

Food and Agriculture Roadmap Chapter: Healthy and Sustainable Diets



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① Executive summary



① Executive summary

BACKGROUND

Food plays vital health, economic and cultural roles in every society. However, today's food systems are outstripping the resources of the planet, while evolving diets are resulting in global health crises of both over- and undernutrition. COVID-19 has exacerbated the situation and underscored the need to urgently build better, more equitable and more resilient food systems capable of reducing and absorbing major food value chain disruptions. COVID-19 has compelled all food value chain stakeholders to act urgently in a transformative and coordinated way to deliver healthy diets for all, produced sustainably within planetary boundaries.

PURPOSE

The Food and Agriculture Roadmap serves as the implementation plan for [WBCSD's CEO Guide to Food System Transformation](#). It builds on the body of work developed by WBCSD's [Food Reform for Sustainability and Health \(FRéSH\)](#), [Scaling Positive](#)

[Agriculture \(SPA\)](#) and [Global Agribusiness Alliance \(GAA\)](#) projects.

The Roadmap sets out transformational targets, key action areas and solutions urgently required to transform food systems to achieve environmental sustainability, equitable livelihoods, and healthy and sustainable diets for all.

Grounded in scientific and economic analysis, the Roadmap helps companies prioritize and develop business-led solutions while advancing supportive policy, regulatory and financial frameworks.

Developed primarily for use by executive management and sustainability and nutrition experts in companies throughout the food and agricultural system, the Roadmap is also relevant for other stakeholders whose actions and collaboration with the private sector play a critical role in transforming food and agriculture systems – such as governments, investors,

civil society and the research community.

FOOD AND AGRICULTURE ROADMAP: CHAPTERS

The Food and Agriculture Roadmap comprises the following chapters, each providing implementation guidance to businesses for the transformation pathways outlined in WBCSD's CEO Guide to Food System Transformation.

It is important to note that it is necessary to scale the action areas and solutions proposed in the various chapters of the Roadmap together as they all depend upon and reinforce each other. All of them require action from the business community – from fork to farm – as well as from national governments, the financial sector, civil society – including academia – and the international community.

FOOD AND AGRICULTURE ROADMAP CHAPTERS



Healthy and Sustainable Diets
(including food waste)



Agricultural Transformation



Equitable Rural Livelihoods
(including food loss)



Policy

FOOD AND AGRICULTURE ROADMAP CHAPTER: HEALTHY AND SUSTAINABLE DIETS

The Healthy and Sustainable Diets chapter of the Roadmap puts forward a set of transformational targets, action areas and solutions primarily aimed at the food and agriculture sector to provide healthy, accessible, enjoyable food for all, produced in a socially responsible manner within planetary boundaries.

We have clustered the transformational targets in two categories: nutrition and food waste. Due to a lack of internationally-agreed nutritional targets, this document proposes a set of new transformational targets drawn from the most relevant existing scientific and sector-specific literature – produced by EAT-Lancet, the Food and Land Use (FOLU)

Coalition, the Food, Agriculture, Biodiversity, Land-Use, and Energy (FABLE) Consortium, the World Health Organization and the Food and Agriculture Organization of the United Nations (WHO-FAO), the World Resources Institute (WRI), WBCSD and the United Nations. All publications are consistent in that they highlight the need for a drastic global change in people’s diets to feed the growing population sustainably and nutritiously while achieving transformative change in the entire food system.



DIETARY AND NUTRITIONAL TRANSFORMATIONAL TARGETS

- The first transformational target sets out the boundaries for the daily consumption of 13 specific food types needed for a healthy and sustainable diet by 2050. We have selected these specific food types based on their importance to the human diet and their environmental impacts.^{1,2,3} We have drawn them from a wide range of scientific and sector-specific literature.

We have used upper and lower boundaries to help account for variations in diets due to geography, culture, demography and dietary habits. We have also mapped the targets against the consumption patterns of different regions to help understand the magnitude of change required to achieve healthy and sustainable diets globally.

Table 1: Transformational Target by 2050

FOOD TYPE	TRANSFORMATIONAL TARGET BY 2050 (G/DAY.PERS)	
	LOWER BOUNDARY	UPPER BOUNDARY
Whole grains	100	232
Vegetables	200	600
Fruits	100	300
Milk*	0	520
Beef, lamb and pork	0	27
Chicken and poultry	0	58
Eggs	0	25
Fish	0	100
Legumes	0	100
Nuts	0	75
Added fats	20	82
Sugar**	0	50
Sodium	1	2

* The lower boundary uses the definition of the EAT-Lancet Report, which refers to “whole milk or derivative equivalent”. The upper boundary uses the definition from Afshin et al. (2019) which refers to “milk including non-fat, low-fat, and full-fat milk”.

** We use the definition of the WHO, whereby sugar refers to “all sugars added to foods or drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates”.

- The second transformational target sets out the boundaries for the daily consumption of the 13 specific food types needed for a healthy and sustainable diet by 2030.

Given where the sector is today, business must achieve, by 2030, at least 30% of the change required to meet the 2050 transformational target for daily consumption of specific food types. This is the strict minimum to achieve the 2050 goal, as demand for food will continue to increase in line with population growth while its production will take place within increasingly more challenging planetary boundaries. We must act quickly and not delay critical actions to later decades.

FOOD WASTE TRANSFORMATIONAL TARGET

The third transformational target is to halve food waste by 2030, in line with the Sustainable Development Goal (SDG) 12.3. This offers a “triple win”: food waste reductions can save money for companies and households; wasting less means feeding more; and food waste reductions alleviate pressure on the environment – particularly relating to climate change and natural resources.

CALL TO ACTION

The need to act urgently to transform our food systems is clear. Businesses can either lead the change now to achieve the SDGs and the Paris Climate Agreement or let the world fail.

This Roadmap outlines the critical business-led solutions that companies need to implement

to reach key transformational targets by 2030 and 2050 to deliver healthy and sustainable diets to all, produced in a socially responsible manner within planetary boundaries.

The breadth of solutions identified here highlights the scale of change required and the need for companies to take action both individually and collectively.

To implement these solutions, FReSH and its member companies will continue to work together to:

- Advance individual business-led solutions identified within the Roadmap;
- Catalyze collaboration across the food and agriculture value chain and beyond, along the collective solutions identified in the Roadmap; and
- Enhance dialogue and encourage the development of supportive actions and frameworks by other stakeholder groups, including investors and policy-makers.

Table 2: Action areas to achieve food system transformation

	ACTION AREA	SUB-ACTION AREA
1	Adjust menus, product portfolio mixes and product formulations to improve nutrition and sustainability and reduce food waste	Improve the nutrition and environmental profile of food products, meals and offerings
		Innovate in food processing and supply chain management
2	Increase the share, diversity and sustainability of plant-based foods	Increase the proportion of plant-based foods in food products, meals, and offerings
		Work with other actors within and outside of the value chain to increase the consumption of healthy and sustainable plant-based foods
3	Increase protein diversity and sustainability performance	Improve the sustainability performance of animal-based proteins
		Expand healthy and sustainable alternatives to animal protein sources
4	Support consumers to choose and access healthy and sustainable food and reduce food waste	Shape consumer awareness and demand for healthy and sustainable food
		Change consumer-facing business and consumer behavior to reduce food waste

② Context



② Context

THE NEED FOR FOOD SYSTEM TRANSFORMATION

The food system includes everything involved in feeding people and animals, from growing and harvesting to processing, trading, marketing, distribution, consumption and disposal.⁴ Current food systems are fragmented and unsustainable. Major scientific and economic reports (such as the Climate Change and Land report;⁵ the Global Assessment report on Biodiversity and Ecosystem Services;⁶ the Growing Better report;⁷ the State of Food Security and Nutrition in the World report;⁸ and the EAT-Lancet article on "Food in the Anthropocene"²) are all sounding a clear alarm on the urgent need to act today; we have also released several summaries on these

reports for business that can be found in WBCSD's [Business Summary Library](#). Moreover, public opinion and consumer demand are both increasing pressure on and creating opportunities for businesses.

The global food system has expanded significantly, growing to meet the needs of increasing populations around the world, which experts expect to exceed 9 billion by 2050.⁹ However, some old challenges remain and new ones have appeared. Current diets are resulting in global health crises of both over- and undernutrition. Globally, 1 in 9 people are hungry or undernourished, and the number of people affected by hunger will surpass 840 million by 2030.⁸ In addition, 1 in 3 people are overweight or obese.¹⁰

Humans are stripping the planet's natural resources at an unprecedented rate, leading to the loss of natural systems, soil erosion and freshwater scarcity. Emissions from the global food and agriculture system are estimated to be up to 37% of total net anthropogenic greenhouse gas emissions.⁵ The impacts of climate change are already being felt across agricultural systems, as increases in average temperature and extreme weather events have caused disruption and losses.¹¹ Food loss and waste, across the whole value chain, is significant. Approximately one third of all food is lost or wasted between the farm and the fork, generating 8% of global greenhouse gas emissions and resulting in USD \$940 billion in economic losses globally each year.¹²



COVID-19 PANDEMIC

The COVID-19 pandemic has exacerbated the existing weaknesses of the global food and agriculture system. It has highlighted a wide range of systemic issues, ranging from unequal access to food and nutrition to poor working conditions, food loss and waste, as well as the destruction of nature by non-sustainable agricultural practices and the increase of zoonotic diseases transmitted from animals to humans.^{13,14,15} As a result of the pandemic, the challenges that food systems are already experiencing are growing deeper, making the need for food system transformation even more urgent. A dramatic illustration of this is the fact that experts expect the addition of 83 to 132 million people to the total of those undernourished worldwide in 2020 compared to 2019.⁸

ROLE OF THE PRIVATE SECTOR

The private sector is responsible for the production and sale of almost all the food consumed globally. Therefore, businesses have a central role to play in improving food production and consumption patterns worldwide. Some recent signals of change are offering food value chain companies a unique opportunity for action to transform the food system and bring about multiple co-benefits for climate, biodiversity and health. As hunger increases and governments deploy stimulus packages around the world to mitigate the economic consequences of the COVID-19 pandemic, society is looking to the private sector to redesign and accelerate solutions to deliver a more resilient system that provides healthy and sustainable diets for all.



3 Introduction



③ Introduction

PURPOSE OF THE ROADMAP: FROM TRANSFORMATION PATHWAYS TO ACTION AREAS AND SOLUTIONS

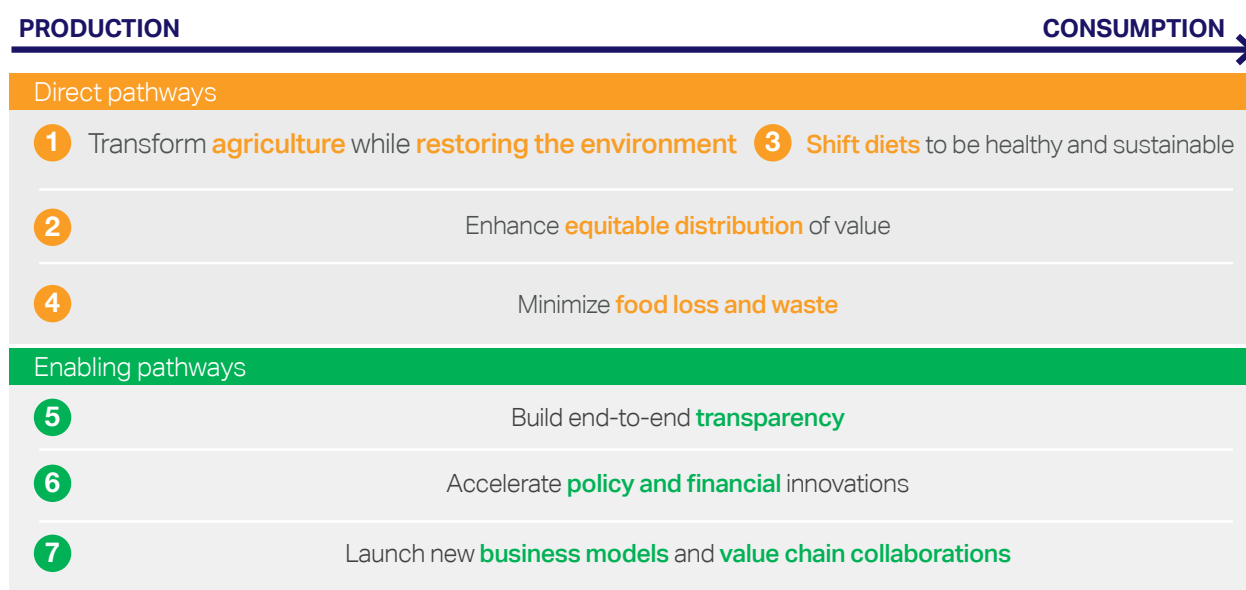
The Food and Agriculture Roadmap serves as the implementation plan for [WBCSD's CEO Guide to Food System Transformation](#) by setting out the overarching transformational targets, key action areas and business-led solutions required to achieve environmental

sustainability, equitable livelihoods, and healthy and sustainable diets for all. It builds on the body of work developed by WBCSD's [Food Reform for Sustainability and Health \(FReSH\)](#), [Scaling Positive Agriculture \(SPA\)](#) and [Global Agribusiness Alliance \(GAA\)](#) projects.

The Roadmap calls on companies to work actively to address the issues of healthy and environmentally sustainable

production and consumption by delivering integrated solutions to transform food systems. Achieving food system transformation will also require the development of supportive policy, regulatory and financial frameworks (see section below on the importance of collective action).

Figure 1: Seven pathways where business can lead to accelerate transformation



FOOD AND AGRICULTURE ROADMAP: CHAPTERS

WBCSD's Food and Agriculture Roadmap builds upon the CEO Guide's pathways in a series of chapters, each corresponding to one of the direct pathways identified in the Guide.

Food loss and waste are covered in the chapters on Healthy and Sustainable Diets (food waste) and Equitable Rural Livelihoods (food loss).

It is necessary to scale the action areas and solutions put forward in the various chapters together because each depends upon and reinforces the others. All of them require action from national governments, business, the financial sector, civil society – including academia – and the international community.

ROADMAP CHAPTER ON HEALTHY AND SUSTAINABLE DIETS

The Healthy and Sustainable Diets chapter of the Roadmap focusses on the consumption part of the food value chain, providing guidance on business-led solutions to enable and achieve healthy and sustainable diets.

It puts forward three overarching, high-level, timebound transformational targets and outlines concrete actions for companies to provide consumers with access to healthy and sustainable foods, while supporting better consumption choices.

APPROACH

We have developed the Food and Agriculture Roadmap through a rigorous and iterative research and consultative process including the following key steps:

Literature review – A desk review of existing research and analysis, including publications by EAT-Lancet, the Food and Land Use (FOLU) Coalition, the Food, Agriculture, Biodiversity, Land-Use, and Energy (FABLE) Consortium, the World Health Organization and Food and Agriculture Organization of the United Nations (WHO-FAO), and the World Resources Institute (WRI).

Company engagement – Semi-structured interviews, in-depth webinars and individual exchanges with WBCSD members from across the supply chain, first to establish and agree upon the key objectives of the Roadmap, then to agree on action areas and to prioritize solutions.

FOOD AND AGRICULTURE ROADMAP CHAPTERS



Healthy and Sustainable Diets
(including food waste)



Agricultural Transformation



Equitable Rural Livelihoods
(including food loss)



Policy

Key expert and stakeholder workshop – Consultation with key experts, scientists and other stakeholders to advise on appropriate literature and data to develop the Roadmap.

Webinar consultations – Multi stakeholder webinars with representatives from throughout the value chain, NGOs, researchers and academia to receive overall feedback on the Roadmap.

Science to Policy Dialogue – A series of dialogues that bring together business, civil society and academia to identify key policy issues, asks and recommendations linked to healthy and sustainable food systems. They gather the global consumer point of view and the related challenges of transforming agriculture while restoring the environment, food loss and waste, and landscape-based solutions.

Advisory Board review – Webinar consultation and individual follow-up exchanges with high-level strategic advisors from key international organizations specialized in nutrition and health, sustainability and behavior change.



④ Transformational targets to achieve healthy and sustainable diets



④ Transformational targets to achieve healthy and sustainable diets

Food system transformation requires a deep and fundamental shift, informed by a collective understanding of the current challenges, science-based targets and collective solution spaces for business action. Before considering the specific actions that food and agriculture players must take, we first identify sector-level targets to achieve food system transformation.

The transformational targets that we propose in this chapter fall within two categories: diet and nutrition, and food waste.

Due to a lack of internationally agreed targets on this topic, we propose a set of new dietary and nutritional transformational targets drawn from the most relevant existing scientific and sector-specific literature – produced by EAT-Lancet, the FOLU Coalition, the FABLE Consortium, WHO-FAO, WRI, WBCSD and the United Nations. Each publication highlights the role of sustainable and/or healthy diets in achieving transformative change in the food system and suggests that feeding the growing population sustainably and nutritiously requires drastic global change.

Companies should consider all targets and prioritize the ones that are applicable to the scope of their product portfolios, offerings and operations throughout the entire value chain.

DIET AND NUTRITION

Transformational target: Work towards the ranges of change required to meet sustainable, healthy diets based on the recommendations of several key publications by 2050, with global and regional ranges of change for intake of different foods as follows.¹⁶

Table 3: Overview of the transformational target for different food types

FOOD TYPE	TRANSFORMATIONAL TARGET BY 2050 (G/DAY.PERS)					
	Lower boundary	Source	Type*	Upper boundary	Source	Type*
Whole grains	100	Afshin et al. (2019)	N	232	EAT-Lancet	N&S
Vegetables	200	EAT- Lancet	N&S	600	EAT-Lancet	N&S
Fruits	100	EAT- Lancet	N&S	300	Afshin et al. (2019)	N
Milk**	0	EAT- Lancet	N&S	520	Afshin et al. (2019)	N
Beef, lamb and pork	0	EAT- Lancet	N&S	27	Afshin et al. (2019)	N
Chicken and poultry	0	EAT- Lancet	N&S	58	EAT-Lancet	N&S
Eggs	0	EAT- Lancet	N&S	25	EAT-Lancet	N&S
Fish	0	EAT- Lancet	N&S	100	EAT-Lancet	N&S
Legumes	0	EAT- Lancet	N&S	100	EAT-Lancet	N&S
Nuts	0	EAT- Lancet	N&S	75	EAT-Lancet	N&S
Sugar***	0	WHO	N	50	WHO	N
Sodium	1	Afshin et al. (2019)	N	2	FAO-WHO	N

Sources: Afshin et al. (2019);¹ EAT- Lancet;² FAO-WHO,³ WHO¹⁷

* N corresponds to publications including nutritional considerations; N&S corresponds to publications including nutritional and sustainability considerations.

** The lower boundary uses the definition of the EAT-Lancet Report, which refers to “whole milk or derivative equivalent”. The upper boundary uses the definition from Afshin et al. (2019) which refers to “milk including non-fat, low-fat, and full-fat milk”.

*** We use the definition of the WHO, whereby sugar refers to “all sugars added to foods or drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates”.

We have taken our primary 2050 transformational target (and their suggested upper and lower boundaries) from different sources, including EAT-Lancet,¹⁸ WHO-FAO¹⁷ and Afshin et al. (2019).¹ These sources provide recommendations on the daily intake of different food types and nutrients to ensure healthy and/or sustainable diets. It is important to note that for several of these categories, the scientific community has not fully established consensus. We have used upper and lower boundaries to account for the uncertainty and provide estimates of the changes required to achieve healthy and sustainable diets. As science develops further, the

extent of changes required will become clearer.

Across each region, we have used data from Springman et al.¹⁹ to showcase the changes required to meet the upper and lower boundaries in 2050, compared with current intake by region. This provides a useful, scientifically grounded reference point for changes required to improve environmental and health outcomes.

It is imperative to recognize that regional variations have a significant influence on diets. It is thus necessary to have local interpretation and adaptation of

the targets to reflect differences across geography, culture and demography. Further, accessibility, cost and affordability are additional challenges that we will need to overcome to meet the 2050 targets.⁸



Table 4: Summary of the 2050 transformational target, applied regionally

FOOD TYPE	TRANSFORMATIONAL TARGET BY 2050 (G/DAY.PERS)		RANGE OF CHANGE REQUIRED													
	Lower boundary (LB)	Upper boundary (UB)	WORLD ²⁰		AFRICA		ASIA AND PACIFIC		EUROPE		NORTH AMERICA		NEAR EAST		LATIN AMERICA AND THE CARIBBEAN	
			LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB
Whole grains	100	232	133%	440%	59%	268%	156%	495%	79%	314%	39%	222%	186%	563%	317%	867%
Vegetables	200	600	-29%	114%	69%	408%	-40%	81%	-13%	160%	-3%	190%	-55%	36%	80%	441%
Fruit	100	300	-36%	92%	-13%	161%	-26%	121%	-47%	60%	-47%	60%	-65%	5%	-58%	27%
Milk	0	520	-100%	127%	-100%	491%	-100%	297%	-100%	-10%	-100%	-10%	-100%	223%	-100%	59%
Beef, lamb and pork	0	27	-100%	-53%	-100%	4%	-100%	-37%	-100%	-72%	-100%	-76%	-100%	23%	-100%	-66%
Chicken and other poultry	0	58	-100%	107%	-100%	263%	-100%	263%	-100%	57%	-100%	-33%	-100%	21%	-100%	-3%
Eggs	0	25	-100%	-4%	-100%	150%	-100%	-4%	-100%	-14%	-100%	-22%	-100%	67%	-100%	-14%
Fish	0	100	-100%	257%	-100%	488%	-100%	223%	-100%	300%	-100%	285%	-100%	669%	-100%	733%
Legumes	0	100	-100%	355%	-100%	233%	-100%	355%	-100%	809%	-100%	733%	-100%	317%	-100%	186%
Nuts and seeds	0	75	-100%	733%	-100%	400%	-100%	838%	-100%	477%	-100%	341%	-100%	188%	-100%	2400%
Sugar	0	50	-100%	9%	-100%	47%	-100%	52%	-100%	-18%	-100%	-47%	-100%	-12%	-100%	-44%
Sodium	1	2	-81%	-61%	-65%	-31%	-84%	-69%	-75%	-49%	-80%	-60%	-74%	-48%	-73%	-45%

Note: In the cases where the lower level of consumption is greater than the estimated lower boundary, we reported a reduction in consumption, even for those food types for which higher consumption is highly recommended. This simply indicates that consumption of those food types is, on average, within the lowest boundary of the target range, but in general higher consumption of such foods may still be strongly recommended.

For several food types (including different types of meat and milk), where the scientific literature has identified the lower boundary of the transformational target for daily consumption as 0 g per day, we describe the rate of change required to achieve this in this table as -100%.

- Between 0% and -10%
- Between -10% and -50%
- <-50%
- Between 0% and 10%
- Between 10% and 50%
- >50%

Given where the sector is today, business must achieve, by 2030, at least 30% of the change required to meet the 2050 target for daily consumption of specific food types. This is the strict minimum to achieve the 2050 goal, as demand for food will continue to increase in line with population growth while its production will take place within increasingly more challenging planetary boundaries. We must act quickly and not delay critical actions to later decades.



Table5: Summary of 2030 transformational target (to meet 30% of the 2050 goal)

FOOD TYPE	TRANSFORMATIONAL TARGET BY 2050 (G/DAY.PERS)		RANGE OF CHANGE REQUIRED													
			WORLD ²⁰		AFRICA		ASIA AND PACIFIC		EUROPE		NORTH AMERICA		NEAR EAST		LATIN AMERICA AND THE CARIBBEAN	
			LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB
Whole grains	100	232	40%	132%	18%	80%	47%	148%	24%	94%	12%	67%	56%	169%	95%	260%
Vegetables	200	600	-9%	34%	21%	123%	-12%	24%	-4%	48%	-1%	57%	-16%	11%	24%	132%
Fruit	100	300	-11%	28%	-4%	48%	-8%	36%	-14%	18%	-14%	18%	-20%	1%	-17%	8%
Milk	0	520	-30%	38%	-30%	147%	-30%	89%	-30%	-3%	-30%	-3%	-30%	67%	-30%	18%
Beef, lamb and pork	0	27	-30%	-16%	-30%	1%	-30%	-11%	-30%	-22%	-30%	-23%	-30%	7%	-30%	-20%
Chicken and other poultry	0	58	-30%	32%	-30%	79%	-30%	79%	-30%	17%	-30%	-10%	-30%	6%	-30%	-1%
Eggs	0	25	-30%	-1%	-30%	45%	-30%	-1%	-30%	-4%	-30%	-7%	-30%	20%	-30%	-4%
Fish	0	100	-30%	77%	-30%	146%	-30%	67%	-30%	90%	-30%	85%	-30%	201%	-30%	220%
Legumes	0	100	-30%	106%	-30%	70%	-30%	106%	-30%	243%	-30%	220%	-30%	95%	-30%	56%
Nuts and seeds	0	75	-30%	220%	-30%	120%	-30%	251%	-30%	143%	-30%	102%	-30%	57%	-30%	720%
Sugar	0	50	-30%	3%	-30%	14%	-30%	15%	-30%	-5%	-30%	-14%	-30%	-4%	-30%	-13%
Sodium	1	2	-24%	-18%	-20%	-9%	-25%	-21%	-22%	-15%	-24%	-18%	-22%	-14%	-22%	-14%

Note: In the cases where the lower level of consumption is greater than the estimated lower boundary, we reported a reduction in consumption, even for those food types for which higher consumption is highly recommended. This simply indicates that consumption of those food types is, on average, within the lowest boundary of the target range, but in general higher consumption of such foods may still be strongly recommended.

For several food types (including different types of meat and milk), where the scientific literature has identified the lower boundary of the transformational target for daily consumption as 0 g per day, we describe the rate of change required to achieve this in this table as -100%.

- Between 0% and -10%
- Between -10% and -50%
- <-50%
- Between 0% and 10%
- Between 10% and 50%
- >50%

FOOD WASTE

Transformational target: Halve food waste by 2030, in line with the Sustainable Development Goal (SDG) 12.3, which states:

“by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses”.

Around one third of all food produced for human consumption is lost or wasted

from farm to fork. This systemic failure has economic, social and environmental impacts. Food loss and waste causes about USD \$940 billion per year in economic losses. It exacerbates food insecurity and malnutrition. Moreover, food that is ultimately lost or wasted consumes about a quarter of all water used by agriculture, requires a land area the size of China and is responsible for an estimated 8% of global greenhouse gas emissions.¹²

Halving food waste by 2030 is an imperative that presents a “triple win” for the economy, for food security and for the environment as it can save money for farmers, companies and households while creating new business opportunities, feeding more people with the same level of production, and alleviating pressure on the environment – particularly concerning natural resource use and climate change.²¹



⑤ Call to action



5 Call to action

KEY ACTION AREAS

Table 2 identifies action areas to achieve the necessary food system transformation, covering the consumption part of the food supply chain and specific business-led solutions. We present here a range of change-driven actions that businesses and other actors need to take to tackle the sector’s key issues – holistically rather than in isolation. Companies should consider all action areas and prioritize the ones that are most material to the

scope of their product portfolios, offerings and operations throughout the entire value chain.

The breadth of actions identified in this Roadmap highlights the scale of change required. Some of the desired outcomes of the Roadmap appear to be in tension with one another or to require trade-offs (for example, the idea of offering food that is both more environmentally sustainable and more affordable for consumers).

This is not because the targets are opposing; rather, they will require new ways of working and changes in incentives alongside individual business-led solutions to realize them fully.

The transformational targets outlined earlier in the Roadmap should guide the solutions identified within these key action areas. Companies should also set key performance indicators for new policies or business approaches to monitor and ensure compliance and success.

Table 6: Action areas to achieve food system transformation

	ACTION AREA	SUB-ACTION AREA
1	Adjust menus, product portfolio mixes and product formulations to improve nutrition and sustainability and reduce food waste	Improve the nutrition and environmental profile of food products, meals and offerings
		Innovate in food processing and supply chain management
2	Increase the share, diversity and sustainability of plant-based foods	Increase the proportion of plant-based foods in food products, meals, and offerings
		Work with other actors within and outside of the value chain to increase the consumption of healthy and sustainable plant-based foods
3	Increase protein diversity and sustainability performance	Improve the sustainability performance of animal-based proteins
		Expand healthy and sustainable alternatives to animal protein sources
4	Support consumers to choose and access healthy and sustainable food and reduce food waste	Shape consumer awareness and demand for healthy and sustainable food
		Change consumer-facing business and consumer behavior to reduce food waste

COLLECTIVE ACTION

To achieve systemic transformation, it will be critical to collaborate and build coalitions across and outside of the sector. Companies need to establish more effective collaboration with diverse stakeholders along the value chain and beyond, considering how their actions can complement those of others who are working towards the same goals (e.g., consumer advocacy groups). Key collaborative business-led solutions for food and agriculture companies to drive the necessary shift to healthy and sustainable diets should focus on the following:

- **Working with other companies across the value chain** to promote healthy and sustainable products and meals (e.g., food manufacturers, retailers, workforce food

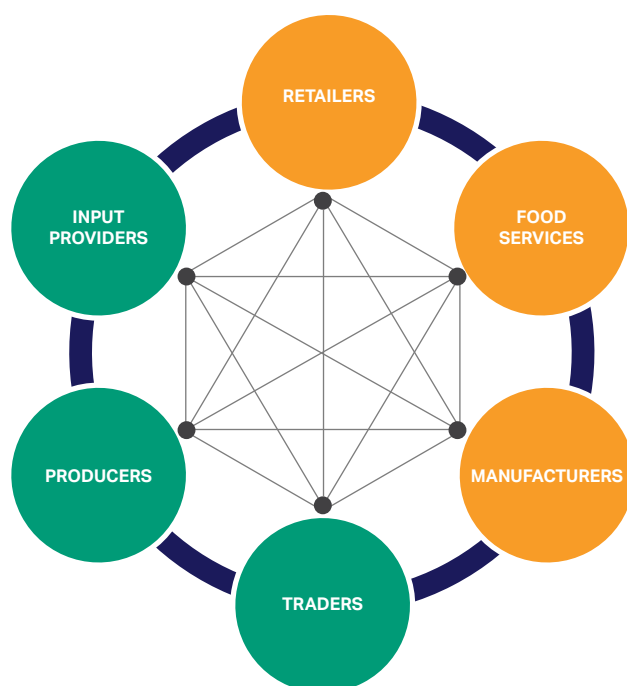
canteens and other food service companies working together on the selection and placement of healthy and sustainable products);

- **Collaborating with peers, academia, government and civil society** to commit to promoting a national transition to healthy and sustainable diets in a transparent and traceable fashion;⁷
- **Promoting coalition building** across value chains and regions to advance and accelerate legislation on a national and international level that supports the shift to a healthy and more sustainable food system (e.g., harmonization of international legislation).²²

While this chapter of the Roadmap focuses on the consumption end of the value chain, companies should actively engage other actors across the food chain and use collective action to drive maximum impact. Figure 2 illustrates this need for collective action between different actors across the value chain.

Policy support to enable these changes will also be critical, for example through incentives for innovation, support to farmers making the transition to more sustainable agriculture, the development of carbon pricing and other mechanisms to integrate externalities, and consumer education. A comprehensive list of policy recommendations to support the development of healthy and sustainable diets complements this chapter.

Figure 2: Collective action across the food value chain



⑥ Solutions to achieve healthy and sustainable diets



⑥ Solutions to achieve healthy and sustainable diets

Dietary shifts and food waste reductions are critical components of food system transformation. Companies have an important role to play in providing consumers with access to a greater range of healthy and sustainable foods while also supporting them to make the right consumption choices.

Building on the body of work developed by the FReSH project, we map out the key action areas and a series of business-led solutions to achieve dietary shifts and reduce food waste below, covering direct pathway 3: “Shift diets to be healthy and sustainable” and [partially] 4: “Minimize food loss and waste,”²³ from the CEO Guide to Food System Transformation.

We have structured the first three action areas around the themes of positive nutrition (1), plant-forward foods (2) and protein (3), while the final action area (4) is consumer-focused and cuts across each of these three themes.



ACTION AREAS

1. ADJUST MENUS, PRODUCT PORTFOLIO MIXES AND PRODUCT FORMULATIONS TO IMPROVE NUTRITION AND SUSTAINABILITY AND REDUCE FOOD WASTE







Food value chain companies should improve the nutrition and sustainability associated with their products, meals and offerings.

They should use reformulation and fortification techniques and set standards for more healthy and nutritious foods, thereby addressing the growing global challenges of malnutrition and non-communicable and communicable diseases. The COVID-19 pandemic has notably revealed that people affected by noncommunicable diseases (NDCs) such as cardiovascular

and respiratory diseases, diabetes or cancer, are also at higher risk for severe complications.^{24,25}

To tackle this issue, it is critical for businesses to invest in new technologies and techniques that further improve the sustainability and nutritional profile of products. In addition, the adoption of circular practices can help reduce food waste across the supply chain.

Sub-action area: Improve the nutrition and environmental profile of food products, meals and offerings

SDG Impact						
Solutions					Prioritization for collective action	Prioritization for individual company action
Adjust product portfolios to improve the nutrition and sustainability of food products, meals and offerings, while maintaining taste, accessibility and affordability for all.						
Reformulate products and/or recipes to improve their nutritional content and taste, as well as their sustainability. ²⁶						
Fortify appropriate foods (products, recipes ingredients, etc.) to increase micronutrients (particularly important for food insecure populations). ²⁸						
Use adequate processing technologies and practices to preserve nutrients and enhance environmental sustainability across the supply chain (e.g., through adequate cooling and packaging technology, production and processing practices, transportation/ logistics and storage). Consider the role of new business models in valuing waste products.						
Improve packaging design and functionality to preserve nutrients and enhance environmental sustainability (e.g., reducing the weight of packaging and using modified atmosphere packaging, increased use of resealable packaging with improved seal integrity, etc.). ²⁷						
Use sourcing standards to procure a diverse range of healthy and nutritious ingredients. ²⁸						
Develop sustainable sourcing policies (e.g., zero deforestation, sustainable land-use, appropriate water stewardship) for key ingredient commodities (e.g., soy, palm) to reduce the conversion of important ecosystems (e.g., tropical forests). ³⁰						

 high-level priority  medium level priority  low level priority

CASE STUDY: Continuous nutrition improvement (Danone)

Description: Building on longstanding nutritional improvement history, Danone made commitments in 2016 to reach stringent nutrition targets derived from international recommendations by 2020, including maximum thresholds for energy, sugar and saturated fats, and minimum amounts for protein and calcium, among others. It defined bold reformulation and innovation for top brands in dairy, aquadrinks (low-sugar beverages) and early life products in order to deliver tasty products with an improved nutrition profile while keeping consumer preference, with a specific focus on lowering sugar content – a key priority for early life, children and tweens brands.

Partners involved: Danone research & innovation, marketing, sales, quality, procurement, with the strong support of the top management, ingredient suppliers, governments.

Impact: By the end of 2019, 82% of the volumes of products Danone sold during

the year were compliant with its 2020 nutrition targets, unlike the 67% registered at the end of 2016. Reformulation resulted in a 12.4% reduction in added sugars since 2014 in dairy products globally, of which a 22% reduction was in products for children and tweens. Added sugars decreased by 66% between 2016 and 2019 in early life nutrition products, and 98% of aquadrinks contained less than 5% added sugar (less than half that in regular soft drinks). Reformulation and innovation delivered a significant contribution to national reformulation roadmaps launched by local authorities in different countries (e.g., the UK, Italy, US) in collaboration with local stakeholders (e.g., trade association, scientific societies).

Barriers: The main barrier faced was consumer acceptance of products that are less sweet, especially in countries where local governments did not foster a global sugar reduction market dynamic. In Europe, stringent European

Union regulations on nutrition claims (sugar reduction means companies can only list it for products containing 30% less sugar content than the market average) limit communications from companies about small sugar reductions to consumers. For these reasons, successful reformulation required a step-by-step approach over a long period of time, mobilizing significant company resources (people, budget).*

* https://www.danone.com/content/dam/danone-corp/danone-com/about-us-impact/policies-and-commitments/en/2019/Danone_Nutritional_Targets%202020_Dec_2019.pdf



Source: Danone

CASE STUDY: Africa Improved Foods (DSM)

Description: Africa Improved Foods (AIF) is an African social enterprise addressing the food challenges facing Africa by building resilient food systems through local and regional sourcing, manufacturing and selling of nutritious, affordable and accessible products. AIF manufactures in Rwanda and sells to Tanzania, Kenya, South Sudan, Rwanda and Uganda. It aims to scale this model further across Africa. AIF products include mineral and vitamin-rich porridge for the local population, especially pregnant women and those who are breastfeeding, as well as children. AIF has furthermore established logistics to source from African farmers to create jobs throughout the agricultural value chain, either directly, indirectly or induced.

Partners involved: A public-private partnership between Royal DSM, the Rwandan government, International Finance Corporation (IFC), FMO (a Dutch development bank), and CDC (the UK's development finance institution).

Impact: AIF launched in 2016 in Rwanda and it is reaching over 1.6 million people per year on a daily basis. AIF is contributing over USD\$1 billion in discounted net incremental benefits to the African economy,* created over 300 direct jobs, and sourced from over 130,000 smallholder farmers. Over the past 3 years AIF has grown to around USD \$50 million in revenues and has proven that this model can be profitable while contributing to SDG 1 (No Poverty), SDG 2 (Zero Hunger) and SDG 13 (Climate Action).

Barriers: Market creation for available, affordable and aspirational, nutritious, safe and healthy food is one of the main barriers, together with raw material sourcing, including assuring the quality of locally produced crops (e.g., high aflatoxin levels in maize). AIF, together with its partners, addresses the issue of aflatoxin contamination, a major cause of liver damage, through an improved value chain approach of post-harvest interventions for farmers (e.g., free maize shelling services at centralized facilities).

*Net present value of total incremental revenue (Includes direct, indirect, and induced) to Rwanda (~USD \$750 million) and wider East Africa region (~USD \$250 million) over the 2016 – 2031 period.
<https://africaimprovedfoods.com/>



Sub-action area: Innovate in food processing and supply chain management

SDG Impact	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	6 CLEAN WATER AND SANITATION	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	17 PARTNERSHIPS FOR THE GOALS
Solutions	Prioritization for collective action		Prioritization for individual company action			
Invest in technology (e.g., precision biology) to create innovative, healthy and sustainable foods with superior nutritional and environmental profiles (e.g., healthy food redesigned for convenience). ^{24,29}	L		H			
Use and develop improved food processing and logistics techniques to enhance food safety and quality while maintaining accessibility and affordability (e.g., irradiation, high-pressure, extrusion, and freeze-drying). ³⁰						
Develop technologies and logistics to optimize processing and preservation across the value chain (particularly for fresh foods) and reduce waste. ³⁰						
Improve shelf life innovations or invest in developing new methods that slow food degradation even without refrigeration. ¹²						
Adopt circular practices to improve food packaging and minimize the introduction of virgin and non-recyclable materials (e.g., certain plastics) while enhancing product shelf life. ³						
Commit to sharing knowledge on processing technology and innovation with small and medium-sized enterprises and other stakeholders in developed and developing countries that would otherwise not have access to such technologies.						
Develop sustainable water-use policies across manufacturing and processing operations.						

H high-level priority **M** medium level priority **L** low level priority

CASE STUDY: Partners in Food Solutions (Bühler)

Description: General Mills launched Partners in Food Solutions in 2008 to help develop an underleveraged link across the food value chain – food processors and mills – to build and grow the entire African food economy. Corporate volunteers provide expertise to strengthen companies, from facility design to product development. The objective is to provide the technical and business know-how that African food companies need to develop. Strengthening the middle of the value chain has a ripple effect: consolidating markets for smallholder farmers and bringing more nutritious food to consumers. Corporate volunteers share their expertise with African entrepreneurs while honing their own skills.

Partners involved: Bühler, Cargill, DSM, General Mills, Ardent Mills, Hershey, Smuckers.

Impact: Since 2008, Partners in Food Solutions has contributed 1,371 active volunteers from corporate partners to provide 50 billion safer, more nutritious and affordable meal servings; 1,641 entrepreneurial food companies in Africa have received assistance or training from volunteer experts; women own or manage 34% of these client companies. Partners in Food Solutions client companies are located in 10 African countries, impacting 1.3 million smallholders that are part of their supply chains, for a total of 20,700 employees.

Barriers: Partners in Food Solutions clients across Africa face several significant barriers to producing safe, nutritious food that is affordable for local consumers. These obstacles include: difficulty accessing consistent, high-quality raw materials due to instability in supply (e.g., drought) and inconsistent quality (e.g., due to farmer practices); infrastructure challenges such as transportation/roads and power outages; unclear and complicated government regulations and processes; economic instability/fluctuation; difficult access to capital and high interest rates; lack of local technical staff/trained personnel.

<https://www.partnersinfoodsolutions.com/annual-report-2020>



CASE STUDY: The French Peach Project (Bayer CropScience)

Description: Peaches grown in France have a reputation for top quality – big, tasty, healthy fruit with a relatively long shelf life. To deliver this quality, La Melba and Bayer CropScience entered a Food Chain Partnership aimed at testing a new solution for growing and protecting peaches. The French Peach Project brings together these two partners to demonstrate that Luna®, an innovative new crop protection product from Bayer CropScience, can deliver increased fruit quality, prolong shelf life, and significantly reduce waste. A secondary goal of this program was to evaluate the economic benefits of a Luna®-based spraying program along the food value chain.

Partners involved: La Melba, Bayer Crop Science France

Impact: The use of Luna® avoided tons of losses: for every 1,000 peaches harvested, the Luna® program saved 84 from decay or worse after 14 days of storage. The company estimates the economic value of the losses avoided by spraying with Luna® at around €3,000/hectare. This amount does not take into account the money the producer organization might have had to pay for the return shipment of damaged fruit. La Melba now sees these trials as a great opportunity

to learn how to better manage post-harvest losses simply through field interventions. Estimates show that both the producer organization and the retailers benefit from the longer shelf life Luna® makes possible.

Barriers: There is a knowledge gap on the need of reducing food waste and its general agronomic importance. Extended shelf-life after harvest poses few immediate direct benefits to peach growers, and disease-free peaches can be undervalued at harvest.

https://www.cropscience.bayer.com/sites/cropscience/files/inline-files/K41885_Case_Study_French_Peaches_MASEN_210114_ES_web_Preview.pdf



ACTION AREAS

2. INCREASE THE SHARE, DIVERSITY AND SUSTAINABILITY OF PLANT-BASED FOODS

A key lever to achieve healthy and sustainable diets is to increase the share and diversity of plant-based foods within products and meals, providing a variety of appealing and nutritious intake forms for consumers. The need to do so has become even more critical amid

the COVID-19 pandemic, which has increased the consumption of long shelf life, packaged and transformed food rather than fresh choices because consumers shop for groceries less often.

However, it is also important that companies maintain a global nutrition and sustainability view when considering adjustments to food products, meals and

offerings. Increasing plant-based ingredients in foods should indeed not come at the expense of other nutritional considerations (e.g., salt content) nor sustainability considerations (e.g., sustainable sourcing). In addition, collaboration with other value chain actors to reduce plant-based food waste should be encouraged as a means to increase access to food.

Sub-action area: Increase the proportion of plant-based foods in products, meals and offerings

SDG Impact					
    					
Solutions				Prioritization for collective action	Prioritization for individual company action
Increase the share and diversity of plant ingredients and plant-based food products, integrating a variety of crops to enhance environmentally sustainable and nutritionally healthy consumption.				M	H
Increase the share and diversity of imperfect plant ingredients and food products.					
Increase the diversity in supply of plant-based foods in retail and grocery stores, considering the seasonality and provenance of fresh products.					
Increase the amount and diversity of nutrient-rich plant-based foods in products and meals, including fruits, vegetables, legumes, nuts, seeds and whole grains (e.g., increase the volume of plant-based foods in ready meals by committing to offering a greater proportion of plants per serving). ^{2,31,32}					
Increase the variety of intake forms of healthy and sustainable foods to make consumption of these foods more convenient, varied and appealing (e.g., developing healthy, fresh, plant-based grab-and-go snacks; integrating larger amounts of healthy plant-based foods into processed snacks, etc.). ²⁴					

H high-level priority **M** medium level priority **L** low level priority

CASE STUDY: MorningStar Farms® (Kellogg Company)

Description: The MorningStar Farms® mission stems from a simple truth: plant-based food is better for people and the planet. Incogmeato™ by MorningStar Farms® is a new line of next-generation plant-based protein that looks, cooks and tastes just like meat. This project aligns with the objective of Kellogg's to drive significant impact in plant-based eating by increasing the availability and awareness of plant-based foods and ensuring that consumers have plant-based alternatives across more foods and occasions.

Partners involved: Grocery stores nationwide, including TOPS, Wegmans, Weis, Price Chopper, Gelson's, HyVee, and select Kroger, Albertsons,

Safeway, Meijer, Ingles, Walmart, and more, have partnered with Kellogg's to support MorningStar Farms®.

Impact: The Kellogg's plant-based meats category grew more than 37% between 2017 and 2019, highlighting the growing demand for plant-based meats. MorningStar Farms® is part of the Kellogg's Away from Home channel in over 45,000 locations and it can be found at 25,000 retail grocery stores across the US. This is allowing more consumers access to plant-based alternatives and the ability to make small changes.

Barriers: Prejudice towards plant-based foods has been a major barrier as many consumers are still afraid that plant-based

foods will not taste as good. In addition, consumers do not see some types of plant-based proteins as readily accessible. Morningstar Farms® is trying to tackle both barriers by making tasty and appealing plant-based foods that are readily available in grocery stores at a competitive price point.

www.morningstarfarms.com/incogmeato/home.html



Source: Kellogg

Sub-action area: Work with other actors within and outside of the value chain to increase the consumption of healthy and sustainable plant-based foods

SDG Impact	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	15 LIFE ON LAND	17 PARTNERSHIPS FOR THE GOALS	Solutions	Prioritization for collective action	Prioritization for individual company action
							Use taster sessions, plant-forward taster pots and vegetable focused recipe ideas to encourage consumers (especially children) to try different new and different types of plant-based foods.		
							Increase collaboration between retailers and producers to reduce unnecessarily restrictive specifications for retailing of fruits and vegetables, thereby reducing waste of plant-based foods (i.e., revising size and aesthetic requirements).		
							Work with restaurants, workforce food providers, culinary training institutions, etc. to improve training in plant-based meals, thereby increasing availability and reducing plant-based food waste.		
							Work with government institutions to facilitate increased procurement of and ensure equitable access to healthy and sustainable plant-based foods (e.g., through Healthy Start programs, school fruit and vegetable schemes, etc.). ³⁷	M	L
							Work with manufacturers, retailers and food service providers to adapt distribution models to ensure affordability and equitable access to plant-based foods and to encourage more plant-based meals as default options (rather than defaulting to meat-based). ³³		
							Work with food service companies to update menu descriptions to make plant-based options more appealing to customers (e.g., remove the "vegetarian" section on menus and integrate with the rest of the entrees; use more appealing language, like "field grown" or "heritage" to describe vegetable options, instead of terms like "meat-free", "vegetarian", or "vegan"). ³⁸		

H high-level priority **M** medium level priority **L** low level priority

CASE STUDY: Future 50 Foods Report (Unilever)

Description: The Future 50 Foods Report published in 2019 provides a tangible solution to help improve the health of people and the planet via meals. It begins by outlining the food system issues and goes on to identify 50 of the foods humans should eat more of. The intention is to make the well-supported recommendation of eating more plants understandable and tangible.

Partners involved: Knorr, WWF-UK, and Dr Adam Drewnowski from the University of Washington wrote the report with input and review from experts at Bioversity International, Crops for the Future, EAT Foundation, Food

and Land Use Coalition (FOLU), Food Reform for Sustainability and Health (FReSH), GAIN, Global Crop Diversity Trust, Gro Intelligence, Oxfam GB, SDG2 Advocacy Hub, Wageningen University, and Yolélé Foods. Knorr is working with suppliers and smallholder farmers to sustainably grow Future 50 Foods, which the company has and will continue to integrate into its products, programs and partnerships.

Impact: The report has reached more than 476 million people in 19 countries; 10 global conferences/ events have featured it; and over 50 media partners, NGOs, experts and businesses have shown interest. Knorr has built its product innovations into the Future 50 Foods in 10 countries, with

14 products launching in the coming years.

Barriers: Barriers include lack of awareness, availability and supply of the Future 50 Foods, but the partners are working together to remedy these barriers. The lack of cooking and preparation knowledge and tools is another challenge. Chefs have been involved to educate and inspire people to cook with these diverse, nutritious ingredients. Another barrier is the lack of knowledge of technical feasibility and qualities of the foods, making it risky and not cost effective to propose use in certain product formats.

<https://www.unilever.com/news/news-and-features/Feature-article/2019/knorr-and-wwf-uk-introduce-50-future-foods.html>



Source: Unilever

ACTION AREAS

3. INCREASE PROTEIN DIVERSITY AND SUSTAINABILITY PERFORMANCE

Protein plays a critical role in people's lives and the health of the planet: daily protein intake is indispensable to keep human cells in good shape; yet animal protein production is a major source of greenhouse gas emissions and natural resource depletion. A key lever to deliver healthy and sustainable diets is thus to ensure that people's diets are composed of a healthy mix of proteins produced sustainably.

Achieving this goal will only be possible by tackling two solution areas: ensuring that all livestock production within dietary recommendations is sustainable; shifting consumer preferences to a healthy and sustainable balance of nutritious plant-based and animal-based foods.

This will require coordinated action from food and agriculture value chain companies as the COVID-19 pandemic has shown that the approach to protein

production and consumption is suffering intensely from efforts that are far too fragmented. In particular, the pandemic has shed light on unsustainable working conditions in several meat plant facilities and dramatically increased the loss and waste of foods containing protein. For example, in the first months of the pandemic, US farmers dumped 3.7 million gallons of milk each day and a single chicken processor smashed 750,000 unhatched eggs every week.³⁴

Sub-action area: Improve the sustainability performance of animal-based proteins

SDG Impact		2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	15 LIFE ON LAND	17 PARTNERSHIPS FOR THE GOALS
Solutions							Prioritization for collective action	Prioritization for individual company action
Source food, including meat and animal feed, from a credible certified standard (e.g., Animal Welfare Approved or the Global Animal Partnership for high-welfare livestock or the Soil Association for organic certification). ³⁵								
Improve the environmental and social performance of existing meat, dairy and egg-based products and meals (e.g., through animal precision feeding, sustainable feed practices or improved farming practices). Companies can use the WBCSD FReSH Protein Impact Measurement Framework to support better decision-making.								
Increase the supply of sustainable fish through improved aquaculture and wild fisheries practices and management. ²							M	M
Develop regenerative and circular production processes related to animal proteins to improve environmental performance (e.g., using waste or by-products as inputs for other production processes).								
Increase R&D spending to develop alternatives to common animal proteins used in products and meals (e.g., insect-based and laboratory-grown cultured proteins). ⁷								
Reformulate existing products and recipes to contain fewer animal-based proteins to reduce environmental impact. ³⁶								

H high-level priority **M** medium level priority **L** low level priority

CASE STUDY: Chicken – every part is the best part (Symrise)

Description: Circular economy has become increasingly important globally in recent years. Symrise uses by-products and side-streams from various raw material processes to develop valuable products. Symrise finds uses that did not previously exist and, in doing so, responds to major challenges facing the Earth, from climate change and biodiversity loss, to nourishing an ever-growing number of people. In its nutrition segment, including Diana Food, Diana Pet Food and Diana Aqua, and the recently acquired ADF/IDF, by-products already account for a large proportion of sales. As an example, Symrise Nutrition chicken-based solutions come from 100% chicken side-stream raw materials (e.g., carcasses, livers), which

provide different functionalities and products, from food to pet food. With the No Waste program, Symrise has identified some 50 side-stream materials from production and is investigating and developing new ways and solutions to valorize them, either for food or pet food, to fertilize soils or transform them into biofuel through methanization.

Partners involved: Internal stakeholders within Symrise (cross-segment specialists), public and private partnerships (universities, start-ups, fertilizer companies).

Impact: Since the launch of this project in 2017, Symrise Nutrition has reduced by 50% the tonnage of chicken waste in its production by innovatively valorizing side-stream materials into new food

and pet food applications, avoiding sending valuable material to landfill.

Barriers: One of the challenges is to embrace the entire organization (e.g., purchase, production, supply chain, R&D, marketing and sales) and to involve experts across segments (e.g., scent and care) from different disciplines to re-think problems and consider possible solutions from different angles. The design thinking step requires regulatory expertise to ensure that the new application complies with regulations (within food, pet food and outside these sectors). The most important challenge is to establish a solid supply chain for the side-stream.

<https://www.diana-symrise.com/>



CASE STUDY: Veramaris®: Sustainably farmed salmon (provided by Evonik)

Description: Veramaris produces omega-3 fatty acids for animal nutrition from microalgae. It has pioneered ground-breaking technology to deliver an algal oil with high levels of both EPA & DHA Omega-3, free from contaminants. Veramaris' algal oil technology for salmon feed is a more environmentally sustainable alternative to fish oil, and it delivers superior taste, texture, color and nutritional benefits. Just one ton of algal oil helps preserve 60 tons of wild fish in the oceans, which would otherwise have been caught to produce fish oil.

Partners involved: Evonik and DSM, with the collaboration of the entire aquaculture value chain, from feed millers and fish farmers to processors and retailers.

Impact: 30% of Norwegian farmed salmon is now being fed on diets partly containing algae and much of that comes from Veramaris. French supermarket Match saw a 12% growth in its salmon category following the introduction of sustainable salmon raised on a diet which included Veramaris' algal oil. TESCO, Auchan, Kaufland and Cora are other examples of retailers that proactively adopted algae fed salmon.

Barriers: Veramaris' team had to address questions and concerns about this innovative product and how it compared to traditional ingredients. A sequence of trials had to be made to demonstrate Veramaris' safety, performance and the efficacy of the feed ingredient when fed to the target animals. Several stakeholders throughout the value chain have collaborated to build trust in the ingredient, the operational stability and the robustness of the supply chain. A series of ISO compliant, critically-reviewed life-cycle assessment studies were conducted to demonstrate the sustainability of the algal oil product.

<https://www.veramaris.com/home.html>



Source: Evonik

CASE STUDY: Maple Leaf 50/50 (Maple Leaf)

Description: Consumer desire to eat less meat for health and environmental benefits has driven significant growth in meat alternatives. The Maple Leaf brand's consumers, mostly parents shopping for their families, desire healthy, affordable meals made with natural ingredients that their kids will want to eat. They are traditionally meat-eaters, interested in plant-based foods and looking to make sustainable food choices. To address this request and reduce collective meat consumption, Maple Leaf Foods launched a new line of protein products in early 2020: Maple Leaf 50/50™. The products contain 50% plant-based protein to offer a simple and easy to understand list of

ingredients, combined with 50% meat to deliver the familiar taste and texture that families love.

Impact: After less than 6 months on the market, the Maple Leaf 50/50 concept is resonating with consumers and piquing interest from coast to coast. The launch campaign reached 93% of Canadians an average of 26 times in a 3-month period. YouTube results have registered at three times the CPG average for brand lift and are driving a 22% lift in purchase intent across English-speaking Canada, while campaign creative has resulted in a 134x lift in daily traffic to the Maple Leaf brand website. The company makes its product line with recyclable packaging that carries its Carbon Zero logo, reflecting

the fact that Maple Leaf Foods is the world's first major food company to become carbon neutral.

Barriers: Consumer belief that plant-based proteins compromise on taste and consumer desire to reduce, but not eliminate, meat from their diet remain proven barriers to the increased consumption of plant-based proteins. Education on the health, environmental and sensory benefits of Maple Leaf 50/50™ are needed to access the consumer consideration set, while product trials are needed to drive acceptance and product adoption.

<https://www.mapleleaf.ca/maple-leaf-50-50/>

Source: Maple Leaf



Sub-action area: Expand healthy and sustainable alternatives to animal protein sources

SDG Impact		
Solutions	Prioritization for collective action	Prioritization for individual company action
Invest in the development of healthy and sustainable substitutes to animal proteins (e.g., meat, dairy, eggs, fish) using plant-based alternatives that recreate similar textures and tastes for consumers who still want to enjoy the experience of eating animal-based food. ³⁷	M	M
Increase R&D spending to improve the environmental and social performance of plant-based proteins. ^{7,38}		
Promote consumption of plant proteins and plant-based protein sources and meals that have environmental and health benefits when compared to animal-based protein. ⁴⁰		
Ensure that investments in the development of plant-based proteins are diverse and sustainable (e.g., increase global demand for and local investment in diverse plant-based protein crops). ³⁹		
Build consumer trust that alternatives to animal proteins that are reaching the market are safe and healthy. ⁷		
Use plant protein isolates and other advanced processing/fortification approaches to promote healthy and sustainable plant protein production and consumption. ⁴³		
Seek to change social norms of the view of animal products as the dominant ingredient within a meal, with plant-based foods as the side dish. ³⁸		
Work with manufacturers, retailers and food service providers to adapt distribution models to ensure affordability and equitable access to sustainable and healthy plant-based alternatives to animal proteins.		

H high-level priority **M** medium level priority **L** low level priority

CASE STUDY: The veggie hot dog (IKEA of Sweden)

Description: The IKEA hot dog has a long history, starting back in the 1980s. Ingvar Kamprad, founder of IKEA, set the price of the hot dog at half the common price for a hot dog in Sweden at the time. By introducing a vegetarian option to the iconic hot dog, IKEA wanted to stay true to that vision and offer a quick, convenient and truly affordable product for its visitors to enjoy their experience at IKEA.

Impact: The inclusion of the veggie hot dog to IKEA's food offer is contributing to the company's food goal to include more plant-based ingredients in the range and offer healthier and more sustainable products. Since the start of veggie hot dog sales in 2018, IKEA has sold more than 20 million in

IKEA Bistros around the world. At the same time, sales of the standard hot dog have declined, leading to an improved climate footprint as that of the veggie hot dog is around seven times less than that of the classic meat hot dog. The Swedish Food Market has seen the same development, where IKEA packages the veggie hot dog to take and enjoy at home.

Partners involved: IKEA developed the recipe with its suppliers to enable scalability – tasty and affordable for millions of visitors, available in more than 50 markets.

Barriers: As with any product made for a global market, it is challenging to find the flavor, appearance and texture that appeal equally to the many people in different markets. Equally, the regulatory landscape differs

around the world, which limits the list of ingredients to use for a common launch. IKEA did customer testing to decide the right recipe profile and worked closely with the global regulatory team to ensure compliance.

<https://www.ikea.com/ch/en/this-is-ikea/sustainable-everyday/veggie-dog-pub166a3131>



Source: IKEA

CASE STUDY: Vuna plant-based seafood alternative (Nestlé)

Description: Vuna is the latest innovation in Nestlé's plant-based product portfolio, which includes burgers, mince, meatballs, sausages, cold cuts, chicken nuggets, and chicken filets. Made from a combination of only five plant-based ingredients, Vuna is a plant-based seafood alternative suitable for vegans. With a high content of pea proteins, Vuna contains all the essential amino acids and is free of artificial colorings or preservatives. It is one of the most environmentally friendly sources of plant-based protein, which can help reduce overfishing and protect ocean biodiversity.

Partners involved: This project involved around 300 R&D scientists, engineers and product developers located

in eight Nestlé R&D Centers dedicated to the research and development of plant-based products. The company also collaborates strategically with researchers, suppliers, start-ups, and various other innovation partners.

Impacts: In the 2-week period following the August launch in Switzerland, Vuna received strong positive sentiment through online and social media with more than 1,870 mentions and 400 articles following its announcement. Overall consumer feedback has been extremely positive with Vuna gaining the supermarket COOP online consumer rating of 4.5. In Switzerland, Vuna received strong coverage by national broadcasters, and most major print and online media outlets. Vuna also received international coverage in mainstream wires,

including Bloomberg and Reuters, as well as a wide range of further mainstream and specialist publications and portals.

Barriers: Taste, texture and scalability at a market level have been the three main challenges faced. Nestlé has developed a proprietary technology to remove the intrinsic bitterness of the peas naturally and ensure consumer acceptability. It has used a proprietary, patented wet extrusion technology to address consumer expectations in terms of texture. The company's expertise in protein science and extrusion technology and its infrastructure have allowed it to scale rapidly from bench to kitchen.

<https://www.nestle.com/stories/plant-based-seafood-tuna>



ACTION AREAS








4. SUPPORT CONSUMERS TO CHOOSE AND ACCESS HEALTHY AND SUSTAINABLE FOOD AND REDUCE FOOD WASTE




To achieve WBCSD’s healthy people and healthy planet goals, companies need to bring consumers along on the journey through a range of communication

and behavior change approaches. As experience testifies, no single action is sufficient to achieve long-lasting behavior change. Businesses must thus pursue multiple approaches, taking into consideration people’s cultural backgrounds and local food preferences – particularly considering the global supply

chain disruptions arising from the COVID-19 pandemic. Companies can amplify the impact of their actions by engaging other professionals, such as doctors, social psychologists and dietitians, to support consumers on the necessary dietary and behavior shifts.

Sub-action area: Shape consumer awareness and demand for healthy and sustainable food

SDG Impact						
Solutions					Prioritization for collective action	Prioritization for individual company action
Use marketing and advertising to educate consumers on the role and use of fresh and processed foods in enabling healthy and sustainable diets and support them in shifting their consumption patterns (e.g., providing greater transparency on techniques used for food processing, preservation and reformulation).						
Increase acceptability and appeal of healthy and sustainable food by raising awareness about diverse, convenient nutrient-rich foods (e.g., plant-based foods). ^{42,40}						
Use technological advances in big data analytics and artificial intelligence to better understand consumer tastes and how to make healthy and sustainable choices more appealing. ^{7,33}						
Provide ideas for healthy seasonings and recipes that promote the consumption of healthy and sustainable meals in line with national/regional dietary patterns.						
Use smart labeling to enable consumers to make better choices – from a nutrition and sustainability point of view (e.g., by avoiding the use of terms such as “meat-free”, “vegan” or “vegetarian” to sell plant-based food). ^{41,42}						
Provide clear information on the nutritional and environmental profile of products and meals (e.g., ingredient lists, origin of ingredients and foods, consumer-friendly nutritional information).						
Consider selection, placement, signage and use of pricing and promotions to increase equal accessibility to healthy and sustainable products and meals ⁴¹ and nudge consumers towards choosing healthier alternatives while shopping.						
Use innovative approaches to enable access to healthy and sustainable foods (e.g., through retail store strategies such as including plant-based products in meal deals). ⁴²						
Increase awareness of healthy and sustainable dietary guidelines (e.g., refer to national and international dietary guidelines from reputable health bodies) and the importance of eating a balanced, healthy diet providing all the required nutrients.						
Use digital technologies to enhance transparency and traceability across the supply chain (e.g., using blockchain to provide consumers with accurate information related to transparency and traceability on apps, web sites, etc.).						
Build pride around local foods (e.g., retailers or food service menus having dedicated sections for local foods to encourage consumers to eat local, in-season produce). ⁴⁴						
Use social media and leverage community leaders (e.g., religious/spiritual leaders, educators, local campaign groups, etc.) to create a sense of community and accountability in promoting plant-rich diets. ⁴⁴						
Use campaigns to foster desirable behavior norms featuring specific trends in consumption (e.g., “fewer people in your community are eating meat”). ⁴⁴						
Engage other experts in the creation of marketing claims to enhance communication credibility and transparency.						

 high-level priority  medium level priority  low level priority

CASE STUDY: Food@Work program (Google)

Description: Google's Food@Work program features a balanced plant-forward approach, ensuring there is an abundance of choices that are good for the health of people and the planet. The Food Team worked to inspire chefs through collaboration, sharing global cuisines, building innovative techniques in vegetable cooking and supporting operational excellence with validated recipes and training. The program redesigned food spaces and menus to nudge users toward better food choices and eating habits, such as minimizing overeating and food waste and offering foods with appealing names to better position them as the desirable choice. It still includes animal protein in the culinary repertoire but with intentionally reduced frequency and teams work to re-establish norms for a strong value proposition on the plate.

Partners involved: Google works collaboratively with expert organizations such as the World Business Council for Sustainable

Development (WBCSD), Yale Center for Customer Insights, EAT Foundation, Culinary Institute of America (CIA), Arizona State University (ASU) Swette Center for Sustainable Food Systems, World Resources Institute (WRI), Better Buying Lab (BBL), LeanPath and numerous others.

Impact: Google has reduced meat consumption on average across the global program. In the Bay Area, for example, reductions in animal protein have resulted in an 11% decrease of our carbon footprint from food between 2017 and 2019. Surveys of consumers show they are happy with their food program

and 71% report they eat healthier at work than at home.

Barriers: Perceived taste and enjoyment can be a barrier to healthier food choices. Although culinary confidence and skill are essential to consistently delivering deliciousness, many culinarians have not had specific training or the chance to develop expertise in vegetable and plant-rich cooking.



Source: Google

Sub-action area: Change consumer-facing business and consumer behavior to reduce food waste^{43,44}

SDG Impact						
						
Solutions					Prioritization for collective action	Prioritization for individual company action
Improve food and product placement and display to encourage the reduction of food waste (e.g., promote or market products and food with shorter expiration dates). ⁴⁵					M	L
Use smart labelling to encourage and help employees and consumers reduce food waste (e.g., use best practice date labelling and freezing logo, provide prominent, clear guidance on storage, freezing and defrosting). ²⁹						
Promote more appropriate portion sizes educate food value chain employees and consumers and promote collaboration between manufacturers, retailers, restaurants and other key food environment actors (e.g., delivery services) to facilitate the use of smaller portion sizes (e.g. provide information, visuals on pack or other tools to make it easy to know how much to use and consume). ²						
Educate consumers on improved leftover management, such as providing clear information on when food has gone bad and how consumers can repurpose food waste (e.g., using old bread to make breadcrumbs), and provide recipes to use up leftovers.						
Improve communications across the supply chain (e.g., between suppliers, retailers and consumers) to minimize instances where products are not in alignment with quality standards, close to sell-by date or returned. ²⁹						
Educate consumers on the most sustainable ways to dispose of food waste, particularly focusing on early education for children (e.g., providing information on the benefits of composting). ²⁹						
Improve access for food value chain employees and consumers to sustainable disposal methods (e.g., composting).						

H high-level priority **M** medium level priority **L** low level priority

CASE STUDY: Reducing food waste (provided by Tesco)

Description: Tesco has committed to reducing food waste on farms, in stores and at home. The company has set targets to halve food waste from farm to fork by 2030 and made the commitment within its UK operations that no food safe for human consumption will go to waste. Tesco became the first retailer to publish food waste data across all parts of its food business. It has taken actions such as widening specifications on potatoes to help suppliers reduce waste, while removing “Best Before” dates from over 180 fruit and vegetable lines to help customers to reduce food waste at home.

Partners involved: Producers, suppliers, and customers.

Impact: There has been a 61% decrease in the amount of food waste for human consumption going to energy recovery compared to 2017/18, with a 15% reduction in total food waste compared to 2013/14. Of the surplus food that was not sold to customers, the company redistributed 36,843 tons to charities, community groups, colleagues and as animal feed, preventing it from becoming waste. This represents a 12% increase since 2018/19 and an 82% increase since 2017/18.

Barriers: One of the most significant barriers has been the lack of consistency on food waste reporting. Tesco and its largest own-brand suppliers worked in

partnership with Waste and Resources Action Programme (WRAP) to develop templates and guidance as part of the UK Food Waste Roadmap.

<https://www.tescopl.com/sustainability/product/food-waste/>



Source: Tesco

7 Scaling collaborative action towards 2030 and 2050



⑦ Scaling collaborative action towards 2030 and 2050

This Roadmap presents a range of transformational targets, action areas and business-led solutions to scale individual and collective action to deliver healthy and sustainable diets to all by 2030 and 2050. We have focused action areas on where the sector, together with partners and other food players, can maximize positive impacts while minimizing negative effects. With the understanding that concerted action is indispensable for success, this document identifies the impact opportunities for food and agriculture companies to prioritize action along the value chain.

The Roadmap is a call to action to food and agriculture value chain companies, customers and consumers of food and agriculture products, and wider stakeholder groups (such as NGOs, industry associations and governments) to come together to accelerate food

system transformation – which is critical to realizing the sector’s contribution to the SDGs and achieving the Paris Agreement.

A CATALYST FOR IMPLEMENTATION

The Healthy and Sustainable Diets chapter of the Food and Agriculture Roadmap provides further prioritization for the development of business-led solutions by food and agriculture companies, individually and collectively.

In the coming months, WBCSD’s FReSH project and its members will integrate the outcomes of this Roadmap and adapt their workplan as follows:

- Advance individual solutions identified within the Roadmap;
- Catalyze collaboration across the food and agriculture value chain and beyond to advance the collective solutions identified in the Roadmap (e.g., the Responsible Business Pledge for Better Nutrition⁴⁷ commitment-

making process will focus on opportunities for collective action linked to nutrition and the Roadmap); and

- Enhance dialogue and encourage the development of supportive actions and frameworks by key other stakeholder groups, including investors and policy-makers;

The impact opportunities identified in the Healthy and Sustainable Diets chapter of the Food and Agriculture Roadmap reinforce the need to accelerate FReSH’s work program, which focuses on positive nutrition, plant-forward foods, protein and consumer behavior change. Furthermore, FReSH leverages and actively collaborates with other programs and projects underway within WBCSD (e.g., Circular Economy, Redefining Value and Advocacy and Policy) as well as external partners to drive elements of this Roadmap forward.

Figure 3: WBCSD Value Impact Framework



ENCOURAGING PROGRESS

FReSH will continue to work with member companies on commitment mechanisms – such as the Responsible Business Pledge for Better Nutrition – in alignment with the priority action areas, to support and demonstrate leadership to achieve the food system transformations required.

These will be grounded in the work that each individual member company is already conducting by publicly reporting on its sustainability commitments and performance in accordance with internationally recognized reporting practices and standards, as well as new tracking and reporting mechanisms, such as the [Food and Agriculture Benchmark](#) being developed by the World Benchmarking Alliance.

STAKEHOLDER DIALOGUE AND ADVOCACY

WBCSD and its members will leverage the Roadmap across various engagement platforms to enhance dialogue, identify new partnerships that can help drive implementation, and promote the adoption of supportive financial and policy mechanisms.

We will strategically employ elements of the Roadmap at key milestones during 2020-2021 to highlight the importance of the progressive private sector in delivering food system transformation and help influence the policy process to create the enabling environment for positive change. These events include:

- Pre-Event in preparation for the United Nations Food Systems Summit (FSS)
- IUCN World Conservation Congress
- Convention on Biological Diversity
- UN Food Systems Summit

- 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP 26)
- Nutrition for Growth (N4G) Summit

The Roadmap will serve as a foundational element for our leadership and engagement in each of these events. We also hope that it will focus and inspire the broader private sector to take action where it counts the most.

CONTACT

You can find more information, contact details, the latest updates on progress of the Roadmap's level of implementation and further details on the business examples outlined in this Roadmap at <https://www.wbcسد.org/Programs/Food-and-Nature/Food-Land-Use/FReSH>.

Glossary

Action areas are clusters of activities coming together to deliver healthy and sustainable diets to all by 2030 and 2050. Action areas for FReSH and the Healthy and Sustainable Diets chapter of this Roadmap are: positive nutrition, plant-forward foods, protein and consumer behavior change.

FReSH (Food Reform for Sustainability and Health) is a WBCSD project developing a set of business solutions to deliver healthy and sustainable diets for all.

Fortified foods are those that have had beneficial nutrients added to them to make them healthier.

Food safety means all measures to ensure that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.⁴⁷

Plant-based food is a food coming from any part of a plant; an animal-based food is a food sourced from animals, including meat, fish and dairy products.

Plant-based product is a processed product derived from plant ingredients.

Plant protein is a protein found within a plant-based food or product.

Plant-based protein is a protein derived from plants that can be isolated and added to another product.

Reformulation is the process of altering a food or beverage product's processing or composition to improve the product's health profile or to reduce the content of harmful ingredients or nutrients.⁴⁸

Science-based targets are a set of goals developed by a business to provide it with a clear route to reduce greenhouse gas emissions that are in line with the latest climate science.⁴⁹

Solutions are recommended actions within each action area for businesses to deliver healthy and sustainable diets to all by 2030 and 2050.

Transformational targets are sector-level goals to achieve food system transformation.

Transformation pathways are overarching clusters of action areas and actions recommended for business to lead, outlined in the CEO Guide to Food System Transformation.

Endnotes

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DISCLAIMER

This report has been developed in the name of WBCSD. Like other WBCSD publications, it is the result of a collaborative effort by members of the secretariat and senior executives from member companies. A wide range of members reviewed drafts, thereby ensuring that the document broadly represents the perspective of the WBCSD membership. Input and feedback from stakeholders listed above was incorporated in a balanced way. This does not mean, however, that every member company or stakeholder agrees with every word.

ABOUT FRESH

Food Reform for Sustainability and Health (FReSH) is a WBCSD project aimed at providing healthy, enjoyable diets for all, produced responsibly within planetary boundaries through:

- A systemic approach covering health and nutrition, the environment and socio-economy;
- A theory of change starting at the consumer level, whereby changing consumer habits and diets will pull the whole food value chain.

FReSH facilitates the pre-competitive collaboration of over 30 member companies on the development of business solutions relating to healthy and sustainable diets, which is one of the four direct pathways to food system transformation laid out in the CEO Guide to Food System Transformation.

To that aim, FReSH coordinates work streams addressing four transformational goals:

- Positive Nutrition
- Protein
- Plant-based foods
- Consumer behavior change.

ABOUT WBCSD

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD \$8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995, WBCSD has been uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within the boundaries of our planet, by 2050.

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