Producers	US		Yes			Yes	Yes
Alpro	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Amul	Feed & Feed Ingredient Producers	APAC		Yes			Yes	Yes
Aramark	Food Service & Restaurants	EU / US	Yes	Yes	Yes	Yes	Yes	Yes
Arla	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Auchan	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
AVI	Food Service & Restaurants	US	Yes	Yes	Yes	Yes	Yes	Yes
Bachoco	Feed & Feed Ingredient Producers, Meat & Dairy Producers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
Barilla	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
BASF	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Baxterstorey	Food Service & Restaurants	UK	Yes	Yes	Yes	Yes	Yes	Yes
Bernard Matthews	Meat & Diary Producers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Betagro Group	Meat & Diary Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
BidFood	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Biomar	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
BRF	Feed & Feed Ingredient Producers, Meat & Dairy Producers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
BRF	Meat & Diary Producers, Feed and Feed Ingredient Producers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
BRF Food service	Food Service & Restaurants	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
Buhler	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Campbell's	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Cargill	Feed & Feed Ingredient producers, Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Cargill	Food & Ingredient Manufacturers, Feed & Feed Ingredient Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Carrefour	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
CH & Co	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Clemens Food Group	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Colombina	Food & Ingredient Manufacturers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
Compass	Food Service & Restaurants	EU / US	Yes	Yes	Yes	Yes	Yes	Yes
Conagra Brands	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes

			Focus Area 1	FOCUS AREA 2	Transforming the protein system: food, feed and strategic integration			
Business	**Sectors included in**	**Main Region**	**Rebalancing protein in Western diets**	**Sustainable animal feed**	**Cordinated action across impact areas**	**Sustainable nutrition lens**	**Using protein strategy to help deliver climate targets**	**Transforming the food system**
Coop	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Corbion	Food and Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Costco	Retailer	US	Yes	Yes	Yes	Yes	Yes	Yes
CP Group	Feed & Feed Ingredient Producers, Meat & Dairy Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
Dairy Farmers of America	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Danish Crown	Meat & Diary Producers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Danone	Food & Ingredient Manufacturers	EU / US	Yes	Yes	Yes	Yes	Yes	Yes
De Heus	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Devenish	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Dietz & Watson	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
DLG Group	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
DSM	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
East Hope Group	Feed & Feed Ingredient Producers	APAC		Yes			Yes	Yes
EDEKA	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Elior	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Evonik	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Firmenich	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Fonterra Co-operative group	Meat & Diary Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
ForFarmers	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Friesland Campina	Meat & Diary Producers	EU	Yes	Yes	Yes	Yes	Yes	Yes
General Mills	Food & Ingredient Manufacturers	US / EU	Yes	Yes	Yes	Yes	Yes	Yes
Greater Omaha	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Groupo Nutresa	Food & Ingredient Manufacturers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
Haid Group	Feed & Feed Ingredient Producers	APAC		Yes			Yes	Yes
Hersheys	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Hormel Foods	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
IKEA	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Impact Food Group	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
JA Zen-Noh	Feed & Feed Ingredient Producers	APAC		Yes			Yes	Yes
JBS	Meat & Diary Producers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
Kellogg	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Kipster Farms	Meat & Diary Producers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Kroger	Retailer	US	Yes	Yes	Yes	Yes	Yes	Yes
Labeyrie-Fine-Foods	Meat & Diary Producers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Lactalis	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Land O Lakes	Feed & Feed Ingredient Producers, Meat & Dairy Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Lidl	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
M&S	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Maple Leaf	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Marfrig Global Foods	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Mars	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Maschhoffs	Meat & Diary Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
McDonald's	Food Service & Restaurants	US	Yes	Yes	Yes	Yes	Yes	Yes
Metro Foods	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Migros	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Mondelez	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Morrisons	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes

			Focus Area 1	FOCUS AREA 2	Transforming the protein system: food, feed and strategic integration			
Business	**Sectors included in**	**Main Region**	**Rebalancing protein in Western diets**	**Sustainable animal feed**	**Cordinated action across impact areas**	**Sustainable nutrition lens**	**Using protein strategy to help deliver climate targets**	**Transforming the food system**
Nandos	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Nestle	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
New Hope Group	Feed & Feed Ingredient Producers	APAC		Yes			Yes	Yes
Nomad Foods	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Nonghyup Agribusiness Group	Feed & Feed Ingredient Producers	APAC		Yes			Yes	Yes
Novozymes	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Nutreco	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
OCS Catering	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
OSI group	Meat & Diary Producers	US / APAC	Yes	Yes	Yes	Yes	Yes	Yes
Paulig Group	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Perdue	Feed & Feed Ingredient Producers, Meat & Dairy Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Pret-A-Manger	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Quorn	Food & Ingredient Manufacturers	EU	Yes	Yes	Yes	Yes	Yes	Yes
RBI	Food Service & Restaurants	US	Yes	Yes	Yes	Yes	Yes	Yes
REWE Group	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Sainsbury's	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Seaboard Foods	Feed & Feed Ingredient Producers, Meat & Dairy Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Sigma	Meat & Diary Producers	LATAM	Yes	Yes	Yes	Yes	Yes	Yes
Sligro Food group	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Smithfield Foods	Feed & Feed Ingredient Producers, Meat & Dairy Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
Sodexo	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Stonegate	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Suguna Foods	Feed & Feed Ingredient Producers, Meat & Dairy Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
Sysco	Food Service & Restaurants	US	Yes	Yes	Yes	Yes	Yes	Yes
Target	Retailer	US	Yes	Yes	Yes	Yes	Yes	Yes
Tesco	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Thai Union	Meat & Diary Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
The Proper Food and Drink Compa	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Thompson Hospitality	Food Service & Restaurants	US	Yes	Yes	Yes	Yes	Yes	Yes
TnS Catering Management	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Transgourmet	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Tulip	Meat & Diary Producers	EU	Yes	Yes	Yes	Yes	Yes	Yes
Tyson	Feed & Feed Ingredient Producers, Meat & Dairy Producers	US	Yes	Yes	Yes	Yes	Yes	Yes
Unilever	Food & Ingredient Manufacturers	US	Yes	Yes	Yes	Yes	Yes	Yes
Unilever Food Solutions	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Veronesi	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Vicentin S.A.I.C	Feed & Feed Ingredient Producers	LATAM		Yes			Yes	Yes
Volac	Feed & Feed Ingredient Producers	EU		Yes			Yes	Yes
Waitrose	Retailer	EU	Yes	Yes	Yes	Yes	Yes	Yes
Walmart	Retailer	US	Yes	Yes	Yes	Yes	Yes	Yes
Weatherspoons	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
WH Group	Meat & Diary Producers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
Whitbread	Food Service & Restaurants	EU	Yes	Yes	Yes	Yes	Yes	Yes
Whole Foods	Retailer	US	Yes	Yes	Yes	Yes	Yes	Yes
Wilmar	Feed and Feed Ingredient Producers; Food and Ingredient Manufacturers	APAC	Yes	Yes	Yes	Yes	Yes	Yes
Yum Brands	Food Service & Restaurants	US	Yes	Yes	Yes	Yes	Yes	Yes

Interpreting the research and systemic barriers to change
We reviewed the developments underway across government policy, investment activity and initiatives that convene change within the food system; and built a picture of the key structural and cultural challenges business face when trying to shift their organisations towards a sustainable nutrition system. To uncover these factors, we used recent reports from organisations such as Changing Markets, FAIRR, WRI, "Plating Up Progress (FCRN & the Food Foundation)" and Eating Better Alliance, alongside the industry insights we have gathered from our Protein Challenge 2040 partners.

LIMITATIONS AND BIASES

Information available in public domain
We only captured activities or commitments easily accessible through company websites or press releases, with the main source of information being investor reports or sustainability reports and targets. We anticipate that some companies are more active in developing strategies for sustainable protein, but have not communicated their plans publicly, so as a result they are not presented in this report. This may be especially true within the Asia region where only limited information is presented through most business websites.

Rebalancing protein in Western diets metrics
When assessing the level of activity businesses are undertaking in rebalancing protein in diets, due to the lack of quantitative metrics in this space, we took a more qualitative approach. We adapted the criteria used to review each sector, based on the different strategies available to them:

Food and ingredient manufacturers and meat and dairy producers were reviewed based on their portfolio diversification via information about acquisitions, investments and internal product development and reformulation available in the public domain.

Retailers, food service companies and restaurants were reviewed based on the quantity and diversity of plant protein meals available (for retailers this was based on their own label ranges), the strength of the plant protein narrative on their websites and any commitments or intentions towards increasing their plant protein ranges.

These measures are limited in their subjectivity, but as no other public reporting measures exist as yet to assess public commitments towards portfolio diversification towards plant protein, they provide a flavour of the movement made towards rebalancing in these sectors.

Research timings
The research was carried out in March - June 2019, so commitments or activities undertaken since then may not have been included, despite attempts to capture any further public announcements made by businesses.

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8. PROTEIN CHALLENGE 2040

The Protein Challenge 2040 is a forward-looking, international, multi-sector collaboration across industry and NGOs working to accelerate action on sustainable protein. It is facilitated by international sustainability non-profit Forum for the Future, bringing 20 years of expertise in running multi-stakeholder collaborations to solve complex sustainability problems.

We believe there has been enough talk about the problem. We seek to catalyse action that fundamentally shifts the system we all operate in.

In 2015 this international collaboration undertook an exhaustive diagnosis process to understand the key sustainability challenges that the food system faces around protein. Through this process we identified six key points of change and developed and tested collaborative responses to unlock barriers, prioritising those where interventions were perceived to have the greatest impact potential.

From this we focused our collaborative efforts on two priorities and developed pilots for each area. Alongside exploring visions for a sustainable future for the protein system, our pilot projects addressing these two areas are designed to test what it takes to shift the whole system: in practice, this means combining several solutions, working collaboratively and looking to the long-term.

Sustainable animal feed	Rebalancing protein consumption
Addressing protein production with a particular focus on how to scale up use of sustainable animal feed for fish and livestock.	Reducing the total quantities of protein consumed in Europe and the US in line with individual country dietary guidelines; improving the sustainability of the meat, fish and dairy that's consumed; and increasing the proportion of non-animal protein in the average diet by 50%.
Pilot: Feed Compass Providing support and advocacy that influences organisations to take more ambitious action on feed. This includes the development and testing of Feed Compass principles that outline the qualities of sustainable animal feed for shaping decision making.	**Pilot: Chefs Challenge** Increasing the supply of skills into the food industry for creating and cooking great tasting rebalanced dishes with a greater proportion of plant protein, by testing how to transform mainstream chefs training.
	Pilot: School Meals Influencing next generation behaviour by testing how to get more plant-based protein meal options into the US school lunch programme, alongside testing approaches to shifting mindsets to make plant based options more acceptable, normal and desirable.

JOIN US

The window for us to solve this huge challenge is shrinking fast. Get involved today and join our dynamic collaboration - **The Protein Challenge 2040** - to benefit from being part of a network that shares collective expertise and influence.
To find out more, contact Roberta Iley on r.iley@forumforthefuture.org

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To find out more about the Protein Challenge 2040 visit: https://www.forumforthefuture.org/protein-challenge

FORUM FOR THE FUTURE

"The urgent need for the food system to transform, to enable a positive and sustainable future for people and the planet, has galvanised public interest. But we need to see companies taking a more ambitious, integrated approach to sustainable nutrition – and that means addressing sustainability across plant, meat and dairy production and consumption; and putting sustainable protein at the core of business strategies.

Businesses can lead the change needed and the five-point plan is designed to accelerate progress. The big question is what their business will look like in a world where sustainable, nutritious, affordable protein is the norm – and start shaping that future, today."

Lesley Mitchell, Associate Director for Sustainable Nutrition at Forum for the Future