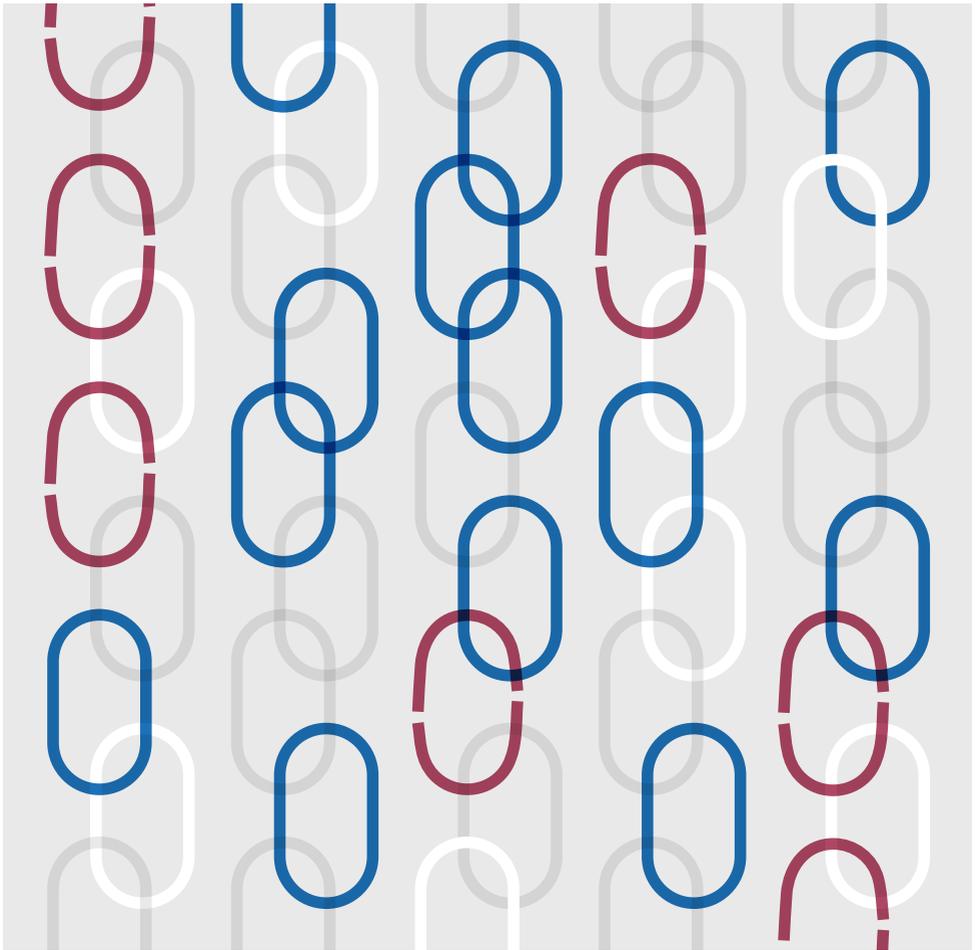


PLANT-BASED PROFITS: INVESTMENT RISKS & OPPORTUNITIES IN SUSTAINABLE FOOD SYSTEMS

FAIRR Briefing, February 2018



CONTENTS



“This report shows that alternative proteins are rapidly going mainstream. From meatpackers to supermarket stackers the global food sector is rapidly taking notice of plant-based alternatives to animal protein products, and that is driving 8% annual growth in the alternative proteins market.”

Jeremy Coller
Founder of the FAIRR Initiative and CIO of Coller Capital

Foreword	3
Introduction	4
Investment Drivers	8
Market opportunities in alternative proteins	10
Innovation in food technology	16
ESG impacts	22
Advocacy and regulation	26
How investors are responding	28
How companies are responding	38
FAIRR sustainable protein engagement	44
About the companies in the engagement	46
Engagement process	48
Findings	52
Corporate actions on protein diversification	58
References	61



DRIVERS

See page 8



INVESTORS

See page 28



COMPANIES

See page 38

FOREWORD



Duncan Pollard,
AVP, Stakeholders
Engagement in
Sustainability,
Nestlé

At Nestlé, we recognize that for a business like ours to be successful, we must take a long-term view. As a global food company, we have the responsibility and the opportunity to shape the sustainable production and consumption of food to preserve our planet for future generations – which is why we are evolving our portfolio of products based on sustainable protein sources.

Diversifying our protein sources helps us respond to growing consumer and stakeholder concerns on the impacts of increased animal protein production and consumption on both health and the environment. It also helps us capitalize on enormous opportunities in plant-based foods: in 2017, Nielsen found that over the course of 12 months, sales of plant-based alternatives to animal proteins rose 8.1%, in contrast to declining food sales in the same category.¹

Across the food industry, we are seeing the early days of a sector-wide response to the challenge of increasing exposure to alternative proteins. For food companies and their investors, no roadmap exists to help us navigate the complexity associated with protein diversification. A key first step will be to evolve a shared understanding of what corporate best practice in this area looks like across four strands: strategy, innovation, engagement and metrics.

One of Nestlé’s strategic priorities is to build out its portfolio of vegetarian and flexitarian choices. In 2017, we acquired Sweet Earth, a plant-based foods manufacturer, which gave us immediate entry into the plant-based foods segment in the US. This complements our existing European focused brand Garden of Eatin’. We are dedicating a significant part of our R&D budget to the topic of plant proteins and have already acted to reformulate existing product ranges to substitute animal-derived ingredients where possible. This has included reformulations in our health science, beverage and food businesses.

On metrics, Nestlé is currently in the early stages of defining a tracking method to monitor development of our sales in plant protein. We already track the origin of our protein sources, and we are actively looking to increase the share of plant-based proteins.

The development of the protein supply chain is an issue with the potential to radically reshape the supermarket shelf of the future. We very much welcome the support of those investors who want to act today to stay ahead of the curve in the economy of tomorrow.

We look forward to continuing to work with FAIRR’s investor network to ensure we support sustainable consumption and act as responsible stewards of the world’s natural resources for future generations.

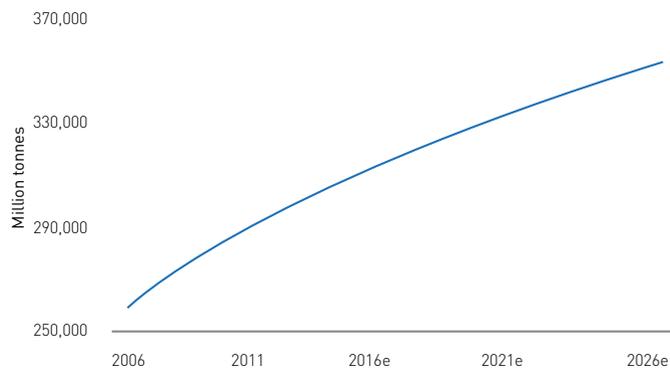
¹Source: Nielsen, 2017. ‘Plant-based proteins are gaining dollar share among North Americans.’ Accessed 24 January 2018. <http://www.nielsen.com/us/en/insights/news/2017/plant-based-proteins-are-gaining-dollar-share-among-north-americans.html>

INTRODUCTION

One of the greatest challenges facing the world today is to ensure that the growing population has access to adequate, sustainable and nutritious food.

The global food system is under increasing pressure in trying to meet this challenge. This pressure is particularly evident in livestock production, given the sector's substantial external impacts, its interaction with sustainability megatrends, and a growing global middle class that is demanding more meat.

Global meat consumption



Consumption is projected to increase +13% in the next ten years

Source: OECD-FAO Agricultural Outlook 2017-2026 Statistics

In the last 15 years, global consumption of beef, veal, poultry and pork is estimated to have risen by 30%. The latest projections by the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization of the United Nations (FAO) show demand will continue to grow, primarily due to rising incomes and population in developing countries. In developed economies like the US, demand is also expected to continue to increase, albeit at a slower

pace. Overall, global meat consumption is projected to rise by over 13% in the next ten years (OECD/FAO 2017). Meeting this demand will continue to exacerbate the industry's environmental, health and social impacts as producers scale up and intensify their operations.

2x

IN 2018, THE AVERAGE AMERICAN WILL CONSUME ALMOST 10 OUNCES OF MEAT AND POULTRY EACH DAY – TWICE THE RECOMMENDED AMOUNT IN USDA'S NUTRITIONAL GUIDELINES.



HOW WE DEFINE SUSTAINABLE PROTEINS

We define sustainable proteins as protein-rich food sources that are:

- consistent with nutritional requirements
- produced to high environmental and ethical standards
- diversified in their sourcing

The most sustainable form of proteins do not involve large-scale livestock or fish production, primarily because of the difficulties of producing animal protein sources that are carbon-neutral, high-welfare, environmentally responsible and efficient.

For this reason, our report and investor engagement has a specific focus on alternative proteins, which include plant-based foods and protein sources, fermented proteins and cultured meat. We believe these sources provide among the most promising solutions for feeding the world sustainably and nutritiously.

RISKS AND OPPORTUNITIES IN PROTEIN PRODUCTION

Conventional (i.e. industrial) livestock production systems have enjoyed uninterrupted growth over the last few decades. While this trend is expected to continue in the short term, resource constraints may dampen expansion in the long term. Furthermore, the sector is increasingly ripe for disruption. The issue of protein diversification is therefore key to managing the risks of climate-affected supply chains and for seizing opportunities for market growth.

Livestock production presents reputation and market risks for companies that are over-reliant on animal proteins to drive revenue growth. The sector is heavily dependent on unpriced externalities associated with the inputs to, and resultant outputs from, this type of system, which have enabled its dramatic expansion. These include deforestation, unregulated antibiotic use, poor animal welfare practices, and low scrutiny of air and water pollution on surrounding communities. These externalities and impacts are incompatible with the Sustainable Development Goals (SDGs). Thus it is increasingly likely that governments could use some form of taxation to combat meat's negative contributions to climate change and health epidemics such as obesity and cancer.

Alongside the growing risk profile of livestock production, there are also opportunities to be seized from the burgeoning plant-based foods market and, more broadly, alternative proteins, which offer a more sustainable food production model. The growing trend of millennials adopting flexitarian and meat-free diets signals a change in purchasing habits that is a significant shift from that of earlier generations. Companies across the food value chain, from producers to retailers, are already investing in these opportunities. In the short to medium term, advances in technology and innovation will open entirely new areas of investment opportunity that will likely transform the protein sector in a fundamental way.



Protein diversification has the potential to transform a food company's core business and value proposition: its growth, profitability, risk exposure and ability to compete and innovate.

For these reasons, investor interest in this issue is expanding. We see four key drivers that will shift the food system from its dependence on animal proteins towards alternative protein sources:

- growing market opportunity to meet demand for plant-based foods;
- accelerated innovation in food technology;
- increasing awareness of ESG impacts linked to intensive livestock production;
- and advocacy and regulation to moderate growth in the animal protein sector.

Main drivers of protein diversification



This shift is highlighted by the growing investor support for FAIRR's engagement with 16 global food companies to diversify protein sources. We launched our engagement in September 2016, supported by 40 investors with \$1.25 trillion in combined assets under management (AUM). At the time of writing, AUM support has almost doubled with 57 investors now managing some \$2.4 trillion (learn more about our engagement from page 44 onwards).

MARKET OPPORTUNITIES IN ALTERNATIVE PROTEINS

"Robeco has been engaging on opportunities in sustainable protein development since 2016. We regard the shift from pure play animal protein suppliers to protein-of-choice suppliers based on both animal and vegetable protein as crucial for the meat processing companies and food producers we engage with. Collaborating with FAIRR and other investors has strongly supported our work in this space."

Peter van der Werf
Senior Engagement
Specialist at Robeco

In recent years, the plant-based foods market has seen strong growth. Alternative proteins and flexitarian diets were named key food trends in 2017 and 2018 by numerous industry commentators including Rabobank, Forbes, Mintel, Innova Market Insights and MarketWatch.

“The strong and persistent drivers supporting the current growth of alternative proteins will continue over the next five years, at least... Alternative proteins have the potential to capture a material share of animal protein demand growth in the EU, and capture more market share in the US and Canada.”

Justin Sherrard

Global Strategist –Animal Protein at Rabobank.

Annual global sales of plant-based meat alternatives have grown on average 8% a year since 2010. Currently, growth is about twice the rate of processed meat, with annual sales of about \$2 billion (Bloomberg Intelligence 2017). Industry estimates project that the sector globally will expand at a compound annual growth rate (CAGR) of 8.29% between 2017 and 2021 (Research and Markets 2017), with the plant-based meat market reaching \$5.2 billion by 2020 (MarketsandMarkets n.d.). Longer term, it could make up a third of the market by 2050 (Lux Research 2015).

US

US retail sales of plant-based foods that directly replace animal products grew 8.1% in the 12 months to August 2017 (Good Food Institute, Plant Based Foods Association and Nielsen 2017). This compared with a fall in sales of 0.2% for all foods sold across American grocery stores. Plant-based cheese alternatives were the fastest-growing category, enjoying 18% growth.

EUROPE

Europe is the largest market for meat substitutes, accounting for 39% of global sales (Allied Market Research 2016). With 8% annual growth rates in the EU and flat consumption for traditional meat products, Rabobank’s 2017 report suggested that alternative proteins could represent a third of total EU protein demand growth in the next five years (Rabobank 2017).

- In Germany, one in ten consumers buy meat alternatives, rising to one in five for Germans aged between 16 and 24. A decade ago, only 1% of Germans considered themselves vegetarians; this has risen to 7% (Mintel 2015).
- Around half of Italian consumers say they are lowering their red meat intake, while 24% say they are increasing the amount of vegetarian processed foods in their diet (Mintel 2017).

ASIA

Between 2012 and 2016, new vegetarian and vegan product launches increased by 140% and 440% respectively in Southeast Asia alone. The Asia–Pacific region is poised to register the highest CAGR of 6.3% between 2017 and 2025 (Persistence Market Research 2017). A useful illustration is the acquisition of plant-based protein producer Quorn Foods by Philippine food giant Monde Nissin. Following the deal, Monde Nissin pointed to the fact that the meat alternatives market is currently concentrated in Europe and North America. Asia, currently lagging behind with a market share of just 12% to 15%, offers significant growth opportunities for investors.



ALTERNATIVE PROTEIN DEMAND IS DRIVEN BY HEALTH CONCERNS AND MILLENNIALS

The expanding reach of social media, the availability of information on food provenance, and concerns around transparency in the food industry globally means that issues around health, sustainability, traceability and animal welfare have more impact on consumer purchasing decisions. The meat-free market sits at a lucrative intersection of all of these changing social dynamics.

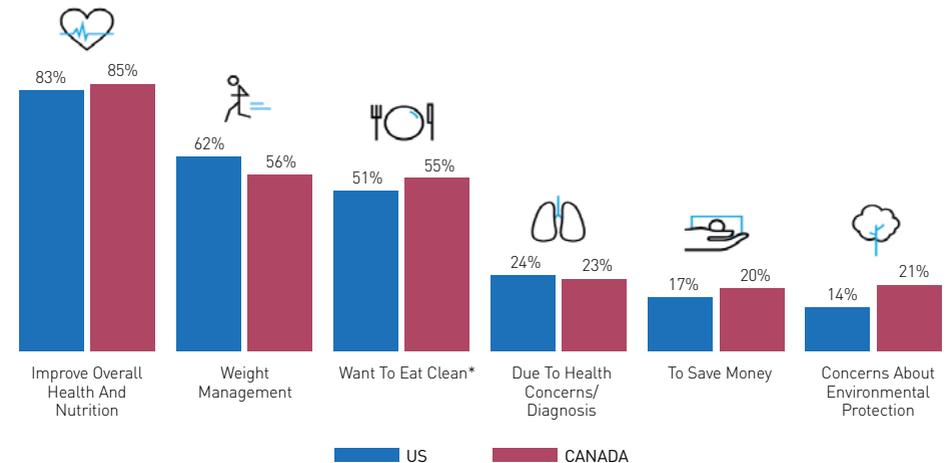
Consumers are increasingly reducing meat intake to improve their health. This is largely driven by a growing awareness of a causal link between high meat consumption and some non-communicable diseases (NCDs), supported by a mounting body of scientific evidence. This in turn is prompting health campaigners, professionals and regulators to deliver a consistent message around the benefits of eating less meat. We expect this trend to continue (see Advocacy and regulation section on page 26).

To illustrate, a 2017 study published in the British Medical Journal linked high levels of red meat consumption to a 26% increase risk of contracting nine NCDs, including cancer, type 2 diabetes, strokes and Alzheimer’s (Etemadi et al. 2017). The World Health Organization, in a high-profile announcement, has also classified red and processed meat as carcinogenic.

In contrast, consumers see health benefits in plant-based proteins, and associate these products with positive health effects and superior nutritional value. A 2016 University of Oxford study found that a ‘healthy’ diet (i.e. one containing less meat) could prevent 5.1 million deaths a year globally by 2050. Meat-free protein products are no longer limited to the relatively narrow consumer group that identifies as vegetarian or vegan. For example, 39% of Americans are actively trying to incorporate more plant-based foods into their diets, and millennials are driving this shift: 30% eat meat alternatives every day, while 50% eat meat alternatives a few times a week (Nielsen 2017).



Why people are eating more plant-based foods



*Incorporate more foods that are unprocessed or minimally processed Source: Nielsen, Homespun Panel Protein survey, April 2017 (U.S.) Source: Nielsen Panelviews survey, March 2017 (Canada)

PLANT-BASED PRODUCTS OVERTAKE MILK

Plant-based products, such as soy and almond milk, now make up 10% of the overall dairy market, while animal-based dairy products have stagnated.

Worldwide sales of plant-based dairy alternatives more than doubled between 2009 and 2015 to \$21 billion, according to Euromonitor. Nearly 50% of Americans are reported to consume non-dairy milk, with this trend attributed to concerns over heart health and weight loss.

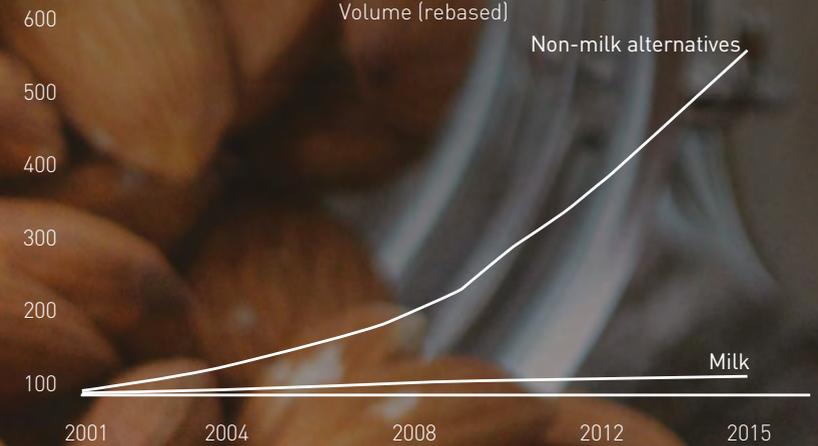
Increasing product variety is also driving growth. Companies are starting to experiment with ingredients such as barley, flax, hemp and pea milk, all of which offer health benefits such as high omega-3 and protein content. In Western Europe, sales of almond, coconut, rice and oat milks doubled in the five years to 2014. In Australasia they rose threefold and in North America ninefold, according to Euromonitor.

Meanwhile, per capita consumption of milk has dropped 13% in the US over the past five years, while in Europe sales have fallen 4.1%.

Against this backdrop, US dairy producer Dean Foods reported lower profits for the third fiscal quarter of 2017. In mid-2017, the company bought a stake in Good Karma foods, a leading US producer of plant-based dairy. Dean's CEO Ralph Scozzafava said that as part of the company's "focus on diversification both within and beyond dairy... this opportunity with Good Karma is a way for us to build a platform for a larger plant-based portfolio." Other high-profile companies such as Danone are also actively addressing the shift (see case study, page 41).

Milk and non-dairy milk consumption

Volume (rebased)



Source: Euromonitor, Financial Times

INNOVATION IN FOOD TECHNOLOGY

Advances in plant-based and alternative protein products are capturing a great deal of interest from consumers and mainstream news as well as filling space in retailer aisles and on foodservice menus.

We are already seeing innovative new products and companies appearing across categories. However, we may be on the cusp of a food technology revolution that could accelerate this trend exponentially.

Since the 'Green Revolution' of the 1930s to 1960s, innovations such as synthetic fertilisers, herbicides, selective breeding and antibiotics have enabled a substantial increase in food production, to keep pace with population growth.

These advances in productivity are limited, however. Animal agriculture is inherently inefficient, particularly in terms of feed conversion. According to the World Resources Institute (WRI), even the most efficient source of meat – chicken – converts only around 11% of gross feed energy into animal protein (WRI 2016). There is growing realisation that this inefficiency has created a system that is ripe for shaking up.

Today's food technology revolution will fundamentally disrupt the current market, ending the historical incremental growth in food production efficiencies. Novel ingredients and biotechnology – from advanced plant-based proteins to cultured (or 'clean') meat products – will produce protein-rich foods without the animal. This, in turn, will create a step change in efficiency for a fraction of the cost and with far fewer adverse impacts.

12 November 2017

The Financial Times

Silicon Valley sets sights on disrupting the meat industry

10 August 2017

Global Meat News

Lab-grown meat firm in talks to license tech

1 November 2017

Forbes

Fake Meat, Non-Dairy Draw Hungry Investors

2 August 2017

Wired

Meatless meat: the startups ditching animals from meat

7 December 2017

Reuters

Tyson Foods raises stake in plant-based protein maker Beyond Meat

19 December 2017

Fortune

Silicon Valley and the Search for Meatless Meat

23 August 2017

Bloomberg

Bill Gates and Richard Branson Back Startup That Grows 'Clean Meat'

7 March 2017

Fox Business

Tyson Foods CEO: The Future of Food Might Be Meatless

30 November 2017

The Economist

Plant-based 'meat' is so tasty that Europe's meat industry has to bite back

15 October 2017

The Wall Street Journal

The Race to Find Meatless Protein Products

A RECIPE FOR VENTURE CAPITAL

Plant-based meat companies have announced significant investment rounds from venture capital investors in the past year. Impossible Foods is the most highly funded, with \$258 million in disclosed financing since its founding in 2013, most recently \$75 million in August 2017. Beyond Meat follows with almost \$50 million in disclosed funding to date. Earlier stage companies focused on fermentation and cell culture technologies also raised meaningful amounts over the past year, with Memphis Meats announcing their \$17 million Series A in August 2017. Across the spectrum of alternative protein technologies, the mainstream investment interest in these companies is notable: from Tyson Foods and Cargill to Singaporean sovereign wealth fund Temasek and UBS.

ALTERNATIVE PROTEIN TECHNOLOGIES

Advanced plant-based

Derived from plant sources and optimised for taste, texture and nutrition through use of either novel plant sources (e.g. mung bean, lupin, algae) or through novel processing methods (e.g. shear-cell technology)

Fermentation

Creation of animal proteins such as casein and whey through a brewing process whereby yeast organisms are programmed to produce the proteins

Cell culture

Growing meat cells (muscle and fat) in a nutrient-rich culture medium to create whole pieces of tissue



GROWING FAST, SHRINKING COSTS

Many companies across the alternative protein spectrum are early stage and yet to commercialise, or are still at low-level production. Yet the speed of their technological development, scale up and cost reduction indicates that mass production and mainstream adoption may be on the horizon in the short to medium term.

Cultured meat company Memphis Meats, for example, has dramatically reduced the cost of its product over 12 months. While its original meat cost \$18,000 per pound, by May 2017 the company announced it had

reduced costs to \$3,800 per pound. The company has said that its protein products use just 1% of the land and 1% of the water compared to traditionally produced meat products. Similar claims are echoed by other companies in the space who have conducted initial life-cycle assessments on their product.

The potential for rapid scale up and cost reduction, alongside the clear benefits from an impacts perspective, makes an attractive case for investment.

Company	Technology	Commercial	Production and costing	Investments
Beyond Meat 	Advanced plant-based protein using soy and pea protein with extrusion processing	<ul style="list-style-type: none"> Retail: in 20,000 US stores, including Kroger, Safeway, Walmart, Target Restaurants: TGI Fridays and Veggie Grill Food service: carried by Sysco 	<ul style="list-style-type: none"> Retails at \$5.99 for 2 1/4lb burger pack Most recent funding round (December 2017) will enable a tripling of current production capacity 	<ul style="list-style-type: none"> Almost \$50 million disclosed funding to date Tyson Foods took 5% stake through the Series F round in 2016, and announced a further investment in the Series G announced in December 2017. Other notable investors include 301 Inc and Google Ventures
Impossible Foods 	Advanced plant-based protein using wheat and potato protein, plus heme created through a fermentation process	<ul style="list-style-type: none"> Restaurants: as of beginning 2018, available in over 500 restaurants in the US, including Bareburger and Umami Burger chains 	<ul style="list-style-type: none"> Sells at \$13.95 (same price as a beef burger) Key inputs cost reduced by 40% during 2017 Opened new facility in 2017 Q3 with capacity to produce at least 1m lb of minced meat per month (4 million burgers) 	<ul style="list-style-type: none"> \$258 million disclosed funding to date Latest raise was a \$75 million note announced in August 2017, with Temasek leading Other notable investors include UBS and Horizons Ventures
Memphis Meats 	Cell culture technology producing beef, pork, chicken and duck	<ul style="list-style-type: none"> Currently focused on scale up; targeting 2021 for product in the market 	<ul style="list-style-type: none"> Production costs decreased by 86% during 2017; aim to launch commercial product by 2021 	<ul style="list-style-type: none"> \$17 million Series A announced in August 2017, lead by VC fund DFJ and backed by Cargill and other notable investors such as Richard Branson In January 2018 it was announced that Tyson Foods has also invested

ESG IMPACTS LINKED TO LIVESTOCK PRODUCTION

Intensive livestock farming is the central driver of multiple challenges that have a negative impact on the global environment and people’s health, from climate change and deforestation to water use and pollution. These challenges occur both at the point of livestock production and upstream in the feed supply.

DIVERSIFYING AWAY FROM LIVESTOCK IS ESSENTIAL FOR PORTFOLIO DECARBONISATION

It is becoming increasingly clear that tackling livestock emissions in food production should be an essential part of any investor strategy towards portfolio decarbonisation. Two peer-reviewed studies published in 2014 calculated that unless the trend of increased livestock production and consumption is substantially cut, agricultural emissions will take up the entire world’s carbon budget by 2050, with livestock as the primary contributor (Hedenus, Wirsenius & Johansson 2014). This would mean that every other sector, including energy, industry and transport, would have to be carbon neutral, which is described as “impossible”. Chatham House’s report on the subject concluded: “Dietary change is essential if global warming is not to exceed 2°C.”

More recent research from the Intergovernmental Panel on Climate Change has reinforced that methane emissions from livestock are a priority issue. Revised calculations published in 2017 show that emissions from cattle are 11% higher than previously estimated (Wolf, Asrar & West 2017).

Supply chain efficiencies alone will not be sufficient to tackle the problem; shifting diets towards more plant-based foods is equally necessary. If consumers in the US, for example, made one simple dietary change – substituting beef with plant-based protein from beans – the country could achieve between 46% and 74% of its greenhouse gas (GHG) emissions targets for 2020 (Harwatt et al 2017). This makes animal agriculture the low-hanging fruit of the Paris Climate Accord targets, and an important facet of any effective climate change mitigation strategy.

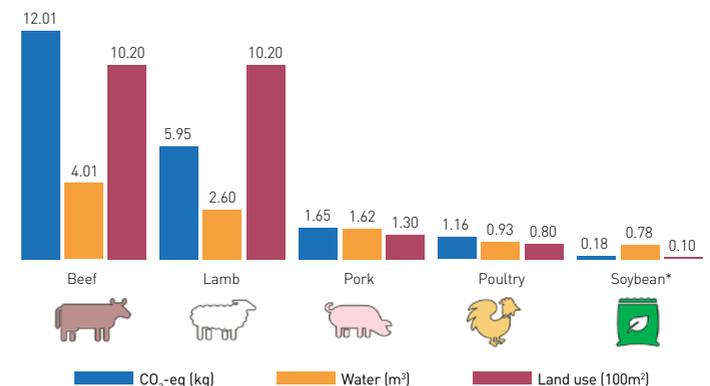
POLLUTION FROM INTENSIVE LIVESTOCK FARMING IS EXTENSIVE, UNDER-REPORTED AND GROWING

Livestock production is a resource-intensive activity with a large environmental footprint. It can cause land, water and air pollution for surrounding communities and ecosystems.

New Zealand, one of the largest global producers of beef, dairy and lamb, has seen an alarming increase in nitrate and microbe levels in its water sources from livestock effluents (The Economist 2017). Last year, the US National Oceanic and Atmospheric Administration announced the largest ‘dead zone’ ever recorded in the Gulf of Mexico, caused by extensive soy and corn cultivation in the area to feed livestock farms. Official data shows that about 94% of ammonia emissions in Europe come from agriculture, mainly from activities such as manure storage or slurry spreading.

Communities next to livestock farms frequently report higher rates of nausea, increases in blood pressure, and respiratory issues such as wheezing and increased asthma symptoms among children (The Guardian 2017a). These issues have led to community protests opposing the construction of new industrial farms and processing facilities by companies such as Tyson and Costco.

The environmental impact of animal protein per kg of protein



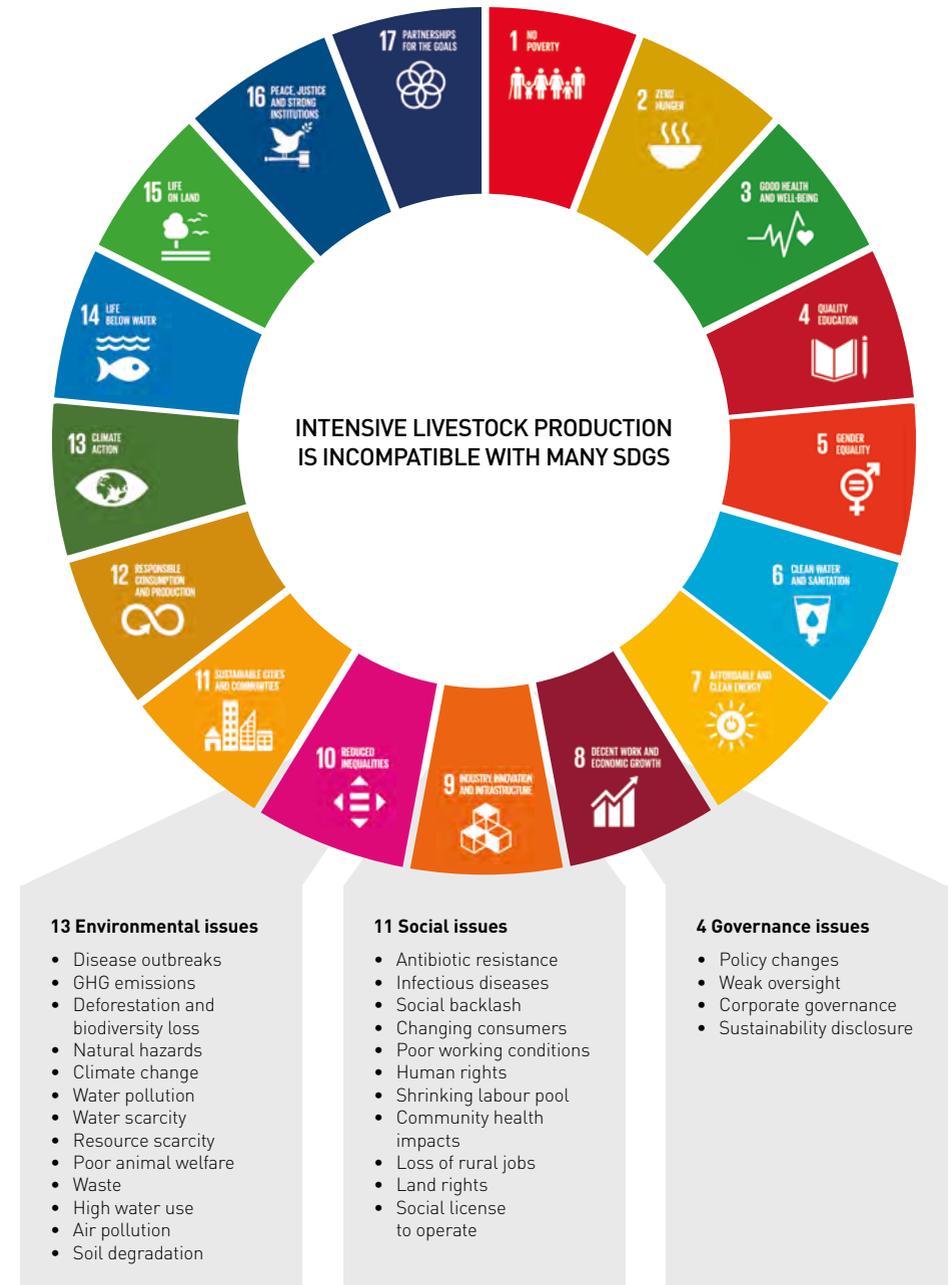
*Soybean produced under sustainable conditions
Sources: OECD-FAO Agricultural Outlook 2017–2026; FAO, Tackling climate change through livestock 2013; Mekonnen & Hoekstra (2011 & 2012); Clark & Tilman (2017); USDA (2017)

ANTIMICROBIAL USE IN FOOD ANIMALS REPRESENTS A SYSTEMIC RISK

The food industry continues to be the largest consumer of antibiotics globally – and is a leading contributor to rising antimicrobial resistance. Most of this is through non-therapeutic use in intensive-farming systems, to promote growth or to prevent disease and infection in healthy animals. Worldwide, more than 131,000 tonnes of medically important antibiotics were used in farm animals in 2013. By 2030 it is estimated that India, China and the US will each increase their antibiotics usage by 82%, 59% and 22% respectively (Van Boeckel, T. P. et al., 2017).

While scrutiny of such rampant drug use has increased, regulations alone will not be sufficient to combat antibiotic use in the livestock sector. A recent study found that limiting meat intake worldwide to 40 grams a day per person – the equivalent of one standard fast-food burger – could reduce global consumption of antimicrobials in food animals by 66% (Van Boeckel, T. P. et al., 2017). By comparison, the average American is expected to consume 222 pounds of meat in 2018 – or about 2.4 burgers per day (Quartz 2018).

FAIRR has found 28 environmental, social and governance issues linked to livestock production, as illustrated opposite.



ADVOCACY AND REGULATION

Due to their inherent production efficiencies, concentrated livestock farming operations have increased global access to cheap animal protein. This, in turn, has fueled meat consumption worldwide. Investors have rushed to capitalise on what has proved to be a profitable sector. But this growth has occurred in an era of low regulatory and public scrutiny. In the US, for example, air emissions from industrial livestock farms are not regulated under the US Environmental Protection Agency's Clean Air Act.

This era of relatively lax regulation may be coming to an end, given the growing awareness of the impacts of livestock production on both the environment and human health.

Government actions to tackle health and sustainability impacts

Meat's growing health burden has prompted governments around the world to issue dietary guidelines to reduce meat consumption. Countries in Europe, such as France, the United Kingdom, the Netherlands and Sweden, have established new dietary guidelines that recommend people reduce their meat and dairy intake. The first ever overhaul of Canada's Food Guide is emphasising plant-based foods over animal proteins. In 2016, China's health ministry revised the lower end of its recommended meat consumption range to encourage citizens to moderate their meat intake.

Governments are also starting to consider the impact of diets on the climate and environment. During the most recent revision of the US dietary guidelines in 2015, the review team's expert panel recommended the inclusion of key material environmental indicators. Denmark is considering proposals to introduce a tax on red meat. In 2016, the Green Party in Sweden tabled a motion in the Swedish parliament calling for the introduction of a climate tax on food.

"Intensive livestock farming has seen rapid expansion in the last few decades. In the US alone, 50,000 facilities are classified as concentrated animal feeding operations. Worldwide, intensive farms account for 72% of poultry, 42% of egg and 55% of pork production."

The Guardian 2017b



Consumer demand for clean labels and transparency

There is growing demand among consumers to better understand the provenance of their food and to avoid products deemed unnatural or unhealthy. These 'clean' eating trends, driven primarily by millennials, favour foods that are healthy, ethically sourced and less processed. Increased plant-based food consumption is a direct consequence of this shift. Food companies are therefore looking to attract a new generation of consumers, by seeking growth through food sources not dependent on intensively raised livestock.

Animal welfare as a licence to operate

Animal welfare, driven by NGO campaigns and consumer demand, has fast become a core focus for food companies in recent years. Illustrative of this shift is cage-free egg production. In 2015, McDonald's announced a policy to move its entire North American egg supply to be cage-free (over 2 billion eggs a year). Since then, over 200 US-based companies have made similar commitments. All major retailers in the UK are now either cage-free on their whole eggs, or have committed to be so by 2025, with similar momentum in many European countries. In these regions, and increasingly further afield, robust corporate policies to reduce stocking densities and allow animals to express their natural behaviours have become a 'licence to operate' issue – and must be priced into any production system. Laggard companies that prioritise production efficiency without consideration to welfare are exposed to reputational and operational risks.

INVESTORS ARE SEEKING TO CAPITALISE ON PLANT-BASED PROFITS

“Sustainable protein is a fast-emerging issue for the food industry, and it is important for long-term investors to know if the companies they invest in understand the related risks and opportunities. FAIRR’s sustainable protein engagement offers practical guidance to companies to ensure they have a business strategy that is robust enough to respond to a changing food supply chain. For us as investors, this engagement also helps us to be on top of the developments in this space as well as to identify food companies that proactively invest in innovative solutions.”

Sasja Beslik

Head of Group Sustainable Finance, Nordea

Protein diversification is increasingly recognised by institutional investors as a relevant ESG theme. Not only is it intrinsically linked to multiple social and environmental issues, but it also helps investors improve their portfolio performance against the Sustainable Development Goals (SDGs).

Most importantly, protein diversification is a way of increasing company competitiveness and, ultimately, financial and operational resilience. In many cases, investors are assessing both the risks associated with the intensive production and consumption of animal proteins, and the opportunities associated with the shift towards alternative sources of protein.

“Sustainable and plant-based proteins are true win-wins for companies and investors. They are often higher growth produce, aligning with emerging consumer demands. Sustainable proteins also have better risk profiles, with much lower demands on resources such as water, land and feeds. They also have significantly reduced environmental externalities and pollution and in most cases, represent healthier food options for consumers.

Impax is delighted to join FAIRR in engaging with global food companies to encourage increased exposures to these opportunities and to help companies become better positioned for the transition to a more sustainable economy.”

Lisa Beauvilain

Head of Sustainability & ESG, Director, Impax Asset Management

QUANTIFYING THE ESG IMPACTS ASSOCIATED WITH INTENSIVE LIVESTOCK PRODUCTION

Investors are developing a wide range of methods and tools to assess individual company exposure to healthy and nutritious food and the environmental impact of food portfolios to identify sources of investment risk and opportunity. Some are using a range of climate, water and land indicators to calculate the environmental footprint of food companies to inform their investment decisions. Others are using negative screening criteria to exclude, for example, companies with high exposure to animal protein.

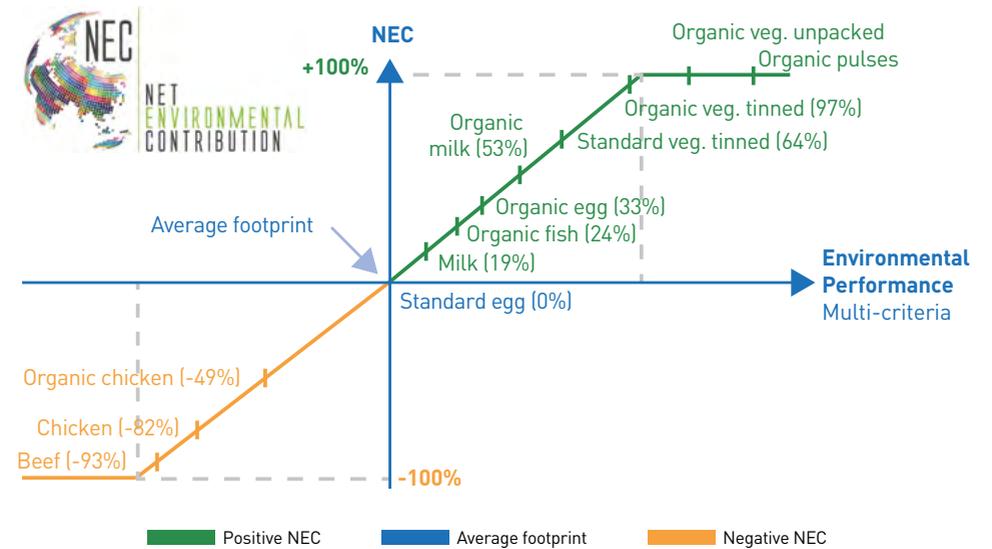
BNP PARIBAS AND SYCOMORE AM – HELPING INVESTORS UNDERSTAND ESG RISKS AND OPPORTUNITIES

In June 2017, BNP Paribas Securities Services partnered with Sycomore Asset Management to accelerate the deployment of the NEC, a new metric for assessing the environmental impact of the economic activities of a company, a portfolio or an index. Developed since 2015 by Sycomore AM, a specialist in responsible investment, and in association with I Care & Consult and Quantis’s experts, the NEC indicator assesses the contribution of a company’s overall activities towards energy and ecological transition, and measures the degree to which a business model is aligned with climate change goals.

The NEC uses a scale ranging from -100%, for activities which are the most harmful to natural capital, to +100%, for the most environmentally-friendly solutions. In the case of the food industry, the NEC indicator classifies different types of food according to their respective environmental impact (climate, water, biodiversity) and the associated nutritional content (proteins, lipids, carbohydrates).

“The NEC marks a new stage in quantifying the environmental impact of companies and the ongoing search for sustainable performance levers. It is proving to be a useful compass to measure our environmental impact and to separate, within our portfolios, the winners and pioneers from the green-washers and the endangered economic species turning into stranded assets. We are convinced this indicator will also be of great use to investors.”

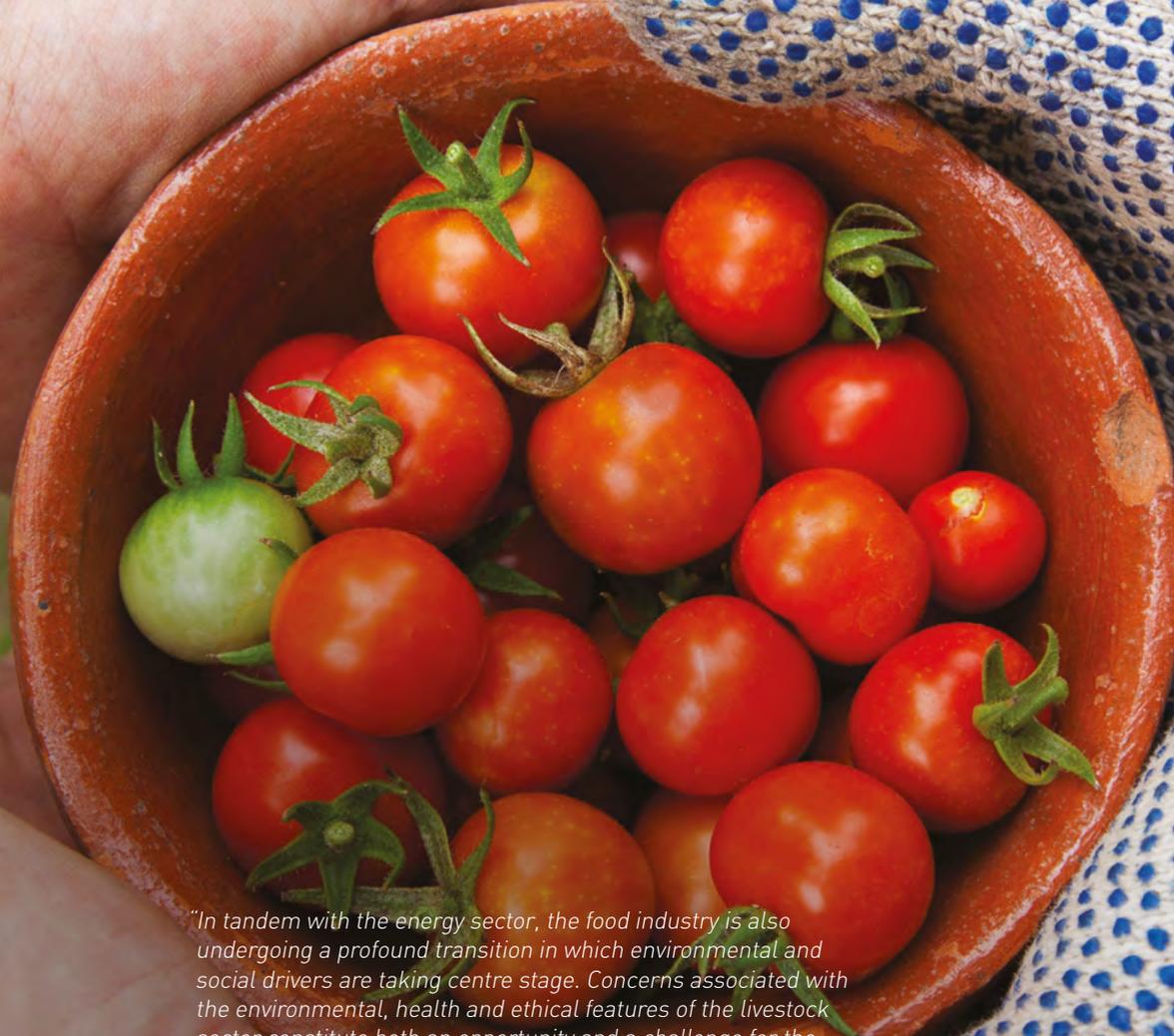
Sycomore Asset Management



Position of traditional food products based on their environmental performance (Quantis 2017 and Sycomore AM calculations, sources: FODGES database from ADEME, Global Footprint Network, FAOSTAT database).

“Based on Sycomore AM’s methodology, companies in the food sector can be positioned based on the NEC ranging from a company selling meat originating from intensive farming with a NEC close to -100% to a company positioned in organic and plant-based food with a NEC close to +100%.”

BNP Paribas



"In tandem with the energy sector, the food industry is also undergoing a profound transition in which environmental and social drivers are taking centre stage. Concerns associated with the environmental, health and ethical features of the livestock sector constitute both an opportunity and a challenge for the industry. We believe that there is increasing evidence that low-calorie/low-carbon products help improve competitiveness, as food seen as healthy and more environmentally friendly continues to win market share against more processed and unhealthy products."

Samuel Mary
Senior Sustainability Research Analyst, Kepler Cheuvreux

KEPLER CHEUVREUX – A COOKBOOK FOR A HEALTHIER PORTFOLIO

Kepler Cheuvreux, a financial services company, has introduced a proprietary 'sustainable food and lifestyle' framework. The framework helps investors assess which companies are well positioned to benefit from the transition to a healthier and sustainable food system, and can help advance the SDGs.

Companies are scored based on: (a) their healthy food exposure, which refers to products that have a positive nutritional impact, and; (b) their green food exposure, which looks at the environmental impact of products. This sustainability food exposure score provides a proxy for assessing a company's contribution to the SDGs. Companies scoring the highest are those focused on fruits, vegetables and organic food.

Relative health impact of food items based on nutrition and environmental pressure criteria

	Health impact				
	Related to environmental pressures				Nutrition
	Climate change	Water consumption	Air pollution	Health impacts as a proportion of total environmental impact	
Cultivation of vegetables, fruit, nuts	●	●	●	Over 50%	●
Cattle	●	●	●	Less than 25%	●

Source: Kepler Cheuvreux (Julie Reynald's report 'Natural Capital Compass. Bigger than carbon, a systemic view') based on Springmann et al (2016).

Kepler Cheuvreux points to the link between diseases and diet. For example, an increase in meat consumption of 100 grams per day leads on average to a 10% higher risk of suffering a stroke.

The firm argues that food companies with a portfolio of products skewed towards nutrition – such as Acom, Wessanen, Danone, Total Produce and Bonduelle – are better placed to benefit from secular growth themes associated with healthy lifestyles than those with significant exposure to products that represent unhealthy food trends. Food and nutrition security is therefore an attractive long-term play for investors.

CANDRIAM INVESTORS GROUP

Candriam is a leading European asset manager with over €100 billion in assets under management. It assesses both the financial and sustainability performance of companies as part of a 'best in class' approach to portfolio selection. Its socially responsible investment (SRI) assessment considers both the business model's intrinsic sustainability and alignment with long-term stakeholders' interests.

Candriam scores both factory farming and businesses earning most of their turnover from animal protein products negatively. This is due to the industry's significant impact on natural resources and high levels of GHG emissions. Instead, Candriam rewards more sustainable approaches to farming. It systematically incorporates animal welfare practices into its SRI analysis, both in relation to livestock farming and animal abuse in sectors such as textiles or pharmaceuticals.

The firm speaks directly to company management, and has joined investor groups to urge action on key issues such as the overuse of antibiotics.

"Candriam engages with companies in the food industry on sustainability issues both during initial investment review and if there are controversies such as food safety scandals. Candriam engages both at individual company and sector levels, and takes part in collaborative engagements such as the FAIRR engagements on antibiotics and sustainable protein; corporates in the food industry have indeed a key role to play in driving innovation behind more sustainable alternatives and a responsibility to nudge consumers towards products with a smaller environmental footprint."

Sophie Deleuze

Senior SRI Analyst, Engagement Specialist,
Candriam Investors Group

COMPANY ENGAGEMENT

Investors are engaging with companies either through joining collaborative engagements, like the one being facilitated by FAIRR, or by incorporating the issue into individual company engagement. The purpose is to understand how companies are mitigating and/or capitalising on risks and opportunities linked to protein diversification to ensure long-term value creation for shareholders.

Investor resource – key questions for engagement

How would you rank yourself against your peers and competitors in terms of your company's ability to meet the increasing demand for plant-based diets?

What percentage of your current own-brand portfolio (by stock keeping units or any other meaningful measure) is reliant (i.e. listed as an ingredient) on animal proteins (poultry, livestock, fish, dairy, eggs)? Have you undertaken a risk/impact assessment on this protein mix? How will this change over the next five years?

Across the company, what percentage of your annual revenues will come from products that align with plant-based diets (including produce and proteins)? How will this change over the next five years?

What percentage of your product development (including R&D) budget across your brands focuses on product concepts that meet plant-based diets?

What are the greatest barriers you face when it comes to developing a global, comprehensive protein diversification strategy?

What external resources will be most useful to help you accelerate the development of a global, comprehensive protein diversification strategy?

Is increasing sustainable protein offerings a priority for your company over the next five years? If so, are efforts driven by consumer demand, competitive pressures, market opportunities, adherence to environmental goals, or another factor?

THE FOOD INDUSTRY IS EMBRACING ALTERNATIVE PROTEINS TO DRIVE GROWTH

The food industry has undergone a revolution in the last decade. Consumers have increasingly gravitated towards 'clean label' products that are ethically sourced, sustainable and healthy. The alternative protein market is one of the biggest beneficiaries of this shift, as companies seek to leverage consumer interest to build new avenues of growth, expand their customer base and de-risk their supply chains.

Companies are broadening their alternative protein portfolios using three key strategies:

Acquisitions:	Venture investments:	Product development and R&D:
<p>Large food companies have been acquiring plant-based and alternative protein companies to expand their offering of non-meat proteins, as part of a trend towards greater consolidation within the food industry.</p>	<p>Established players have launched venture capital units to buy into, learn from, and eventually help scale up potentially disruptive start-ups offering innovative alternative protein products.</p>	<p>Across the food value chain, companies are looking to generate growth through innovation and product development in alternative proteins, both within their legacy brands and by creating new product offerings.</p>
<p>Recent acquisitions include:</p> <ul style="list-style-type: none"> • Danone’s \$12.5 billion acquisition of WhiteWave, a global manufacturer of branded plant-based foods and beverages; • Campbell’s Soup’s deal to buy Pacific Foods, maker of shelf-stable, plant-based milk products, for \$700 million in 2017; • Pinnacle’s purchase of Gardein for \$158 million in late 2014 (after which net sales grew double digits in 2016, even with constrained capacity); • major Canadian meat processor Maple Leaf’s recent acquisition of two plant-based brands: Lightlife, manufacturer of refrigerated plant-based foods; and Field Roast, a brand of grain-based ‘meat’ and vegan cheese products. 	<p>High-profile venture investments include:</p> <ul style="list-style-type: none"> • Tyson Ventures’ 5% stake in Beyond Meat, manufacturer of plant-based meat substitutes; • Cargill and Tyson investments in cultured meat start up Memphis Meat; • Kellogg’s \$100 million investment fund, which led a fundraising round by plant-based smoothies maker Bright Greens and has invested in Kuli Kuli, makers of plant protein products; • General Mills’ establishment of incubator 301 Inc and investment in Beyond Meat and Kite Hill, a plant-based dairy company. 	<p>Alternative protein product developments include:</p> <ul style="list-style-type: none"> • ingredient makers such as ADM developing their range of plant-based ingredients and protein ranges that can be readily used by manufacturers; • Unilever’s collaboration with Givaudan, Ingredion and the University of Wageningen to develop a plant-based steak using innovative ‘shear cell’ technology, which transforms vegetable proteins into a layered, fibrous structure matching the appearance and texture of steak; • retailers, including Kroger, Ralphs, Target, Trader Joe’s, Wegmans and Whole Foods, developing multiple meat replacement products within their own-brand ranges, one of the fastest-growing categories for retailers.



HOW DANONE CAPTURED GROWTH THROUGH PLANT-BASED ACQUISITION

In the US, non-dairy milk sales have increased by 61% over the last five years, while dairy milk sales have dropped by 15%. The trend extends to organic milk and other dairy products: for example, organic milk sales dropped by 2.5% in 2017, while dairy-free varieties now make up 4% of all new ice cream launches.

In 2016, Danone made a play on this growth through its acquisition of WhiteWave, an established maker of plant-based brands such as Alpro and Silk. DanoneWave is now a top 15 US food and beverage company whose mission is to bring “healthy food to as many people as possible”. Since the acquisition, the company has announced a \$60 million investment in its US plant-based beverage manufacturing operations. It also launched an expansive, multi-million dollar campaign to promote its newly acquired vegan ice cream brand, So Delicious.

Early financial outcomes

In October 2017, Danone’s North America essential dairy and plant-based unit posted sales of \$1.5 billion, up significantly from \$738 million for the same period the year before. According to Food Dive, when factoring in WhiteWave’s sales as a standalone company last year, sales for the overall newly constituted company rose 4.7% to \$7.61 billion compared to the year-ago period. And in the 52 weeks ending 29 April 2017, So Delicious frozen dessert sales in the US increased 15%, while sales of its creamers, yogurt alternatives and almond milk beverages jumped by 21%.

“By combining 100 years of dairy fermentation with plant-based technology we can reach customers all around the world through multi-channels and invest in sustainable nutritious solutions for tomorrow. We will redefine what dairy and plant-based mean.”

Danone CEO, Emmanuel Faber, Financial Times 2017

QUORN GROWTH ACCELERATES GLOBALLY

Quorn is an alternative protein product using mycoprotein as an ingredient. Founded in 1985 by Marlow Foods in the UK, Quorn is now available in 19 countries worldwide and replicates most meat cuts – from ingredients to pre-made meals.

In 2015, the company was bought from Exponent Private Equity by Philippine food manufacturer Monde Nissin for £550 million. Since the sale, Quorn has seen “unprecedented” global expansion: 16% year-on-year growth in 2017, with the same expected in 2018. The company is seeing a surge across many regions, particularly in the USA, Australia and Nordics.

Quorn Foods CEO Kevin Brennan puts this down to a confluence of factors: “Globally, there is a consistent trend of younger, more educated consumers looking to cut down on meat consumption. This is driven by concerns regarding the health and sustainability issues associated with meat. This is then enhanced by Quorn’s strong presence in store, strong innovation, wide choice of products and strategic marketing campaigns targeted at a broad audience of meat reducers.... In the past ten years we have seen a shift from vegetarians as the majority of [our] consumers to 75% today being meat reducers.”

With a focus on growth in both its key current markets and expanding into Asia, the Quorn growth story looks set to continue in 2018 and further ahead. Monde Nissin CEO Henry Soesanto commented: “We purchased Quorn as it was a great solution to major health and sustainability issues. With increased investment, we have doubled growth rates and expect to maintain 15% growth for the next decade.”

FAIRR SUSTAINABLE PROTEIN ENGAGEMENT: USING INVESTOR INFLUENCE TO ENCOURAGE COMPANIES TO DIVERSIFY PROTEIN SOURCES

“The global food system is under increasing pressure and shareholders have a key role to play to spur leading food multinationals towards a more sustainable protein supply chain. From reformulation recipes to supermarket shelf space, FAIRR’s engagement is proving an important catalyst to help companies understand the long-term risks and seize the market opportunities.”

Abigail Herron

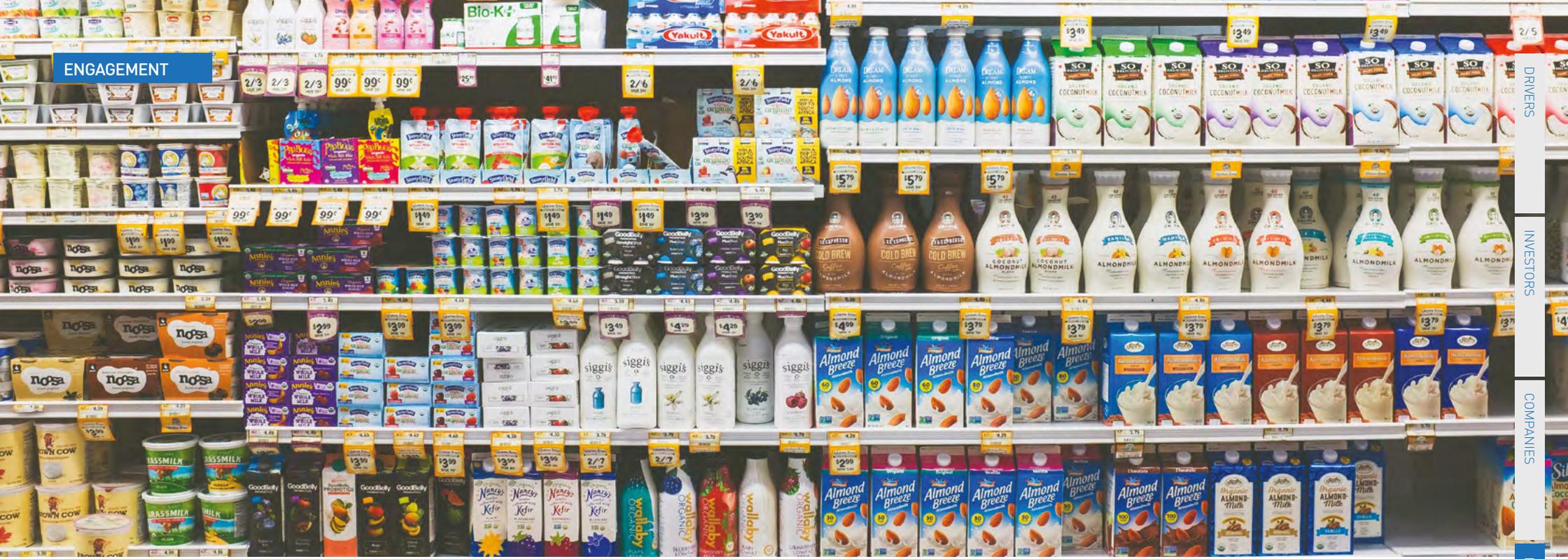
Global Head of Responsible Investment,
Aviva Investors

In 2016, FAIRR launched a first-of-its-kind collaborative investor engagement to encourage large food manufacturers and retailers to diversify their protein sources.

The financial case for the 57 institutional investors backing the engagement was clear: the need for the food industry to capitalise on the extensive growth opportunity in the alternative protein market.

The investors’ support was also driven by a recognition of the vast array of ESG risks associated with traditional animal protein sources that will constrain future growth opportunities. The scale of the risks facing this sector make sustainable agriculture practices necessary, but not sufficient. Shifting consumption patterns to largely plant-based diets must also be part of the solution. Protein diversification is therefore a financially material factor that can impact a food company’s core business value proposition – including its growth, profitability, risk exposure and ability to compete and innovate.

For these reasons, investors are asking leading global companies to develop a protein diversification strategy that is global, evidence-based and comprehensive. Such a strategy can help companies future-proof their supply chains, successfully manage long-term sustainability trends and act as an engine for value creation and growth.



ABOUT THE COMPANIES IN THE ENGAGEMENT

\$1.1

TRILLION IN MARKET
CAPITALISATION

57%

HEADQUARTERED IN
EUROPE, INCLUDING UK

43%

HEADQUARTERED IN THE US

2/3

ARE RETAILERS

1/3

ARE FOOD MANUFACTURERS

\$1.2

TRILLION GENERATED
IN REVENUES BETWEEN
2016 AND 2017

3

COMPANIES HAVE A GOAL TO
INCREASE THEIR PORTFOLIO
OF ALTERNATIVE PROTEINS

6

COMPANIES HAVE TARGETS
TO REDUCE GHG EMISSIONS
ASSOCIATED WITH THEIR
AGRICULTURE SUPPLY CHAINS

5

COMPANIES PARTICIPATE
IN CROSS-SECTORAL
COLLABORATIONS ON
PROTEIN DIVERSIFICATION

Zero

COMPANIES HAVE
REPORTED A METRIC
THAT MEASURES
THEIR PROTEIN MIX

All

COMPANIES MARKET
AT LEAST ONE OWN-
BRAND ALTERNATIVE
PROTEIN PRODUCT

ENGAGEMENT PROCESS

Phase 1: Exploration

In phase 1, FAIRR's engagement team identified 16 global food companies – both manufacturers and retailers – based on their exposure to animal protein supply chains and their sensitivity to consumer trends. The objective of phase 1 was to raise awareness of the issue with companies and to assess their current thinking. Companies were contacted by post and email in September 2016, with follow-up calls as needed. Forty investors, with \$1.25 trillion in AUM, supported phase 1.

Of the 16 companies, 13 sent meaningful responses. Kroger and Whole Foods did not respond, and Costco's response was inadequate.

Phase 2: Information gathering

In phase 2, FAIRR facilitated investor follow-up with companies to seek specific information on how they were diversifying protein sources. The objective was to clarify companies' strategic approach, including whether they had conducted a risk assessment of their portfolio's current protein mix; developed metrics to measure their exposure to different protein sources; and were directing their R&D budgets to develop plant-based product concepts. Investors specifically asked for a meeting with company representatives to discuss their responses.

The coalition had meetings with 50% of the companies in the engagement. Of the 16 companies, only Whole Foods did not respond to the investor request. Costco and Morrisons acknowledged investor concerns but did not provide an update.

EVALUATION FRAMEWORK

Protein diversification is a complex issue. No clear roadmap currently exists for companies to undertake a protein diversification strategy. FAIRR developed the criteria for this framework based on a review of best practices by food companies across several areas, including strategy, innovation, engagement and metrics. The criteria includes elements that we believe will be necessary for a comprehensive approach to increase company exposure to alternative proteins. We think this criteria is a first step towards helping investors evaluate company performance in public markets, and progress towards increasing access to plant-based foods and alternative proteins.

We assessed companies against the criteria based on their responses to the two investor letters sent in September 2016 and July 2017. We also supplemented the responses with notes from company meetings/calls (where relevant) and with public information (where available). A high-level overview of the assessment is available on page 58. FAIRR members also received an in-depth assessment of each company.

"The way global food companies like Walmart or Kraft Heinz source protein for their products is linked to increasingly urgent environmental and public health risks. Investors want to know if companies have in place protein diversification strategies to mitigate risks and reduce negative impact. Green Century Capital Management has been engaging on this issue since 2016 given its direct connection to our core focus areas: climate change and deforestation. FAIRR's Sustainable Protein engagement has provided us, the investor community, and companies with a framework to adapt to and profit from the shift toward a more sustainable global diet. Along with FAIRR, we strive for a diet that takes a bigger bite from the growing plant-based protein market."

Marissa LaFave

Shareholder Advocate, Green Century Capital Management



Evaluation Framework

Strategy: Nearly all companies in our engagement seek to provide healthier product options and manage their supply chain impacts from deforestation, GHG emissions and water use and pollution. Protein diversification is a necessary element to reducing their impacts in these areas. We assessed companies' business and/or sustainability strategies on goals related to supply-chain emissions and protein diversification.

Innovation and product development: We assessed the extent to which companies focus on internal and cross-sectoral R&D to develop new protein and plant-based products.

Product offers: We assessed if companies had a clear strategy to increase the number of alternative protein products through product development and/or acquisitions, and the variety and visibility of products offered online.

Consumer engagement: One of the biggest barriers to increased adoption is that consumers may not accept protein alternatives because of preconceptions about taste, texture and health. We assessed how successfully companies were employing food marketing, branding and advertising – long used to create demand for new product categories – to drive consumer acceptance of protein alternatives.

Tracking and reporting: We assessed if companies were tracking, or had the ability to track, data to measure their protein mix. We also assessed if companies were reporting this data externally.

Engagement with investors: We assessed the engagement level of companies based on whether they met with investors for a candid discussion of their progress and performance on this issue.

Criteria

1. Does the company have a target to reduce supply-chain emissions, including agricultural emissions?
2. Does the company have goals to shift to diversified protein sources?
3. Does the company dedicate internal R&D to new product development?
4. Does the company participate in cross-sectoral collaborations on protein diversification?
5. Does the company seek to reformulate existing product ranges to substitute animal-derived ingredients where possible?
6. **For retailers** Is the company proactively seeking to offer innovative external products to increase its alternative protein portfolio?
For manufacturers Has the company made acquisitions or start-up/incubation investments to increase its alternative protein portfolio?
7. Does the company market at least one range of own-brand, alternative protein products?
8. Does the company engage with consumers and stakeholders to discuss the benefits of alternative proteins, and is this part of a dedicated marketing and promotion strategy?
9. Does the company track data on percentage of animal proteins sourced for its food products?
10. Does the company track data on percentage of sales related to own-brand non-protein products?
11. Does the company report on protein sales and/or sourcing data externally?
12. Has the company engaged with the investor coalition?

What does best practice look like?

Reduction targets that specifically seek to reduce percentage-based absolute emissions from the agricultural supply chain. For example, Tesco aims to achieve 'absolute' reductions, based on 2015 levels of: 35% by 2030 (15% for agricultural emissions). This will contribute to an overall 'Scope 3' reduction of 17% by 2030.

Goals with clear timelines that can be accurately measured and reported. For example, by [date], XX% of our proteins will be derived from plant-based ingredients or XX% of our sales in [product category] will come from products that are entirely plant-based.

Evidence of an R&D and product development strategy specifically focused on plant proteins. For example, Nestlé monitors what percentage of its R&D investment is dedicated to discovery projects on plant proteins.

The company takes part in several initiatives focused on finding solutions to the protein challenge. For example, Unilever is part of a consortium of companies and academic researchers (Plant Meat Matters) looking to develop a plant-based steak.

The company is proactive about reducing animal ingredients in existing product ranges where technically and commercially feasible. For example, Tesco has said that it is removing minor ingredients from products, which make them unsuitable for vegetarians and vegans, wherever they are able to do so with no impact to overall product quality.

The retailer proactively seeks to offer customers innovative external alternatives to animal proteins across categories. For example, more than 650 select Kroger-owned stores across 14 states in the US now carry the plant-based Beyond Burger in their meat aisles.

The manufacturer has been involved in start-up/incubation investment in the last five years, focused on increasing its product portfolio on innovative plant-based products. For example, General Mills' venture capital arm 301 Inc invests in innovative food start-ups including plant-based brands such as Kite Hill and Rhythm Foods.

The company offers a variety of own-brand alternative proteins across categories. Their plant-based options are easy to find. For example, Sainsbury's offers an extensive range of meat alternatives such as minces, meat-free meat balls and burgers, as well as cheese and dairy alternatives within its Sainsbury's brand. It also offers several ready meals.

The company has a comprehensive marketing and promotions strategy that is focused on growing sales from plant-based products, including product design and development; marketing and messaging; advertising, pricing and promotions; labelling; choice architecture; and customer engagement. While best practice is hard to define, given the many elements involved, Tesco presents a good case study. In 2016, the supermarket chain hired a celebrity plant-based chef as its Director of Plant-Based Innovation. In addition, Tesco released a 'fully integrated' campaign centred on healthy eating, including television, social, digital and out-of-home marketing spots. It also developed plant-based ready-meal product ranges.

A global metric that provides measurement of the company's exposure to animal proteins and plant-based proteins. For example, Nestlé tracks this metric and monitors what percentage of its proteins are derived from plant-based ingredients.

A global metric that provides measurement of the company's exposure to plant-based product sales.

The company reports relevant metrics externally to help investors assess company exposure to animal proteins and plant-based portfolios.

Direct engagement with investor coalition. Candid discussion of drivers and barriers. The investor coalition had meetings that met our criteria as best practice with the following companies: Kroger, Nestlé, Mondelez, Ahold Delhaize and Tesco.

FINDINGS

Despite agriculture accounting for the majority of value-chain emissions, most companies do not have any meaningful programmes to track, report and reduce supply-chain emissions related to agriculture.

- Only six companies – **M&S, Tesco, Walmart, General Mills, Nestlé and Unilever** – have targets to reduce supply-chain emissions from agriculture. Other companies are heavily exposed to meat and dairy products, but do not discuss the impacts associated with their supply chains.

What we would like to see: Ambitious targets to reduce emissions from livestock supply chains, while working to improve animal welfare, eliminate forest loss and manage water use.

Companies acknowledge the materiality of protein diversification for their business, but primarily to meet changing consumer demand, rather than as a way to decouple growth from sustainability impacts.

- Only **Tesco, M&S, Nestlé and Unilever** clearly articulate the case for alternative proteins and meat/dairy reduction as being necessary for addressing their impacts as a business.
- Other companies fail to acknowledge this connection despite all of them working to address supply-chain impacts such as GHG emissions, deforestation, water use and pollution.
- The lack of articulation on risks related to animal protein production is preventing companies from integrating protein diversification into their business/sustainability strategies. Only three companies – **M&S, Nestlé and Unilever** – have some form of internal and external goal linked to increased protein diversity within their businesses.

What we would like to see: A risk assessment on the company's exposure to animal proteins, which assesses whether the business can continue to operate sustainably if meat and dairy follow projected trends. We would like companies to set a quantitative goal to increase exposure to alternative protein sources based on assessment findings.

All companies now offer own-brand products that substitute meat and/or dairy, responding to growing consumer demand for these products.

- Several companies referenced dedicated internal resources (R&D, product development, procurement) that focus on developing and/or acquiring plant-based products and ingredients. This is a consequence of growing consumer demand for these products. We believe that companies can scale up research and product development if they also approach diversification from a risk-based perspective.
- Companies are currently focusing on new product development, rather than reformulating existing products to remove animal-derived ingredients.
- Three manufacturers – **Nestlé, Unilever and General Mills** – have made acquisitions or incubation investments to increase their portfolio of plant-based products.
- Two cross-sectoral collaborations focused on protein diversification with the broadest participation are Forum for the Future's Protein Challenge 2040 and the World Resources Institute's Better Buying Lab. The Forum focuses on pilot projects to shift the protein system to become less resource-intensive. The Lab focuses on behavioral science to help consumers select sustainable foods.

What we would like to see: A strategic plan, with dedicated budget, to develop or procure alternative protein products that mimic the functional properties and taste profile of animal proteins, and research on how to 'nudge' consumer behavior.



Companies are struggling to develop coherent messaging and marketing to promote and encourage consumption of alternative protein products.

- Retailers in the engagement expressed reluctance to ‘lead’ or ‘create’ consumer demand for shifting diets, rather than simply respond to existing demand.
- There is a lack of consensus about the right choice architecture interventions to nudge consumers to buy meat and dairy substitutes. Some companies have placed these products in the meat/dairy aisles to broaden their appeal. Others advocate displaying these products in separate but easily identifiable locations to help consumers that follow specific diets (vegan/vegetarian). This lack of consensus makes it crucial for companies to have systems that can continuously monitor consumer preferences at the sub-category level to change purchasing habits.
- Similar confusion exists on how to label products to attract consumers. Recent research from the Better Buying Lab suggests that using indulgent labels, rather than healthy restrictive terms like vegan or vegetarian, can increase the proportion of people choosing alternative protein products (World Resources Institute n.d.).

What we would like to see: A marketing plan that is based on capturing and growing market share in every category where animal proteins are widely consumed.

Very few companies have developed the right metrics to capture and track progress on increasing exposure to alternative protein sources.

- **Nestlé and Unilever** track an enterprise-wide metric on the percentage of their proteins that are derived from animal and plant-based ingredients.
- For retailers, it has proven particularly difficult to identify the right metrics. **Tesco** shared the percentage of its products within categories (chilled, frozen and grocery) that it believes are best placed to shape meat-free or vegan offers for customers.
- Similar to the movement to reduce sugar and salt, it is important that retailers and manufacturers define the right metrics as a way of measuring progress and setting targets to increase their exposure to alternative proteins.

What we would like to see: Metrics that accurately measure companies’ exposure to animal-derived ingredients, so that firms can set realistic targets to reduce it.



COSTCO DOES NOT ADDRESS RISKS ASSOCIATED WITH ITS LIVESTOCK SUPPLY CHAINS

Costco is one of the world’s largest meat sellers. Annually, it sells around 83 million rotisserie chickens in the US, and is one of the world’s largest sellers of choice and prime beef. To meet demand, the company is building a poultry processing plant that is expected to process 100 million birds each year. Despite this exposure and the scale and influence of its business, the company does not meaningfully address the environmental footprint of its meat supply chains. Furthermore, it does not regard protein diversification as a material issue for the business.

- **No discussion of livestock’s environmental impacts:** Costco has no meaningful discussion on emissions associated with livestock farming, and does not measure or target Scope 3 emissions. We also found no discussion of water use related to livestock farming, which accounts for one third of the total water footprint of agriculture. Research has estimated that the average water footprint per calorie for beef is 20 times larger than for cereals and starchy roots.
- **Costco faces reputational risks in its livestock supply chains:** Costco’s planned chicken processing plant in Nebraska – expected to be one of the country’s largest – is facing community protests due to fears that the associated farming expansion will impact local water quality.
- **Costco has no plans to diversify its protein offerings:** Unlike most other retailers in our engagement, Costco’s private brand label, Kirkland Signature, offers only a limited range of dairy substitutes – indicating that alternative proteins is not an area of focus for the company’s product development teams. While Costco offers a wide range of external plant-based brands, its website does not clearly categorise items as such. Costco has said that it has not received substantial demand from customers to expand these offerings. In the absence of that demand, Costco currently does not plan to do so.
- **Poor engagement with investors:** Costco sent inadequate responses to investor letters and did not respond to requests for meetings.



Image © Wicked Healthy



Image © Wicked Healthy

COMPANIES WITH LEADING APPROACHES

RETAILER: TESCO

Why Tesco leads:

- **Strong programme to tackle livestock emissions:** Tesco has a comprehensive programme to reduce emissions associated with its livestock supply chains. It has also set a target to reduce agricultural emissions by 15% by 2030.
- **Acknowledges risk related to protein consumption:** In its letter to investors, Tesco recognises that in addition to sustainability improvements to livestock, plant-based diets will be necessary to meet its supply-chain targets.
- **Leading consumer demand through innovative product development and marketing:** Tesco presents a best-practice case study for how a retailer can lead consumer demand for alternative proteins and plant-based foods. In January 2018, it introduced 20 ready meals with plant-based options under its Wicked Kitchen brand, developed by its director of plant-based innovation who is a well-known celebrity chef. The marketing of the brand has attracted extensive media coverage, and its labelling is designed to appeal to a wide range of consumers, not just vegans.
- **Strong engagement with investors:** Tesco representatives met with investors for a candid discussion of its plans and progress on alternative proteins. They responded to all investor questions with detailed answers.

MANUFACTURER: NESTLÉ

Why Nestlé leads:

- **Strong target to tackle Scope 3 emissions:** While Nestlé does not specifically call out agriculture, it has a target to reduce Scope 3 GHG emissions by 8% between 2014 and 2020.
- **Acknowledges risk related to protein consumption:** In its letter to investors, Nestlé recognises the need to shape sustainable consumption to preserve the planet for future generations.
- **Robust research process to investigate alternative proteins:** Nestlé has an internal R&D network focused on protein innovation, including plant proteins. It organises an annual protein summit where external experts are invited to present on the latest developments. Over a quarter of its R&D investment is dedicated to discovery projects on plant proteins. These are aimed at ensuring safety and compliance, and delivering sound nutritional profiles. Nestlé has also hired a dedicated strategic buyer to coordinate development of plant protein ingredients with suppliers.
- **Strong engagement with investors:** Nestlé representatives met with the investor coalition for a candid discussion of its plans and progress on alternative proteins. They responded to all investor questions with detailed answers.



Jeremy Coller
Milken Conference 2017

FAIRR'S WORK TO ENGAGE STAKEHOLDERS

We engage and work in partnership with a wide range of stakeholders, including investor groups, NGOs, regulators and academics.

A snapshot from 2017:

PRI in Person – Principles for Responsible Investment: The FAIRR team presented a session on food technology and innovation to global investors at the 2017 PRI in Person, the leading global conference on responsible investment

Sustainable protein event hosted by Neuberger Berman, NYC: FAIRR organised an investor briefing to discuss the risks and opportunities presented by protein supply chains, featuring speakers from The Good Food Institute, Lux Research, Tyson Ventures, Impax Asset Management, the World Resources Institute and Green Century Capital Management

COP 23, Bonn: As part of the Institute for European Environmental Policy (IEEP)'s event on pathways to low-carbon EU agriculture, FAIRR's Director Maria Lettini presented on the need for developed-world countries to urgently reduce livestock emissions

EAT Food Forum in Stockholm: FAIRR Founder Jeremy Coller gave a plenary session to the conference's influential audience on the risks linked to intensive livestock production and opportunities presented by sustainable proteins

Ceres Conference, San Francisco: Jeremy Coller joined renowned food journalist Mark Bittman and Beyond Meat Founder and CEO Ethan Brown in a plenary discussion on the importance of food sustainability for investors

Local Authority Pension Plan Forum Annual Conference 2017: Alongside FAIRR member Aviva Investors, Jeremy Coller presented on FAIRR's issues to an audience of local authority pension funds

REFERENCES

- Allied Market Research, 2016. Meat Substitute Market. <https://www.alliedmarketresearch.com/meat-substitute-market>
- Bloomberg, 2017. 'JBS Said to Delay New York Initial Offering After Meat Scandal.' <https://www.bloomberg.com/news/articles/2017-05-10/jbs-said-to-delay-new-york-initial-offering-after-meat-scandal>
- Bloomberg Intelligence, 2017. Substitute Meat Market Poised for Growth.
- Dean Foods, 2017. 'Dean Foods and Good Karma Foods strike investment and distribution deal to accelerate brand growth.' <http://www.deanfoods.com/our-company/news-room/press-release.aspx?StoryID=2270482>
- The Economist, 2017. 'What's in New Zealand's water?' <https://www.economist.com/blogs/economist-explains/2017/12/economist-explains>
- Etemadi, Arash et al., 2017. 'Mortality from different causes associated with meat, heme iron, nitrates, and nitrites in the NIH-AARP Diet and Health Study: population based cohort study.' *BMJ* 2017, 357: j1957. <http://www.bmj.com/content/357/bmj.j1957>
- Financial Times, 2016. 'Big business identifies appetite for plant-based milk.' <https://www.ft.com/content/7df72c04-491a-11e6-8d68-72e9211e86ab>
- Gerber, P. J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Faluccci, A. and Tempio, G., 2013. Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome.
- Global Food Forums, 2017 and 2018. '2017 Food Trends' and '2018 Food Trends'. <https://www.globalfoodforums.com/food-news-bites/2017-food-trends/> and <https://www.globalfoodforums.com/food-news-bites/2018-food-trends/>
- Good Food Institute, Plant Based Foods Association and Nielsen, 2017. 'Plant Based Foods Sales Experience 8.1 Percent Growth Over Past Year.' <http://www.prweb.com/releases/2017/09/prweb14683840.htm>
- The Guardian, 2017a. 'A million tons of feces and an unbearable stench: life near industrial pig farms.' <https://www.theguardian.com/us-news/2017/sep/20/north-carolina-hog-industry-pig-farms>
- The Guardian, 2017b. 'Rise of mega farms: how the US model of intensive farming is invading the world.' <https://www.theguardian.com/environment/2017/jul/18/rise-of-mega-farms-how-the-us-model-of-intensive-farming-is-invading-the-world>
- Harwatt, H., Sabaté, J., Eshel, G., Soret, S. and Ripple, W., 2017. 'Substituting beans for beef as a contribution toward US climate change targets'. *Climatic Change* 2017, 143: 1-2. <https://link.springer.com/article/10.1007%2Fs10584-017-1969-1>

Hedenus, F., Wirsenius, S. & Johansson, D.J.A., 2014. 'The importance of reduced meat and dairy consumption for meeting stringent climate change targets.' *Climatic Change* 2014, 124: 79. <https://doi.org/10.1007/s10584-014-1104-5>

Lux Research, 2014. Whoopie: Plant Sources Are Changing the Protein Landscape. <https://members.luxresearchinc.com/research/report/16091>

MarketsandMarkets. n.d. 'Meat Substitutes Market worth 5.96 Billion USD by 2022.' Accessed 24 January 2018. <https://www.marketsandmarkets.com/PressReleases/meat-substitutes.asp>

Mintel, 2015. 'Young Consumers Are Hungry For Meat Alternatives in Germany.' <http://www.mintel.com/press-centre/food-and-drink/young-consumers-are-hungry-for-meat-alternatives-in-germany>

Mintel, 2017. 'Europe leads in innovation as meat-free demand grows.' <https://www.foodnavigator.com/Article/2017/08/24/Europe-leads-in-innovation-as-meat-free-demand-grows#>

Nielsen, 2017. 'Plant-based proteins are gaining dollar share among North Americans'. <http://www.nielsen.com/us/en/insights/news/2017/plant-based-proteins-are-gaining-dollar-share-among-north-americans.html>

OECD/FAO, 2017. *OECD-FAO Agricultural Outlook 2017-2026*. OECD Publishing, Paris. http://dx.doi.org/10.1787/agr_outlook-2017-en

Persistence Market Research, 2017. 'Asia Pacific to be the Fastest Growing Region in the Global Plant-Based Proteins Market During 2017 - 2025.' <https://www.persistencemarketresearch.com/mediarelease/plantbased-protein-market.asp>

Quartz, 2018. 'The average American will eat the equivalent of 800 hamburgers in 2018.' <https://qz.com/1171669/the-average-american-will-eat-the-equivalent-of-800-hamburgers-in-2018>

Rabobank, 2017. Watch out... or They Will Steal Your Growth! <https://research.rabobank.com/far/en/sectors/animal-protein/Why-Alternative-Proteins-Are-Competing-for-the-Centre-of-the-Plate.html>

Research and Markets, 2017. *Global Plant Protein Market 2017-2021*. https://www.researchandmarkets.com/research/gsv3jm/global_plant

Tilman, D. and Clark, M., 2014. 'Global Diets Link Environmental Sustainability and Human Health.' *Nature* 515: 518-22. <https://www.nature.com/articles/nature13959>

Van Boeckel, T. P. et al., 2017. 'Reducing antimicrobial use in food animals.' *Science* 357, 6358: 1350-2. <http://science.sciencemag.org/content/357/6358/1350.full>

Virtanen, H., Koskinen, T., Voutilainen, S., Mursu, J., Tuomainen, T., Kokko, P. and Virtanen, J., 2017. 'Intake of different dietary proteins and risk of type 2 diabetes in men: The Kuopio Ischaemic Heart Disease Risk Factor Study.' *British Journal of Nutrition* 117(6): 882-93. <https://doi.org/10.1017/S0007114517000745>

Wolf, J., Asrar, G. R. & West T. O., 2017. 'Revised methane emissions factors and spatially distributed annual carbon fluxes for global livestock.' *Carbon Balance Management* 2017, 12(1):16. <https://doi.org/10.1186/s13021-017-0084-y>

World Resources Institute, 2014. *Creating a Sustainable Food Future*. <http://www.wri.org/resources/presentations/creating-sustainable-food-future-improving-productivity-and-environmental>

World Resources Institute. n.d. 'Better Buying Lab: Three Areas of Innovation.' Accessed 24 January 2018. <http://www.wri.org/our-work/project/better-buying-lab/three-areas-innovation>

JOIN FAIRR'S COLLABORATIVE ENGAGEMENT ON SUSTAINABLE PROTEIN

Our engagement on sustainable protein calls on global retailers and food manufacturers to think strategically about building sustainable protein supply chains.

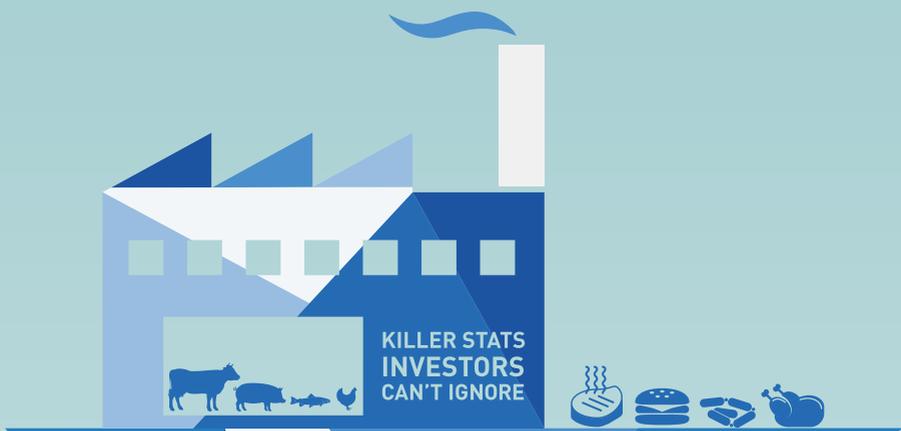
The engagement is currently backed by 57 investors with combined assets under management of \$2.4 trillion.

To learn more, contact the FAIRR engagement team:

Rosie Wardle
Head of Investor Engagements
 Rosie.wardle@fairr.org

Aarti Ramachandran
Head of Research and Corporate Engagement
 Aarti.Ramachandran@fairr.org

Jo Raven
Investor Engagement Officer
 Jo.raven@fairr.org



**KILLER STATS
INVESTORS
CAN'T IGNORE**

**ANTIBIOTIC
RESISTANCE**

**GREENHOUSE GAS
EMISSIONS**

POLLUTION

WASTE

**WORKING
CONDITIONS**

DISEASE

**PUBLIC
OPPOSITION**

**LOSS OF
SUBSIDIES**

**CHANGES IN
REGULATION**