



# Shaping the Future of Protein

The Protein Challenge 2040:  
Accelerating Innovation and Action

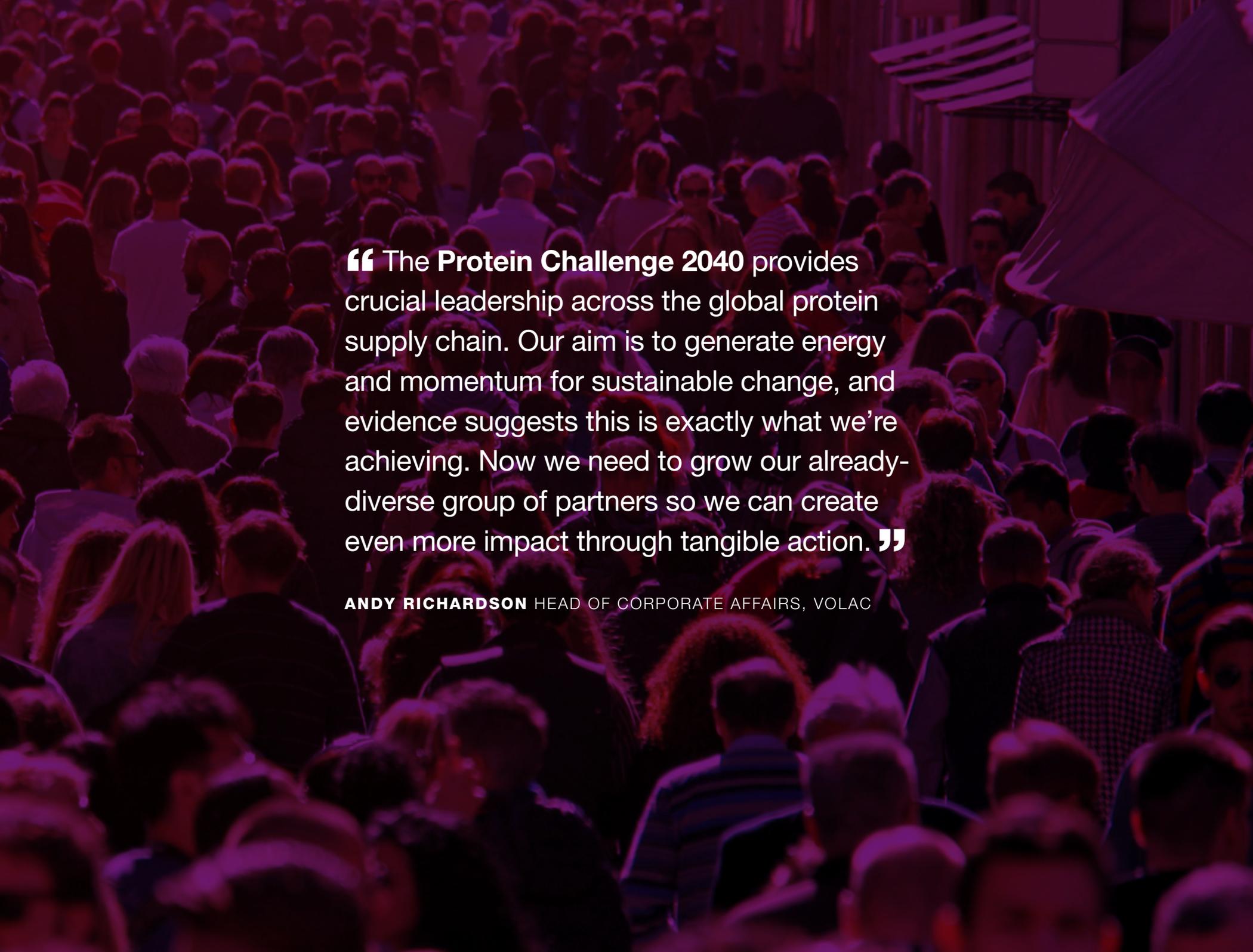


How can we meet the protein needs of **9 billion** people in a way that is affordable, healthy and good for the environment?

Don't sit on the side lines.  
Do you want to get involved  
in helping shape the future  
of protein?

**Get in touch.**

[S.billing@forumforthefuture.org](mailto:S.billing@forumforthefuture.org)



“ The **Protein Challenge 2040** provides crucial leadership across the global protein supply chain. Our aim is to generate energy and momentum for sustainable change, and evidence suggests this is exactly what we’re achieving. Now we need to grow our already-diverse group of partners so we can create even more impact through tangible action. ”

**ANDY RICHARDSON** HEAD OF CORPORATE AFFAIRS, VOLAC

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## The **future of protein**

Protein is an essential part of human and animal diets, but the ways we produce and consume it are unsustainable.

We envisage a future in which everyone has access to healthy, affordable nutrition, where sustainable animal protein is well-balanced with plant and alternative proteins on the plates of people all over the world, having been produced within environmental limits. The scope of the challenge is vast, but can be realised with collaborative action. We intend to achieve our vision by acting throughout the protein system, addressing critical areas of production and consumption across the value chain.

**Do you want to be part of shaping this brighter future?**



## The Protein Challenge 2040

The Protein Challenge 2040, a ground-breaking international pre-competitive collaboration, has set out to address these challenges head-on.

This is the first time that the global animal, plant and novel protein industries are working together, with the aim of accelerating progress towards sustainable production and consumption of protein, and helping to scale impactful solutions.

**Now is the time to put our plans to action and we are looking for leaders to join the challenge.**

### BY 2020, THE PROTEIN CHALLENGE WILL HAVE:



Raised the profile of protein as an integral and important part of a sustainable food system with key stakeholders, including business and government.



Changed the conversation around protein: from 'good' and 'bad' sources towards a better balance of sustainable protein.

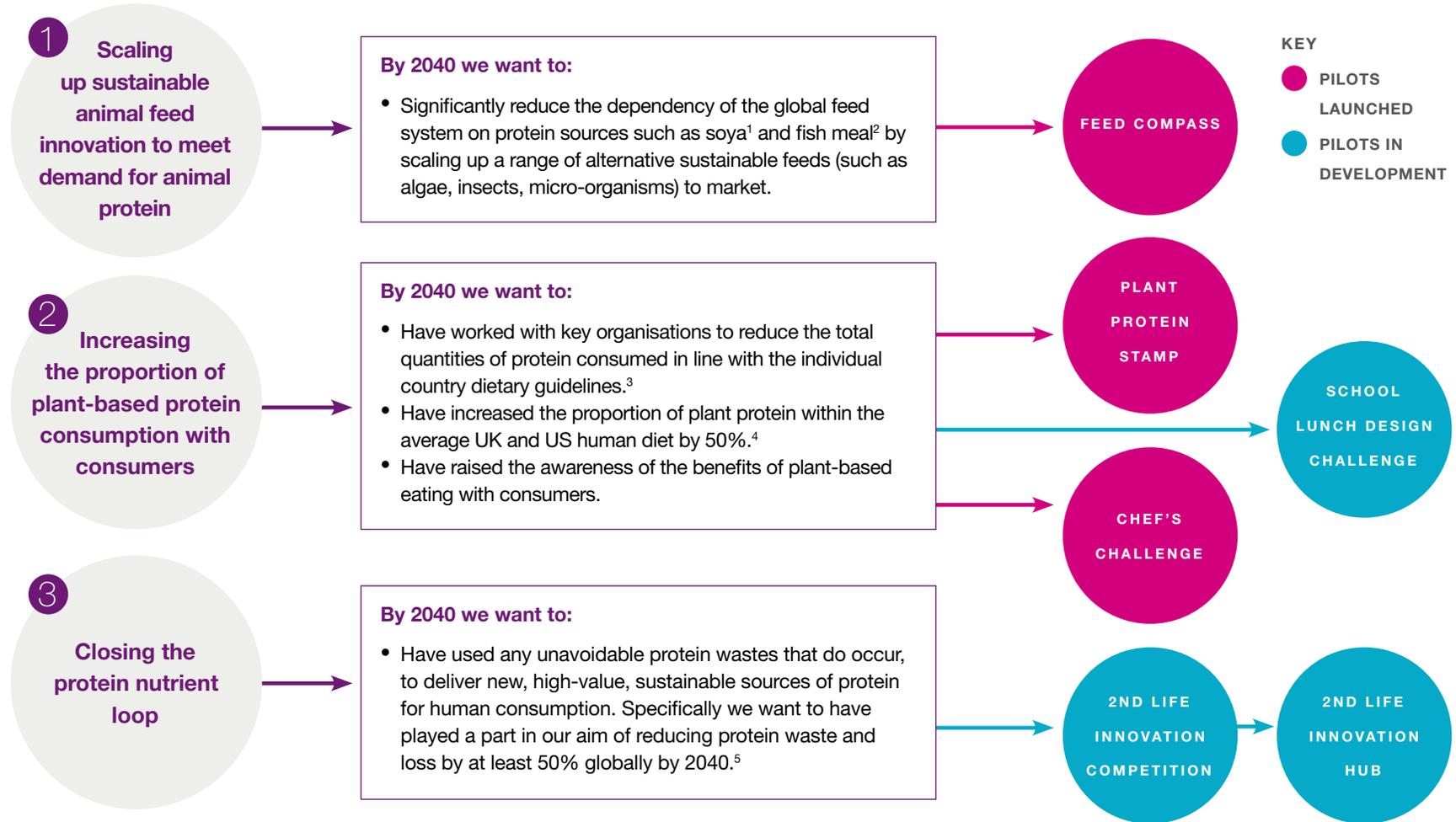


Catalysed action and increased investment in sustainable solutions, and influenced policy that address key hotspots across the system.



## Driving **action**

We're focussing on three innovation areas for immediate action to help us achieve our 2040 goals. To accelerate progress, we have designed six pilot projects, featured in this report.



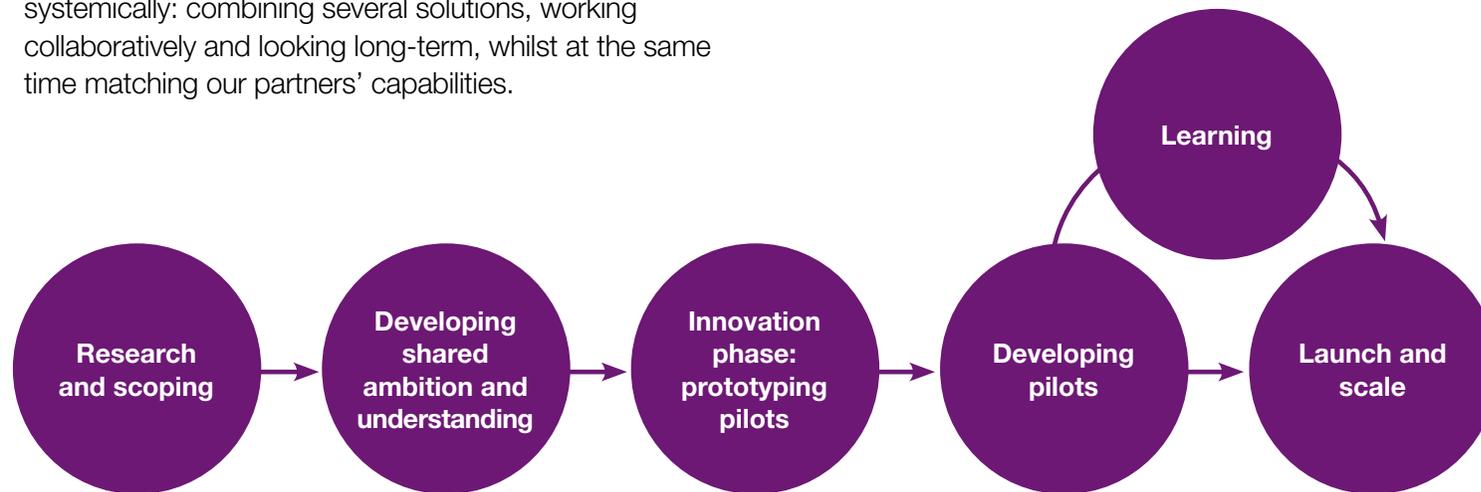
## Our **innovation process**

The innovation areas were prioritised as points in the system where change would have the greatest impact.

Having set out our ambition, we investigated the barriers to progress and ran innovation processes with over 250 stakeholders to find the most creative and powerful solutions.

The final projects are designed to address these barriers systemically: combining several solutions, working collaboratively and looking long-term, whilst at the same time matching our partners' capabilities.

**We are now launching these pilot projects, enabling learning on the journey to scalable solutions that will shift the whole protein system.**



## What's shaping **change**?

This is a dynamic and fast-moving agenda, and we're not alone in our drive for action. Some key trends highlight that change is coming:



### **Governments advocate change through dietary guidelines away from meat protein.**

China has committed to halving its meat consumption by 2050.<sup>6</sup> The Netherlands now recommends that people eat no more than 500g of meat per week,<sup>7</sup> and updated UK guidelines recommend that beans and pulses are consumed alongside meat and fish for protein.<sup>8</sup>



### **Investors focus on protein to lessen risks.**

The FAIRR Initiative has brought together a \$1.25 trillion coalition of 40 investors urging global food businesses to develop strategies for diversifying investments into alternative and plant-based proteins, to mitigate the risks posed by animal production.<sup>9</sup>



### **The conscious consumer and the rise of the flexitarian.**

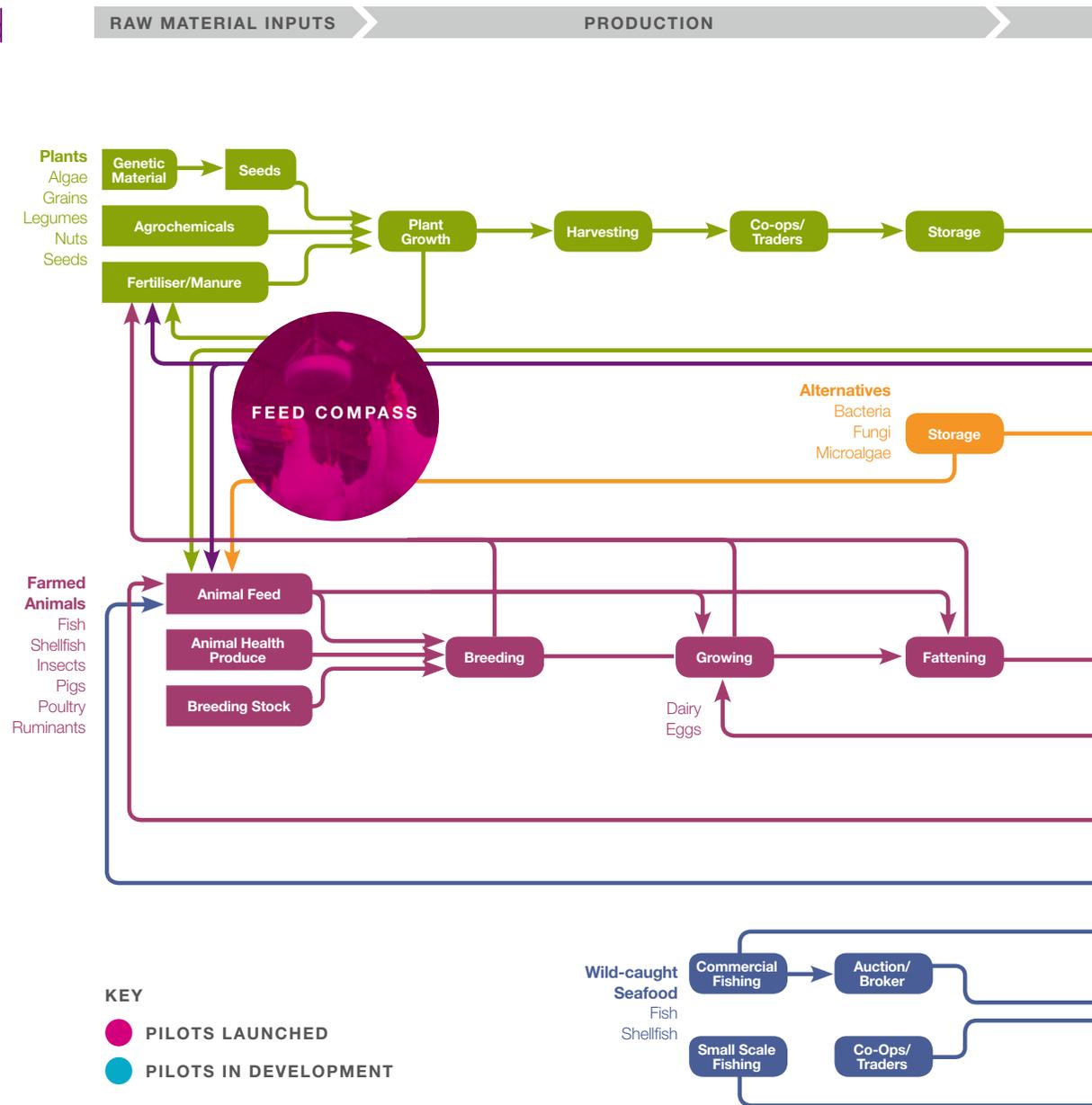
A third of people in Europe now identify as 'semi-vegetarian'. These flexitarians choose to eat meat less often and focus more heavily on plant-based diets. With their number set to rise by 10% in 2017, there is a rising awareness of the health and environmental benefits of a diet that is richer in plants and includes less meat.<sup>10</sup> In the US, 42% of people know more about plant-based diets than five years ago and 63% have tried plant-based alternatives.<sup>11</sup>

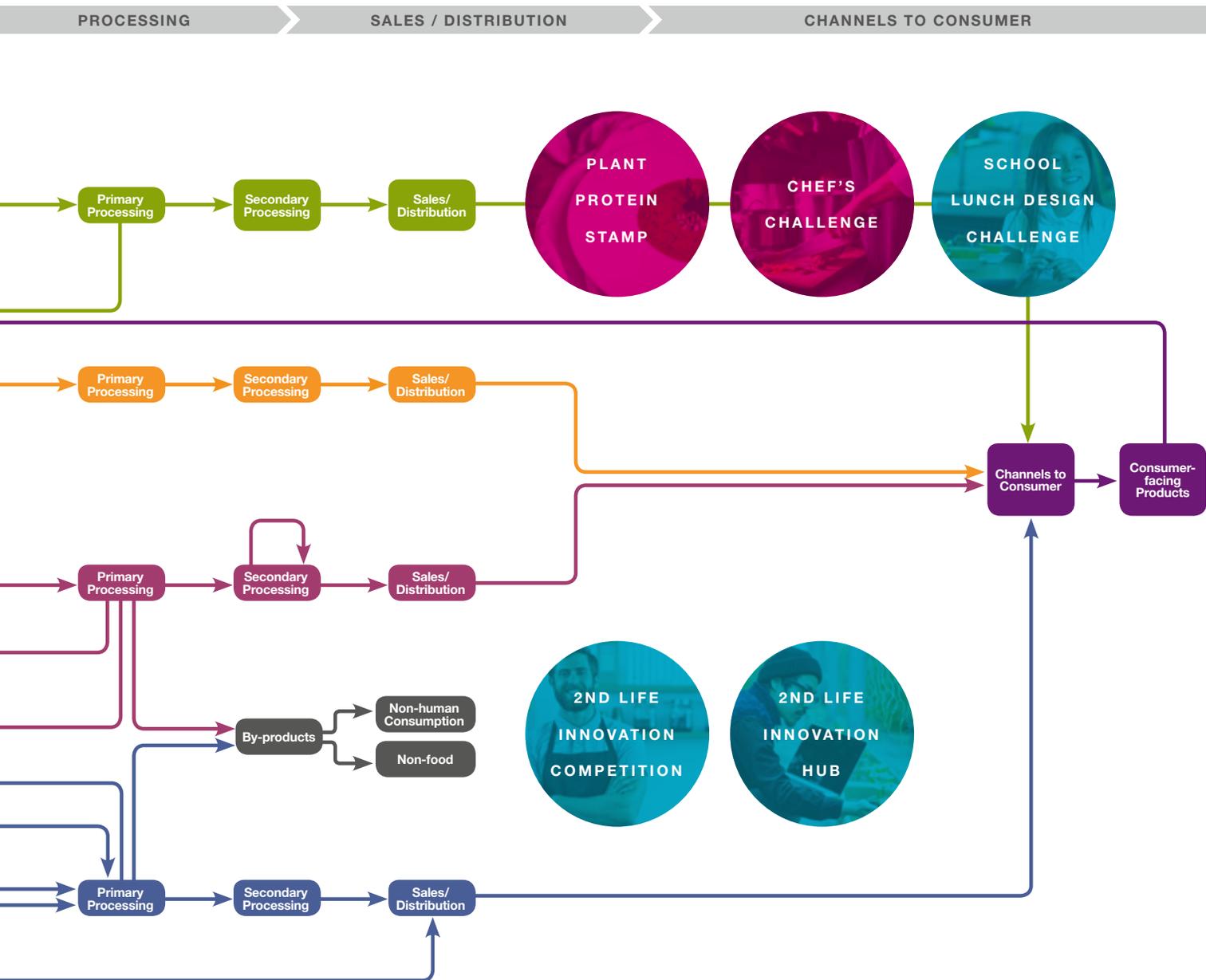
## A **systemic view** is needed

We recognise that interventions and solutions are required across the protein system – from field or farm to plate – to change the way we produce, consume and value protein, both today and in the future.

Work has already started, and our projects aim to accelerate this. The innovation phase in 2016 identified six high-impact pilot projects, three of which have been prioritised for immediate action.

**We are actively seeking partners and funders to help lead and scale all six projects.**





Signal of change

**New VC funds for plant and alternative proteins**

Last year saw significant investments designed to support plant and alternative protein start-ups. The CQ Green Protein Fund is the first VC fund to focus on sustainable protein,<sup>12</sup> and Powerplant Ventures closed a \$42 million fund to back 'plant-centric' food.<sup>13</sup> New Crop Capital is a US venture fund investing in companies replacing foods from traditional animal agriculture.<sup>14</sup>

Direct investments include Archer Daniels Midland Company's controlling stake in Harvest Innovations<sup>15</sup> and Exo, the insect protein bar start-up receiving \$4 million from AccelFoods.<sup>16</sup>

INNOVATION AREA

Scaling up  
**sustainable animal  
feed innovation**  
to meet demand for  
animal protein



Over the last 60 years, farmed animals have increasingly been fed on grains, soy and fishmeal, causing serious environmental challenges and using high quality sources of protein that could be feeding humans directly.

Sustainable feed solutions include by-products, insects, microalgae, seaweed, fungi, and methane-fed bacteria. In-depth research across the feed industry highlighted the following key barriers to scaling these sustainable feed options:



PILOT PROJECT 1

# Feed Compass



## Feed Compass

We want to increase transparency and build demand for animal feed that optimises environmental, social and economic outcomes.

### HOW?

We are developing a framework that captures the key criteria that make a feed sustainable, including environmental, economic and social considerations. We will then build an easy-to-use tool that uses the framework to assess the sustainability credentials of different animal feeds.

Upon development, we will invest in communications to gain credibility and promote take-up of the tool amongst key industries.

We want the assessment framework to be used as a communication and decision-making tool for a broader set of stakeholders, such as investors, feed manufacturers, policy-makers, retailers and consumers.

“ We believe that the growing demand for animal-based food can only be met using **feed produced sustainably**. To deliver this, alternative proteins in feed must be widely used. Feed Compass is critical for reaching a shared vision of feed fit for the future. ”

**DR. THOMAS KAUFMANN** SVP SUSTAINABILITY DEVELOPMENT NUTRITION, EVONIK NUTRITION & CARE GmbH

### By the end of 2018 we will have:

- Developed a collaborative framework and tool alongside key industry influencers.
- Gained recognition from key stakeholders in the food industry (e.g. retailers, food companies, animal protein producers and feed companies) for the framework.



### Signal of change

#### Laying the foundations of alternative proteins for animal feed

Calysta opened a new plant in the UK in 2016 to develop its new sustainable fish feed protein ingredient. FishKind™ offers a new alternative to fishmeal, lowering the footprint of the fishing industry.

Ynsect, a European pioneer for sustainable animal feed, is building its first large-scale factory in France to scale up production of its insect protein.

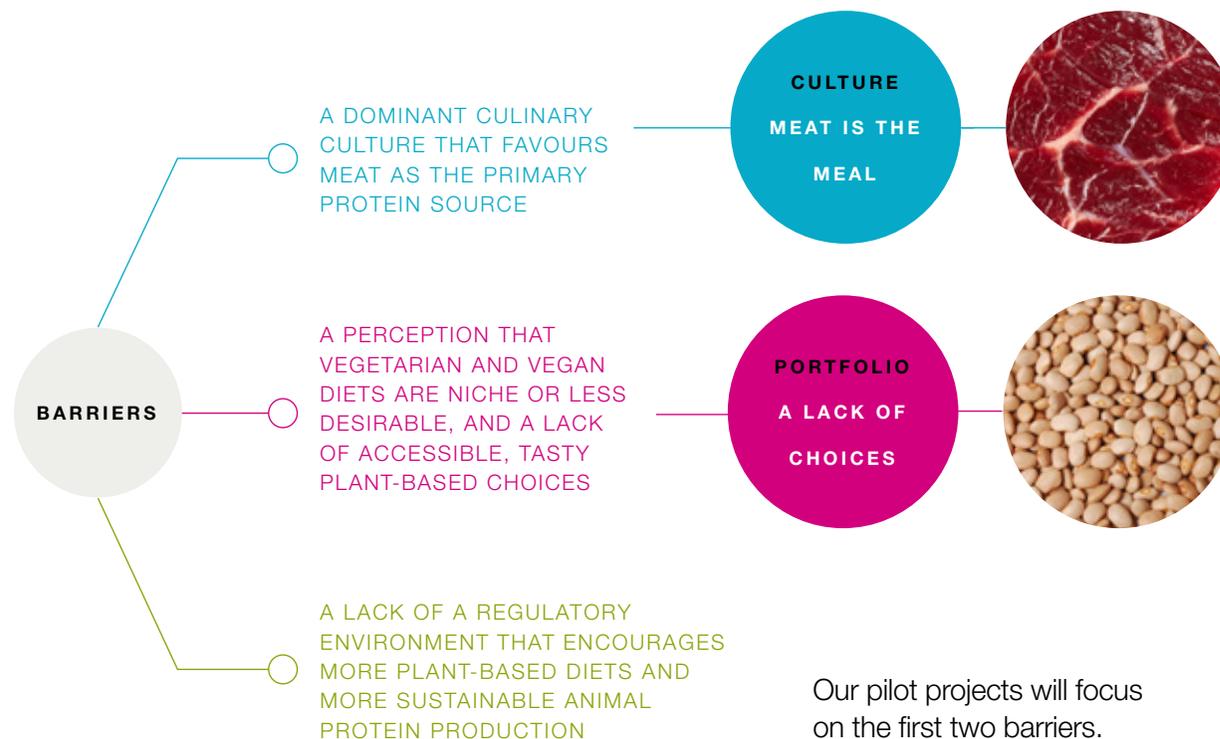
INNOVATION AREA

Increasing the proportion  
of **plant-based protein**  
consumption with consumers



In the developed world we consume more protein than needed, most of it animal. Estimates suggest Western diets need to reduce meat consumption by half to be within planetary boundaries.

Our research identified three primary barriers to plant-based protein consumption in developed markets:



Our pilot projects will focus on the first two barriers.



### Signal of change

#### New groups formed to drive plant-based eating

New alliances and associations are being formed to support the growth of plant-based protein, including The Green Protein Alliance in the Netherlands, The Plant Based Foods Association in the US and the World Resources Institute's Better Buying Lab.

PILOT PROJECT 2

# Chef's Challenge



## Chef's Challenge

We want to encourage people to increase their consumption of plants and grow the availability of tasty plant-based meals.

### HOW?

We are recruiting leading chefs in the UK, who are influencers of food trends, and who have a direct impact through providing in-demand food to consumers.

Their involvement will drive a peer-to-peer communications strategy, with chefs leading the conversation with other chefs, influencing food caterers to increase their tasty plant-based meal options.

The campaign will also harness the international profile of some of these chefs and we will develop approaches which can be tailored to different global contexts in the future.

“Every day we reach thousands of people through the food service venues we operate across the UK; a great chance to **communicate the importance of sustainable diets**. In particular, the opportunities for more plant-based protein options, vital to reducing environmental impact whilst supporting health, social and commercial needs.”

**MIKE HANSON** HEAD OF SUSTAINABLE BUSINESS, BAXTER STOREY

### By the end of 2018 we will have:

- Curated a portfolio of plant-based recipes and techniques from influential chefs.
- Supported influential food catering businesses to trial successful plant-led dishes that are rolled out across their businesses.
- Supported the development of the curriculum to create transformation in a leading culinary college.



### Signal of change

#### Pret goes green

After trialling as a pop-up in London's Soho, high street chain Pret a Manger has decided to make its all-vegetarian and vegan shop permanent.

Despite expecting sales in Veggie Pret to drop 30%, after two weeks, they were 70% up on the previous year.<sup>17</sup> Pret is now looking to replicate this success with a recently-opened second London branch in Shoreditch, before launching a new veggie range in all their US shops.<sup>18</sup>

PILOT PROJECT 3

# Plant Protein Stamp



## Plant Protein Stamp

We want to help people easily identify and choose more plant-based protein options, so that they see them as a viable or even preferred alternative.

### HOW?

We will create a nationally recognised on-pack plant protein label in the US, indicating the amount of protein in consumer packaged goods.

After testing the criteria and the branding of the stamp, and once an initial group of food manufacturers are using it on packaging, it will be launched with a consumer communications campaign.

A third-party organisation will be enlisted to administer the stamp in the long term, to continue to influence consumer choices.

“ Providing consumers with an **easy-to-understand, trustworthy indicator** of a good source of plant-based protein stands to make shopping easier and lead to more diverse, great-tasting diets. ”

**LISA BOYD** DIRECTOR, WELLNESS STRATEGY, TARGET

### By the end of 2018 we will have:

- Recognition of the stamp amongst key stakeholders.
- The stamp launched, and a consumer campaign activated.
- The stamp featuring on a range of consumer packaged goods.
- Raised profile and increased recognition of the health benefits of plant-based eating in the US.



### Signal of change

#### New plant-based alternative products are launched

In 2016, Impossible Foods and Beyond Meat both launched plant-based burgers that aim to replicate the look and taste of meat. Boosting the range of dairy alternatives, Ripple Foods launched a plant-based milk from pea protein that contains more protein than other non-dairy alternatives like almond or coconut milk.

PILOT PROJECT 4

# School Lunch

## Design Challenge



## School Lunch Design Challenge

We want to influence childhood food preference by getting more plant-based protein meal options into the US school lunch program.

### HOW?

We plan to engage school administrators and lunch directors, who are responsible for menu creation and food purchasing.

By introducing a range of current options available from food company providers, we will raise their awareness of the availability and accessibility of plant-based food.

This work will help us provide a stronger business case to food business providers for developing plant-based menu options.



### Signal of change

#### Big Meat gets into plants

US meat giant Tyson Foods has invested in plant-based meat alternative start-up Beyond Foods.<sup>19</sup>

This could signal greater collaboration between traditional animal protein companies and innovative alternatives, to give the consumer wider choice.

### By the end of 2018 we will have:

- Launched a design challenge focussed on plant-based protein options for school lunches that meet USDA requirements.<sup>20</sup>
- Created a strong portfolio of cost-effective plant-based protein foods for school lunches.
- Created a number of new options for school lunches by food companies.
- Increased demand for plant-based proteins as part of school lunches.



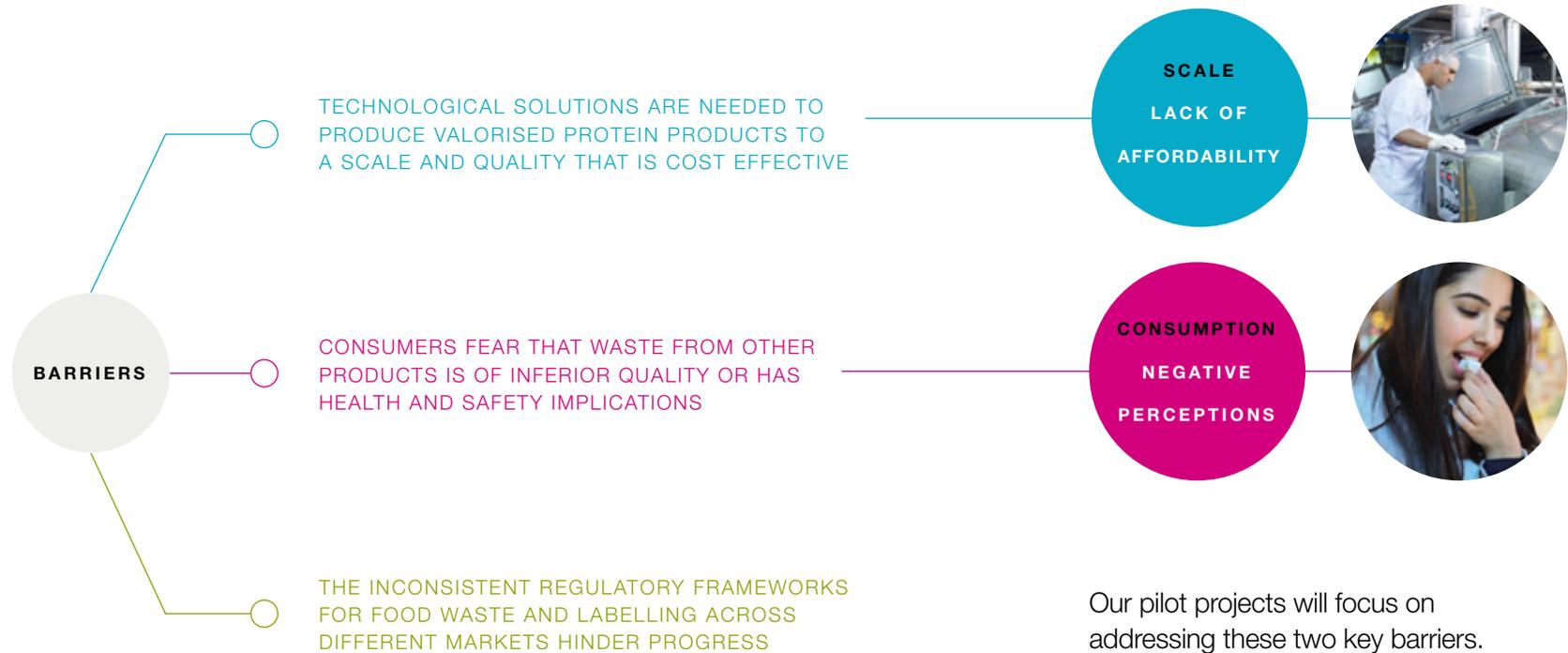
INNOVATION AREA

# Closing the protein nutrient loop



Approximately 30% of all food grown globally is wasted. Protein waste makes up a significant proportion of these losses. As a precious resource, avoiding protein waste and loss and then capturing these valuable nutrients to feed humans is the focus of our work.

Our research identified three barriers to valorising protein for human consumption.<sup>21</sup>



## PILOT PROJECT 5

# Second Life Protein Innovation Competition

We want to encourage the development of new valorised protein food products at a scale and quantity that is both cost effective and attractive for retailers and consumers.<sup>21</sup>

### HOW?

We want to launch a competition which offers a fund, in-kind support and an associated communications package to develop a new valorised protein product (or potentially a new business model that is successfully launched within the marketplace).

The focus of the competition will be how a specific product – using second life proteins – can be successfully commercialised.

We will then use the competition and fund to build case studies demonstrating how food waste can be transformed into nutritious foods for humans, to share and apply lessons more widely.

#### By the end of 2018 we will have:

- Successfully run the competition, where the winning team is in progress to launch to market.
- Demonstrated that food loss can be used to feed humans, and raised the profile of valorised protein products amongst consumers.
- Helped a retailer create a successful market/brand proposition around a valorised protein product.
- Developed a powerful set of communications messages plus recommendations to tackle negative consumer perceptions.



## PILOT PROJECT 6

# Second Life **Protein Innovation Hub**

We want to address some of the challenges associated with investment in technological, social, process or economic solutions, so we can produce high-quality, healthy and nutritious valorised protein products for humans, at scale.<sup>21</sup>

### HOW?

We plan to establish a European online innovation hub that will bring together stakeholders working on protein valorisation solutions.

This innovation hub would facilitate knowledge exchange, build an easy-to-access evidence base around the benefits of protein valorisation and develop a number of case studies which demonstrate a clear return on investment.

### By the end of 2018 we will have:

- Designed and launched the innovation hub. This will include a toolbox of key resources for innovators, investors and businesses working in this space.
- Engaged with and gained support from retailers and food manufacturers with a commitment to drive innovation and product development.



## Our **collaborators**

The Protein Challenge is led by a dynamic partnership of forward-thinking organisations including Ahold Delhaize, Evonik, Firmenich, Hershey, Quorn, Seeding the Future, Target, Volac, Waitrose and WWF.

This leadership group has been joined by other leading organisations who have committed resources, their best expertise and commitment to driving forward the pilot projects, including Alpro, Baxter Storey, Calysta, General Mills, Impossible Foods, Nestlé Research, Pret a Manger and TerraVia.

**We are looking for more organisations who can bring resources, expertise and influence to drive forward innovation and action across the protein system.**



## The **Futures Centre**

We established a project hub for the Protein Challenge 2040 on Forum for the Future's Futures Centre platform to track trends, innovation and signals of change in protein production and consumption, and to build a community of stakeholders ranging from food and agriculture experts to innovators interested in the solutions.

Visit the 'Future of Protein' project hub to join the conversation, and sign up to our newsletter to stay up to date on the latest innovations.

[www.thefuturescentre.org/project-hub/7252/protein-challenge-2040](http://www.thefuturescentre.org/project-hub/7252/protein-challenge-2040)



Signal of change

### Cellular agriculture gains ground

New Harvest, the non-profit that funded the development of the world's first cultured beef burger, led the first global cellular agriculture conference in San Francisco in 2016.

Start-ups including Memphis Meats and MosaMeats have attracted significant investment to engineer molecularly identical meat and dairy products in the lab.<sup>22</sup>

## Join US

We are looking for more ambitious and pioneering collaborators to help us accelerate the change to a sustainable protein system, through the development and practical delivery of our exciting pilot projects.

### WHY GET INVOLVED?

#### Knowledge & Innovation

Bringing in knowledge and insights from outside your organisation, to inform business strategy and innovation for future commercial opportunity.

#### Leadership & Influence

A chance to demonstrate leadership and innovation, whilst influencing the growing dialogue on the protein system.

#### Relationships & Collaboration

Opportunities for new or greater collaboration amongst customers, suppliers or new initiatives, and to extend stakeholder dialogue.

#### Sustainable Development Goals

Helping your business deliver against its goals and ambitions under the SDG process.

“ Ahold Delhaize recognises sustainable protein as an important theme across many dimensions: from healthier eating to animal welfare to climate impact. The debate on sustainable protein affects many of our stakeholders across different geographies. Ahold Delhaize joined the Protein Challenge 2040 to engage in pre-competitive collaboration on the **global challenge** of sustainable protein. Ultimately, our goal is to **collaborate** across the chain, **drive** innovation and help our customers make **better choices** both for their health and for the environment. ”

**MEGAN HELLSTEDT** VP SUSTAINABLE RETAILING,  
AHOLD DELHAIZE

**To be part of this ground-breaking international collaboration, contact Simon Billing**  
[s.billing@forumforthefuture.org](mailto:s.billing@forumforthefuture.org)

## About Forum for the Future

We are an international non-profit working with business, government and civil society to solve complex sustainability challenges.

Like the members of The Protein Challenge 2040 consortium, Forum believes it is critical to transform the key systems we rely on to shape a brighter future and innovate for long-term success. We have a track record of over 20 years of working with pioneering partners in one-to-one partnerships, and also as part of multi-stakeholder collaborations to address system-wide challenges.

Forum's Protein Challenge 2040 team is led by Principal Sustainability Advisor Simon Billing, and includes Sarah Tulej, Mark Driscoll, Stephanie Draper, Kat Campbell, Alisha Bhagat and Jacqueline Culleton. The production of this report was led by Alison Silk.

Find out more at [forumforthefuture.org](http://forumforthefuture.org)



## With thanks

We would like to thank everyone who has generously taken the time to join us on this journey and contribute to the development of our pilot projects by sharing their expertise and knowledge.

### Leadership Group

#### Ahold Delhaize

Karin Bogaers, Director Product Sustainability & Innovation

#### Evonik

Thomas Kaufmann, SVP Sustainability Development Nutrition

#### Firmenich

Birgit Schleifenbaum, Director Discovery Natural & Sustainable, Innovation, Flavors

#### Hershey's

Steve Hess, Director, Snacks and Refreshment Technology

#### Quorn

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Peter Harrison, Marketing Director

#### Seeding the Future

Bernhard van Lengerich, Founder & CEO

#### Target

Lisa Boyd, Director, Wellness Strategy

#### Volac

Andy Richardson, Head of Corporate Affairs

#### Waitrose

Moira Howie, Manager, Nutrition & Health

#### WWF

Duncan Williamson, Food Policy Manager

### Acknowledgements

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Mike Velings

#### Baxter Storey

Mike Hanson

Gabriella Roberts

#### BBSRC

Sian Rowland

#### Behaviour Change

Rob Moore

#### Beyond Meat

Ethan Brown

#### Biopower Technologies

#### Limited

Phil Metcalf

#### Biorenewables

#### Development Centre

Helen Shiels

Joe Bennett

Mark Gronnow

#### BioVale Ltd

Maggie Smallwood

#### Blonk Consultants

Hans Blonk

#### Bühler

Andreas Baumann

Anna Kreis

Peter Böhn

#### Business Inspired Growth

Gesa Reiss

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Lukas Hoex

#### Eating Better

Sue Dibb

#### Eimlea

Paul Hart

#### Entocycle

Kieron Whitaker

#### ETANTE

Julian Walker-Palin

#### Evonik

Michael Binder

#### Fat Duck

Jonny Lake

#### FEFAC

Nicolas Martin

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Dattatreya Banavara

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Mark Smith

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#### Global Pulse

#### Confederation

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#### Hubbub

Gavin Ellis

Tessa Tricks

#### Humane Society

Claudia Tarry

Kristie Middleton

#### Impossible Foods

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#### Ingredion

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Nick Cliffe

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#### Ripple Foods

Adam Lowry

#### Samworth Brothers

Mark Shippey

#### Seven Generations Ahead

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#### ShareAction

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Clare Richards

#### Sodexo

Edwina Hughes

Wan Mak

#### Sustainable Restaurant

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#### Target

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Lisa Linnell

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Luke Townsend

Howard Wright

#### Tesco

Jonathan Gorman

Laurence Webb

#### Thinkstep

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#### Upton Naturals

Nicole Sopko

#### Volac

John Newbold

Suzane Leser

#### Wageningen University

Theun Vellinga

Imke de Boer

#### Waitrose

Riyaz Dhalla

#### Welsh Assembly Government

Adrian Jones

#### Westminster Kingsway

#### College

Paul Jervis

#### World Resources Institute

Daniel Vennard

#### Woven Network

Nick Rousseau

#### WRAP

Nina Sweet

Mike Falconer Hall

Ruta Dauksaite

Andrew Pary

Bojana Bajzelj

#### WWF

Brigitte Alarcon

Piers Hart

Marcella Navarro

Kate Wolfenden

#### WWF US

Sandra Vijn

Carlos Siavanni

#### Ynsect

Antoine Hubert

Benjamin Armenjon

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21. Valorisation is defined as capturing waste and loss (in this case across the protein system from field to plate) and turning it into a product which has a commercial and financial value. Regrained is an example of a second life protein or a valorised product. Using spent grain from the brewing industry, Regrained has turned a potential waste into a snack bar and branded this Eat Beer.
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