FUTURE OF FOOD

A Lighthouse for future living, today

Context + people and market insights + emerging innovations

FOREWORD: CREATING THE FUTURE WE WANT

If we are to create a world in which 9 billion people live well within planetary boundaries, then we need to understand why we live the way we do today. We must understand the world as it is, if we are to create a more sustainable future.

The cliché is true: we live in a fast-changing world. Globally, people are both choosing, and having, to adapt their lifestyles accordingly. While no-one wants to live unsustainably, and many would like to live more sustainably, living a sustainable lifestyle isn't a priority for most people around the world. In reality, it isn't even a possibility – neither the infrastructure nor the goods and services that a sustainable lifestyle requires are available.

The normal way of approaching the sustainable lifestyles challenge is to think about it in terms of reducing material consumption. This isn't attractive for business. It's not that interesting for policy-makers either, who rely on GDP growth and tax receipts, and it's not even great for individuals, most of whom like to spend their money, or would like to have more money to spend. That is the reality of the world today. People don't tend to aspire to less.

Nonetheless, we believe that we can work within this reality – that there are huge opportunities available, for business all over the world, and for sustainable development, in designing solutions for the world as it is.

This "Future of" series from WBCSD aims to provide a perspective that helps to uncover these opportunities. We have done this by looking at the way people need and want to live around the world today, before imagining how business can help transform lifestyles for the better. Finally, we asked if these "better" lifestyles are also more sustainable?

Our aim is to provide companies with a more positive view of what lifestyles could be like in the future, encouraging new ideas about how business can offer people "better", rather than "more". A surplus of good, actionable ideas is essential to all progress – without them, we can expect nothing better than more of the same.

"WBCSD is committed to creating a sustainable world – one where 9 billion people can live well, within planetary boundaries. This won't be achieved through technology alone – it is going to involve changing the way we live. And that's a good thing – human history is an endless journey of change for the better. Forward-looking companies are exploring how we can make sustainable living both possible and desirable, creating solutions in line with people's aspirations. With these companies, we're seeking to understand how we can leverage what is already technologically possible to make human life better, rather than bigger. We believe that sketching out a vision of a different future is the first step to creating a different path for all to follow."

Peter Bakker
President and CEO
WBCSD

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This Guide has been produced in collaboration with PwC USA.
For further information, please contact Julian Hill-Landolt

INTRODUCTION

Essential background reading: Understanding the power of this Research and Lighthouse

THE SUSTAINABLE LIFESTYLES CHALLENGE

Living well (beyond our means)

As a global population, we place greater demands on the earth's systems than it can supply, straining both the environment and our social structures. We're living well, but well beyond our means.

Much of this demand is driven by the lifestyles, activities and consumption of the global middle class. As incomes rise, so do impacts because income provides access to similar things – a bigger home, a richer diet, personal transport and more disposable income. These also happen to be the things that people, all around the world, aspire to.

Currently, some 140 million people are entering the middle class each year. They are all aspiring to, and expect, the lifestyles that the middle class currently enjoys. This is great for business in the short term, but we know that it is not sustainable, environmentally or socially.

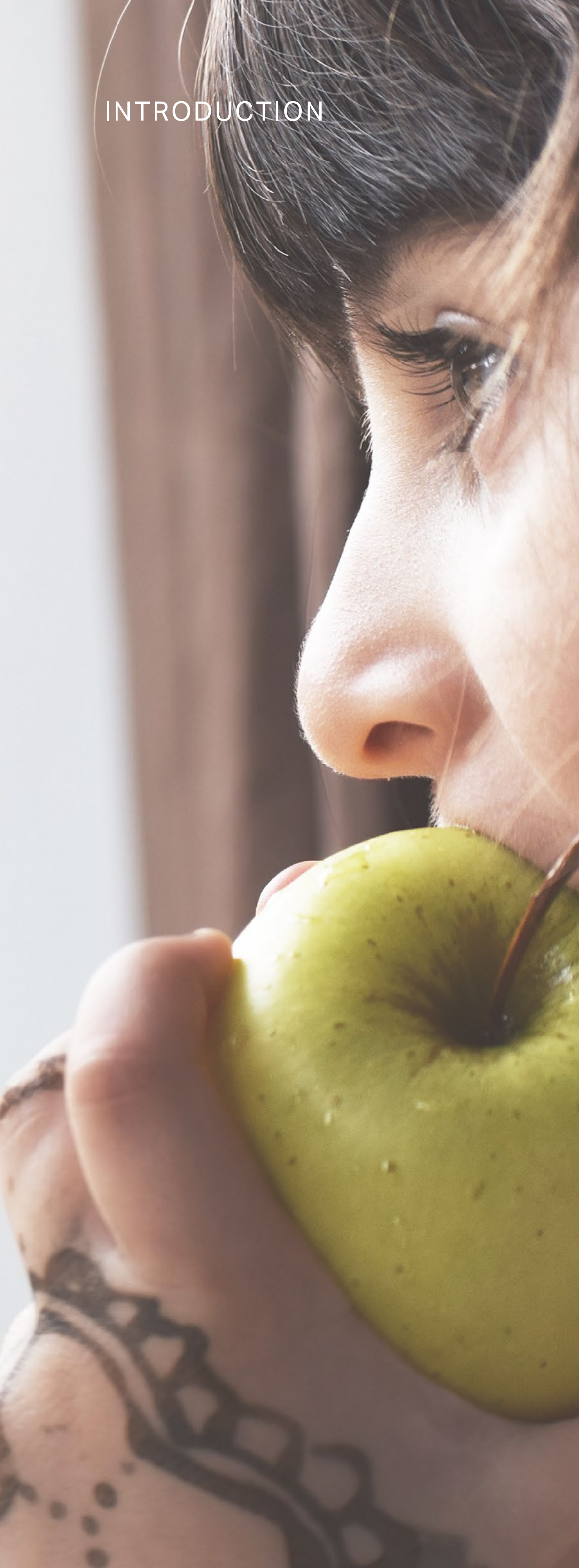
People have a right to aspire to a higher quality of life. The question is therefore how we can offer this quality of life to people but with a fraction of the impacts, in an aspirational way. How do we make Sustainable Lifestyles both possible, and desirable?

The problem with "Sustainable Lifestyles"

We haven't done a very good job of offering people appealing sustainable lifestyles to date. One reason is that sustainable lifestyles are complicated. Consumption impacts don't occur in isolation. They occur as people live their lives: eating a meal, visiting relatives, doing the shopping, taking a shower, reading a book. As a result, no single company can create a sustainable lifestyle on its own. Systemic solutions are required; ones that extend up and down a given value chain and that apply across our varied lifestyle activities.

But the other reason is that we have tended to forget that people actually have to live with the solutions we propose. Traditional solution design involves identifying the impacts and suggesting a fix to reduce them: live in a smaller home; don't drive; stop eating meat. It is very hard to persuade someone that they should aspire to less – that they shouldn't want "the Good Life".

What if we instead think about how we can offer lifestyles that people need and desire, and then work out how to make them better (and sustainable)? Wouldn't that make it easier to encourage change, with our customers and within our companies?



WBCSD SUSTAINABLE LIFESTYLES

Making sustainable lifestyles possible, and desirable

WBCSD has a long track record of working with companies to help them address sustainability challenges in ways that make sense for business. When it comes to sustainable lifestyles, business focus cannot be on people not spending their money. Business must focus on how to maintain a healthy economy and help people spend their money in the best way. Instead, business must ask how it can make sustainable lifestyles both possible (innovation) and desirable (marketing).

The importance of aspirations

We have known for a long time that "more" doesn't lead to happiness. In fact, there are significant financial and social costs to the lifestyles that we have been trying to lead. Around the world, we see people beginning to question these costs – wanting to know more about where their food comes from, questioning the health implications of their diet, downsizing rather than upsizing. They are redefining what it means to live well – away from Good Life 1.0 notions of bigger, faster, more, and towards a new Good Life 2.0 which is smarter, cleaner, healthier.

WBCSD explored the emergence of The Good Life 2.0, publishing the findings in its Good Life 2.0 Playbook. It presents the aspirations appearing in society that celebrate a world in which people aspire to lifestyles that are better rather than bigger, but without trade-offs or settling for less.

The Playbook inspires companies to explore how they can make the Good Life 2.0 desirable, but they also want guidance on how to make The Good Life 2.0 possible. At the moment, companies aren't clear on what the Good Life 2.0 should look like in practice – so how can we expect them to create it?

WHY THIS LIGHTHOUSE WORK IS NEEDED

We believe that we need a shared vision of what it means to live well – a more positive view of what lifestyles could be like in the future. That's why we have created this human-centric lighthouse, a simple, shared, high-level vision that inspires and guides us to uncover new opportunities in pursuit of aspirational (sustainable) lifestyles.

This "Future of Food" research provides companies with a snapshot of how their customers are living today in order to create a shared vision of how they would like to live well in the future.

By understanding the world as it is today, we can explore what customers need and expect, and offer guidance to companies on how to provide this to them in a sustainable way. We hope that the research, together with the Lighthouse, will help to reveal the products, services and business models that need to be made available and accessible if companies are going to innovate this new Good Life 2.0 into existence.

A LIGHTHOUSE

The best imaginable future of food that leads to a happier, healthier (& more sustainable) lifestyle

An inspiring people-centric vision of a (sustainable) lifestyle that:

1. highlights people's needs and wants from their lifestyles (today, tomorrow, in 5 years, in 15 years), and
2. identifies spaces in which innovation needs to occur to be able to deliver this vision.

Use this research and Future of Food Lighthouse as a foundation for conversations with colleagues in R&D, Innovation, Insights, Marketing, Brand Strategy, and explore:

- a shared (customer-centric) positive vision of the future that your company can play a role in creating
- the areas where your company can begin adding value towards this vision today
- future potential innovation opportunity areas in support of this vision
- evidence of where your company will require support for its innovations to scale and where you must therefore collaborate
- how you can demonstrate to all of your colleagues how your company can meaningfully and profitably support pathways towards the Good Life 2.0.

OUR APPROACH TO THE RESEARCH

How we uncovered our vision, and where it applies

We need to present an updated aspirational global lifestyle.
To get to a shared vision of sustainable lifestyles, we knew we needed a shared understanding of today's realities and trends; a shared sense of what people increasingly want and how those desires are showing up in the marketplace; and a preview of the innovations that are emerging to further shape and deliver on them. From there, we can explore how to offer people what they need, want and expect, but in a more sustainable way.

The research is intended to be global, with a focus on the emerging (urban) middle class – after all, it is these higher income lifestyles that drive aspirations globally. Where possible, we sought out data for countries with the largest growing middle class* and on track to be most populous by 2050. Our research includes, but is not limited to India, China, U.S., Indonesia, Brazil and Mexico – and, as is unavoidable today, much of the focus is on millennials, given their cultural influence and runway for behavior change.

Two realities skewed our research towards a U.S. perspective: First, we recognize that Western aspirations and practices, which the U.S. projects further than any other place, tend to be adopted elsewhere. Second, reliable public data on trends related to food, home and mobility is not widely available, but there is a good selection of quantitative research focused on the U.S.A.

The research provides a snapshot of how the middle class are living today, all around the world, and a shared vision of the types of inspirational (and sustainable) lifestyles that they are aspiring to.

This insight has been used to create the "Future of Food" Lighthouse – a vision of the role of food within lifestyles that are aspirational, inspirational and just so happen to be more sustainable. It is supposed to be timely, and yet timeless rather than revelatory or exhaustive. It's there to help you reach your own "a-ha" moments as you explore the research.

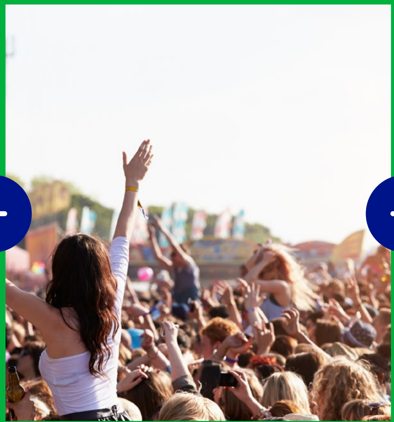
*** measures of what constitutes middle class vary significantly by country**

OUR RESEARCH & LIGHTHOUSE CREATION PROCESS

Understanding
the context for the future

What are the macro trends, realities & shifts that serve as the backdrop for the future of food?

Uncovering
people and market insights



How are people's preferences changing, and how are these changes showing up in the marketplace?

Identifying
emerging innovations

What are the emerging innovations that have the potential to change how we live, for the better?

Exploring
elements of the Good Life

What do people need their food to do or be in order to live well? What do people want to feel?

What is the best imaginable future of food that leads to a happier, healthier (& more sustainable) lifestyle?

WHAT DID WE EXPLORE TO INFORM OUR FOOD LIGHTHOUSE?

CONTEXT

Macro trends, shifts and realities

Demand is driving ever-increasing environmental, social and economic pressures

- Demand is rising
- Environmental pressure
- Human rights
- Economic strain on farms

Many of us have an unhealthy relationship with our food

- Food loss and waste
- Rising obesity and persistent malnutrition
- Chronic diseases and allergies
- Rising cost of food-related health issues
- Healthy eating policies

PEOPLE AND MARKET INSIGHTS

People's evolving needs and desires – and how they're showing up in the marketplace

- Evolution of food budgets
- Diverging attitudes to food
- Health as the ultimate wealth
- Rise in vegetarianism and veganism
- Dietary restrictions + avoided ingredients
- Trust and (meaningful) transparency in modern agriculture
- Demand for 'real, natural, organic, local, slow'
- Small batch alcohol
- How and where people eat
- Convenience and shopping
- Home cooking as a source of joy and pride
- Eating as a social experience

EMERGING INNOVATIONS

What's underway in transforming the future

- Personalized diets, nutrition and meal planning
- Urban farms
- Community vegetable gardens
- Alternative proteins
- The war on waste (packaging)
- The war on waste (pop culture and sharing)
- Blockchain and consumer information
- Technology and food shopping
- Smart, mindful, automated kitchens of the future

A LIGHTHOUSE FOR THE FUTURE OF FOOD

LIGHTHOUSE VISION The Meaning of Food	**Food to Nourish** Mind, body & spirit for longevity, vitality and joy
WHAT THIS MEANS For a Person's Life	**What This Means, For a Person's Life** **Connect** to ourselves, others and nature through our food **Trust** how everything is grown, produced and delivered Have the information to **make easy decisions**, but also cook well & stay curious! **Celebrate** culture, family and friends
WHAT THIS MEANS Practically	**What This Means, Practically** We understand the nourishment we (personally) need to live long, healthy lives. Everyone has access to a balanced diet that is affordable, safe, healthy and tasty. Better transparency and tools make it easier to discover, plan and create meals, facilitating the purchase, preparation and disposal of food. Nothing is wasted. All the people involved in getting food to us are provided with a living wage and good working conditions. Our food is free of cruelty and is sustainably produced.
INNOVATION SPACES	**Growing:** **Soil** health, ecological diversity and conservation agriculture; Agriculture for **improved nutrition**; **Local** food ecosystems, incl. community and at home; **Vertical** farming **Producing + Packaging + Distributing:** Alternative **proteins**; Formulating +reformulating for **wellbeing** and **safety**; Smart **packaging**; Quicker **distribution** to customer, incl. omni-channel **Planning + Shopping + Experiencing Food:** **Personalized diet** planning; Radical product-level **transparency and trust**; Frictionless **shopping** experience that still supports discovery: in-store, online, and in between; Better **meal planning, preparation + disposal**
WHAT MUST BE TRUE	Zero waste; Regenerative; Resilient; Safe & secure; Within planetary boundaries; Inclusive & equitable; Shared; Fair labor
ENABLERS	Policies & incentives (financial & non-financial); Promoting new aspirational behaviors

DECODING THE LIGHTHOUSE

LIGHTHOUSE VISION
The Meaning of Food

This is the ultimate vision of what our food represents for us in The Good Life 2.0. It is the big (re)frame.

What This Means, For a Person's Life

WHAT THIS MEANS
For a Person's Life

These are the key components that make up the Lighthouse Vision – the highest aspirations for what we want food to be and do for us. They are drawn from an understanding of how people ultimately want to feel as well as from an investigation into evolving aspirations.

What This Means, Practically

WHAT THIS MEANS
Practically

This is the next level of depth behind those human aspirations – what it would take to deliver the above components successfully in a sustainable way. It's an attempt to translate how they would play out in an interconnected world.

Growing | Producing + Packaging + Distributing | Planning + Shopping + Experiencing Food

INNOVATION SPACES

These are the spaces in which innovation needs to occur to be able to deliver on the vision, inspired by an understanding of real pain points in peoples' lives. They are intentionally broad, but reveal where companies can already generate value today, as well as the areas where they will need partners to develop integrated solutions.

WHAT MUST BE TRUE

ENABLERS

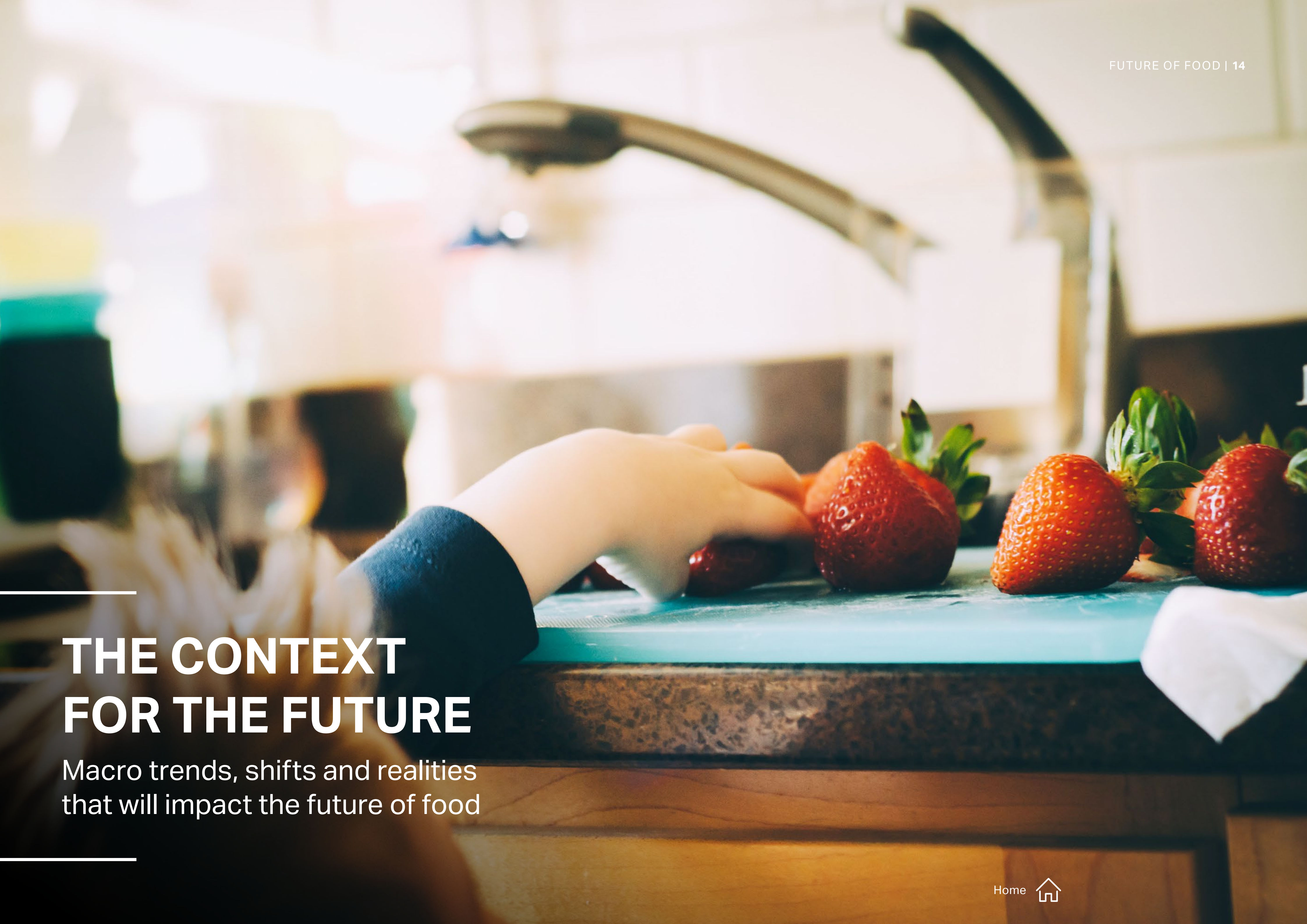
This covers what absolutely must be true, i.e. what needs to be solved in the innovations and embedded in the design of new infrastructure, products, services and value chains (e.g. operate within Planetary Boundaries), and it highlights the enablers that are so critical to scale.

IN SUPPORT OF OUR FReSH WORK, REFORMING AND TRANSFORMING THE FOOD SYSTEM

Our **Food Reform for Sustainability and Health (FReSH)** Project has brought together one of our largest coalitions to tackle the challenges within the food system, from fork to farm. According to FReSH, fixing this system that currently suffers several points of failure, will require full-scale transformation: "we need to provide healthy, enjoyable diet for all while contributing to socioeconomic development and minimizing (and eventually eliminating) environmental impacts and waste."

This **Future of Food Research and Lighthouse** supports the work of the FReSH project. The unique approach of the Sustainable Lifestyles work is to look at food-related challenges using the individual, rather than the system, as the starting point.

This work is designed to provide companies with a view of the food landscape that is both positive and customer-centric. It offers a complementary perspective that helps to reveal the exciting opportunities that exist in driving future reform and transformation of global food systems.



THE CONTEXT FOR THE FUTURE

Macro trends, shifts and realities that will impact the future of food

DEMAND IS DRIVING EVER-INCREASING ENVIRONMENTAL, SOCIAL AND ECONOMIC PRESSURES

The World's population is rapidly growing and more people are joining the middle class. As a result food demands are expected to increase by as much as **98%** by 2050.

Agriculture already accounts for 1/3 of land use (with 40% of agricultural soil degraded), over 10% of greenhouse gas emissions, and is contributing to water scarcity globally. The increased supply required to feed the ever-bigger, ever-richer global population could lead to the loss of one million square miles of tropical forest as well as significantly increased greenhouse gas emissions and water demands in already water-scarce regions.

Modern agriculture also results in social challenges around the world, including some serious human rights violations (e.g. forced labor), a wide range of health and safety issues, and an increasingly difficult economic environment for all but the most successful farms.

DEMAND FOR FOOD IS RISING

Population growth

The current world population of 7.3 billion is expected to reach 8.5 billion by 2030, 9.7 billion by 2050.[1]

Global middle class

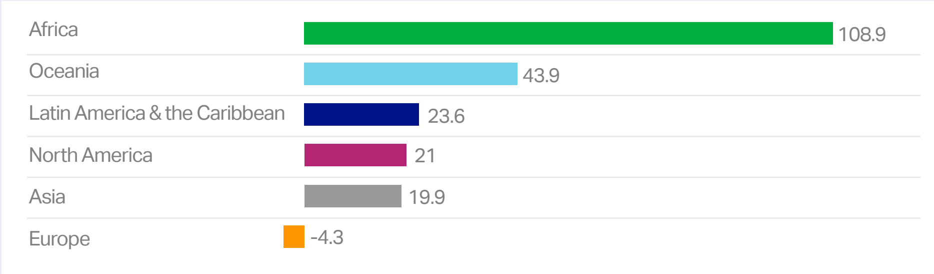
In 2015, the global middle class was about 3 billion people and accounted for 60% of consumer spending. By 2021, the middle class could surpass 4 billion, making it a majority of the world's population. According to International Monetary Fund (IMF) economic growth forecasts, China and India could add 1.5 billion people to the middle class by 2020. Brazil, Mexico, Pakistan, Indonesia, and, a few years later, Egypt, Nigeria, and Vietnam could each have middle classes larger than 100 million people.[3]

Demand

As the purchasing power of these middle class households rises, their food consumption patterns will shift beyond basic staples. Overall food demand is expected to increase anywhere between 59% to 98% by 2050.[2]

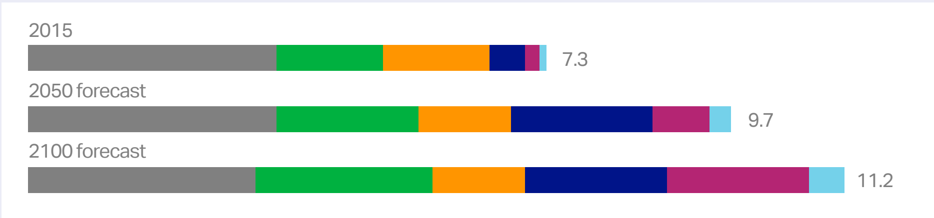
The World's Population

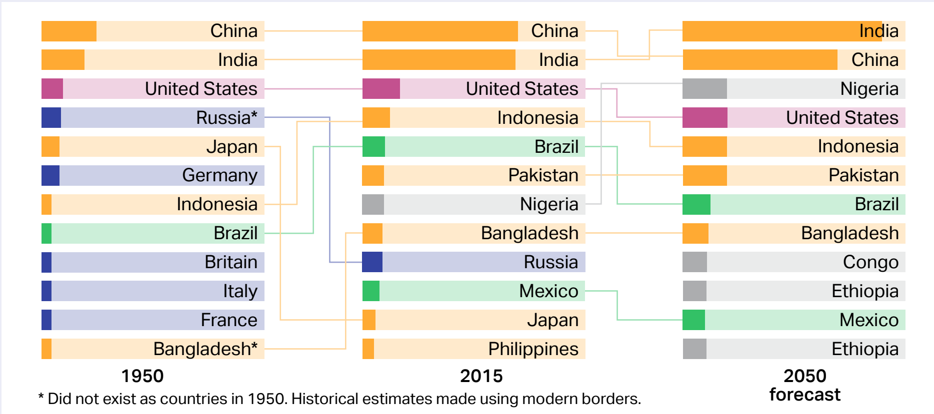
Regional % change, 2015-50 forecast



Total population

Billion





Source: Graph and data form Economist

1 "Global population forecasts", Economist, 2015
2 "Global Demand for Food Is Rising. Can We Meet It?" HBR, 2016
3 "How a Growing Global Middle Class Could Save the World's Economy", Pew Trusts, 2016

INCREASED FOOD PRODUCTION IS PUTTING PRESSURE ON THE ENVIRONMENT

Agricultural output

2x increase in crop production is required to feed the emerging middle class in developing countries.[1]

Land competition

1/3 of all usable land is devoted to agriculture (70% of which is used for animal grazing or to grow feed crops). Agriculture is one of the biggest contributors of greenhouse gas emissions.[1]

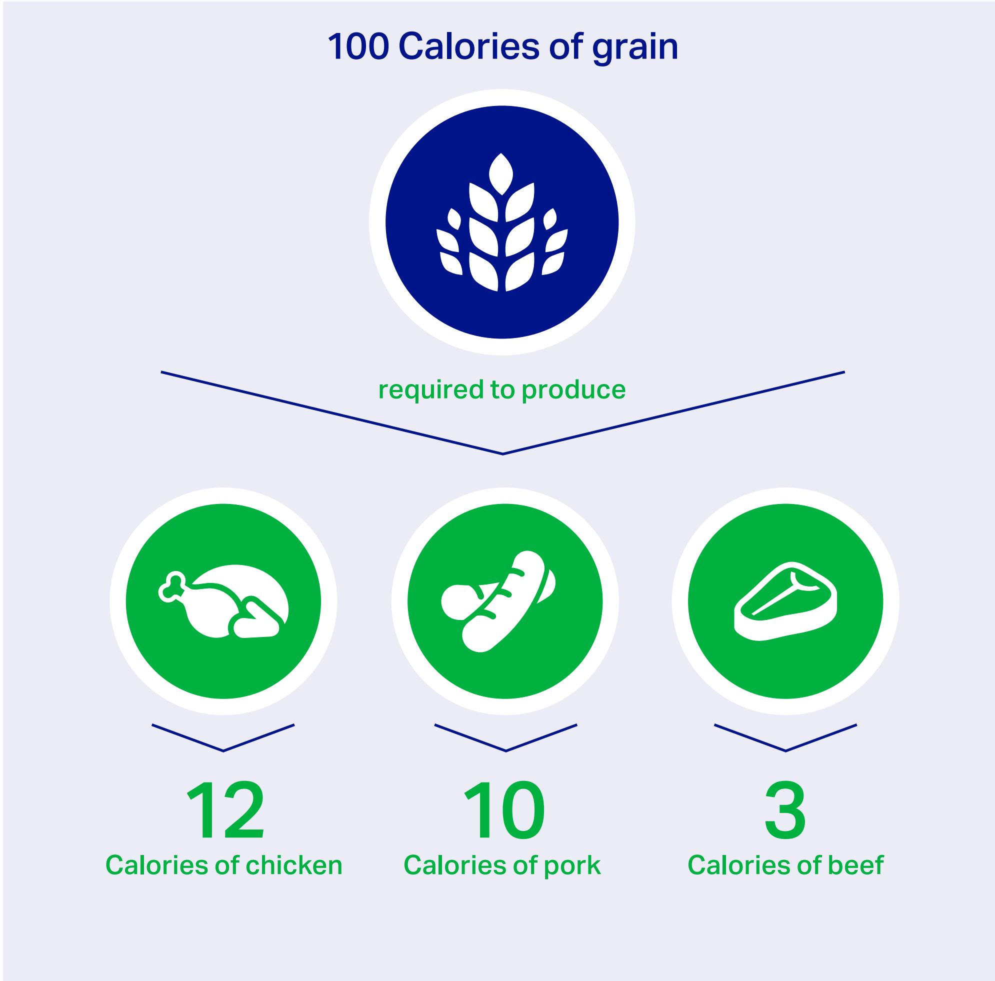
1 million square miles of tropical forest land could be lost by 2050 due to demand for additional farmland – and there will be increased competition for use for human food, animal food and biofuels.[1]

Water scarcity

19% increase in global irrigational water demand by 2050.[2]

69% of freshwater withdrawal is for agriculture use, contributing 30% of all freshwater pollution.[2]

5 billion people will live in areas where fresh water supply is under pressure by 2050.[2]



[1] "A Five-Step Plan to Feed the World", National Geographic, 2014
[2] "Global Water Under Increasing Pressure", World Water Assessment Programme

AND ON HUMAN RIGHTS IN FOOD SUPPLY CHAINS

Risks associated with agriculture and seafood production include:

- **Health and safety of workers** and local communities given the use of chemicals, machinery, the working environment (esp. deep sea fisheries) and communicable diseases.[1]
- **Forced labor, including child labor** 60% of all child labor worldwide is in the agricultural sector.
- **Impact on communities** and traditional livelihoods due to a range of factors, including monoculture, commercial/large scale fishing, over fishing, land use for cash crops, volume of water use and the impact of effluent and farm waste.
- **Forced resettlement** of communities, including indigenous peoples.

Example supply chains where these issues are common:

Thai Seafood

Despite widespread public backlash and potential bans on imports from the country, efforts to reduce the level of human rights abuses have done little to curb the amount of slavery, human trafficking, murder and corruption.[2]

Mexican produce

Issues of labor abuses on Mexican farms range from forced labor, poor working conditions (rat-infested camps), wages being withheld and threats against laborers if they try to leave.[3]

1 "Human Rights Guidance Tool", UNEP
2 "Slavery and trafficking continue in Thai fishing industry, claim activists", The Guardian, 2016
3 "Hardship on Mexico's farms, a bounty for U.S. tables", Los Angeles Times, 2014

FARMS ALSO FACE ECONOMIC PRESSURES IN DEVELOPING AND DEVELOPED MARKETS ALIKE

Rising production costs

Rent prices for farmland have nearly doubled since the mid-2000s; the cost of fertilizer was 7x higher in 2010 as compared to 1960; and the price of soybean and corn seed, despite subsidies, more than doubled between 2001-2009. Although demand and prices for commodity crops have increased significantly, farmers are having a harder time just breaking even given the rising production costs.[1]

Workforce shortage

A Farm Bureau report estimated that the proposed enforcement-only approach that leaves almost no undocumented workers in the economy would raise food prices 5%-6%. It also predicted smaller supplies of products, which means that American farms could produce 15%-31% fewer vegetables, 30%-61% less fruit, and 13%-27% less red meat.[2]

Although some farms are offering raises and new perks, native-born Americans have not been tempted to leave their jobs for the fields. Nine in ten agriculture workers in California are still foreign-born, and more than half are undocumented according to a recent federal survey.[3]

Food shortage

In 2016, the Wall Street Journal reported that the drop in laborers has led to a 9.5% annual decline in fruit and vegetable production in the U.S., or a loss of $3.1 billion per year.[2]

[1] "Why Commodity Farming Is a Tough Row to Hoe", Mother Jones, 2013
[2] "A Donald Trump presidency could lead to food shortages in the US", Quartz, 2016
[3] "Wages rise on California farms. Americans still don't want the job", LA Times, 2017

Family farms under pressure

Although food prices in the U.S. have fallen over the past century, key agriculture inputs for food production such as land, fertilizer, seeds and labor have all been steadily increasing.

This is putting a growing strain on family farms already operating at zero long-run profitability. Compounded by increasing weather variations and a reduced farm workforce due to immigration reform, farmers across the U.S. are struggling to maintain production levels – and, ultimately, avoid food shortages.

MANY OF US HAVE AN UNHEALTHY RELATIONSHIP WITH OUR FOOD

Food shortages are declining but 1/3 of food produced is still lost or wasted, while 800 million people are undernourished and food insecurity regularly generates civil unrest. Meanwhile, over-nourishment now significantly exceeds undernourishment, with 2 billion adults overweight worldwide, leading to increased healthcare costs and a rise in non-communicable diseases in both the developing and developed world.

Increasingly, calories are coming from highly processed foods which, combined with poor diets, are contributing to chronic diseases and other health impacts. In the U.S. this has led to as much 50% of the population having a diet related disease.

The health impacts of poor diets are driving policy changes around the world with fat and sugar taxes being contemplated in some places and increased guidance around diets and nutritional content implemented in others.

WE ARE PRODUCING MORE FOOD THAN EVER, BUT WASTING A THIRD OF IT

1/3 of all food* produced in the world intended for human consumption is lost or wasted, equivalent to economic losses of $940 billion per year.[1, 2]

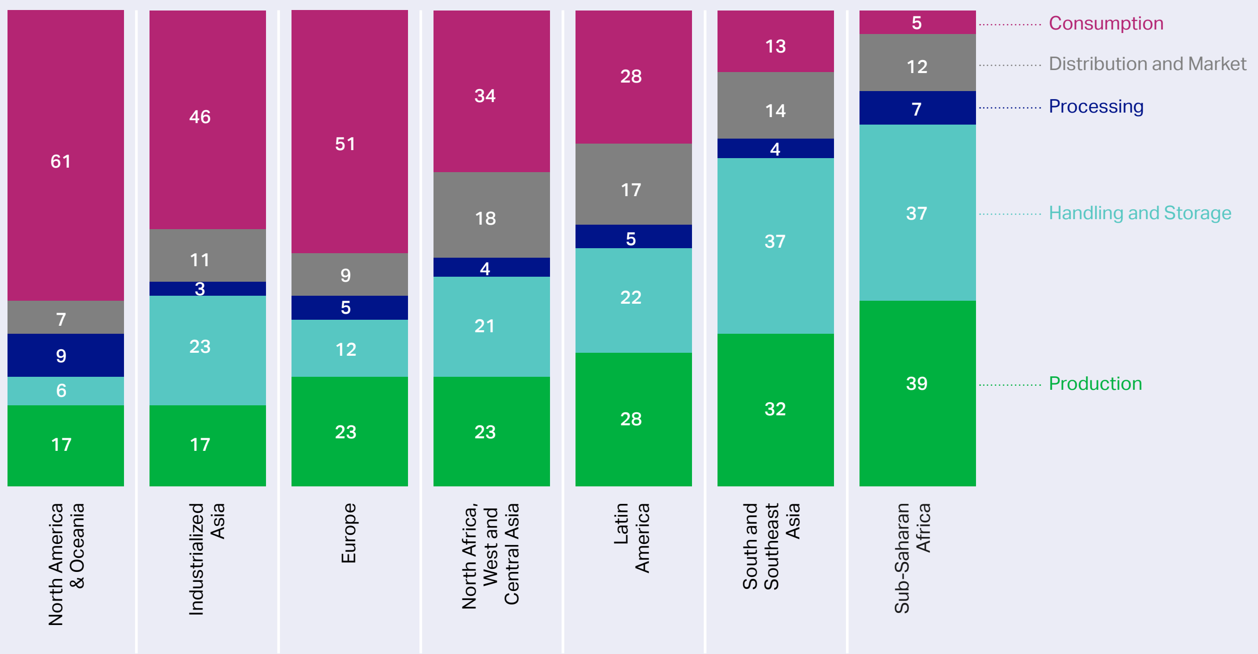
Food waste in developed regions is largely consumer-driven, whereas most waste in developing regions occurs near production – before it reaches the end-consumer.[2]

* One-third as measured by weight; "food loss and waste" refers to food intended to be eaten by people that leaves the food supply chain somewhere between farm and fork

[1] Global Food Losses and Waste, FAO, 2011

[2] The Business Case for reducing Food Loss and Waste, WRI, 2017

Percent of total kcal lost or wasted per region (2009)



Share of total food available that is lost or wasted

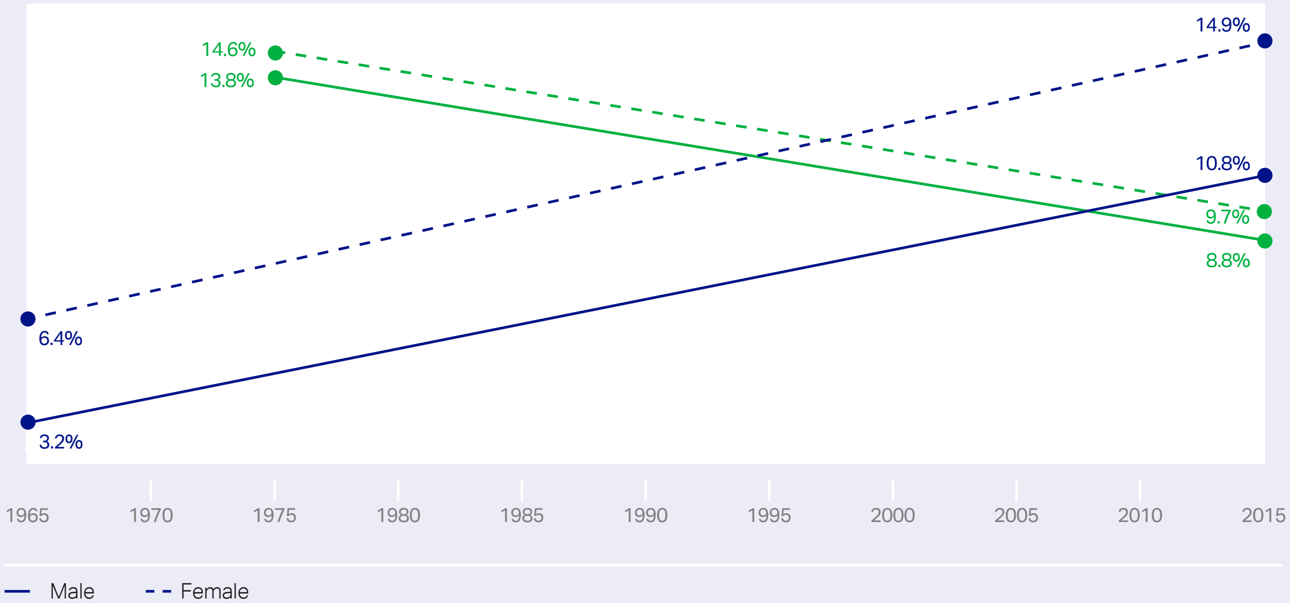
North America & Oceania	Industrialized Asia	Europe	North Africa, West and Central Asia	Latin America	South and Southeast Asia	Sub-Saharan Africa
42%	25%	22%	19%	15%	17%	23%

AT THE SAME TIME, OBESITY HAS OVERTAKEN MALNUTRITION

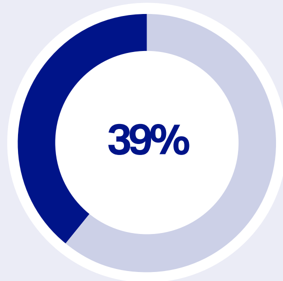
Global overeating has become a bigger problem than hunger, with more people now obese than underweight.[3]

The prevalence of **underweight** people has dropped since 1975...

...while global **obesity** has tripled since 1965[1]



Malnutrition* though declining, is still a reality.[2, 4]



of adults are overweight, or 71% in the U.S.[3, 4]

1 in 8

people worldwide don't get to eat enough[5]

2 billion

people in the world suffer from various forms of malnutrition[2]

*** includes undernutrition as well as micronutrient deficiencies which result in health issues, e.g. anemia, stunted brain development**

1 "Food Sustainability Index", Barilla Center for Food & Nutrition, 2016 (chart above, and all data)
2 GAIN referencing "The State of Food Insecurity in the World", FAO, 2011
3 "Obesity and overweight", WHO, 2016 (adults age 18 and older in 2014)
4 "Obesity and overweight", CDC, 2016 (adults age 20 and older in 2015)
5 "1 in 8 Suffers from Chronic Hunger Globally, UN Report says", NPR, 2013

CHRONIC DISEASES AND ALLERGIES ARE ON THE RISE

74%

of deaths globally are expected to be due to chronic disease* by 2030, up from 63% in 2008 and 68% in 2015.[2] These diseases are the leading cause of death and disability worldwide today. Medical experts believe them to be largely preventable, making the need for behavior modification – eating and diet in particular – widely recognized.[3]

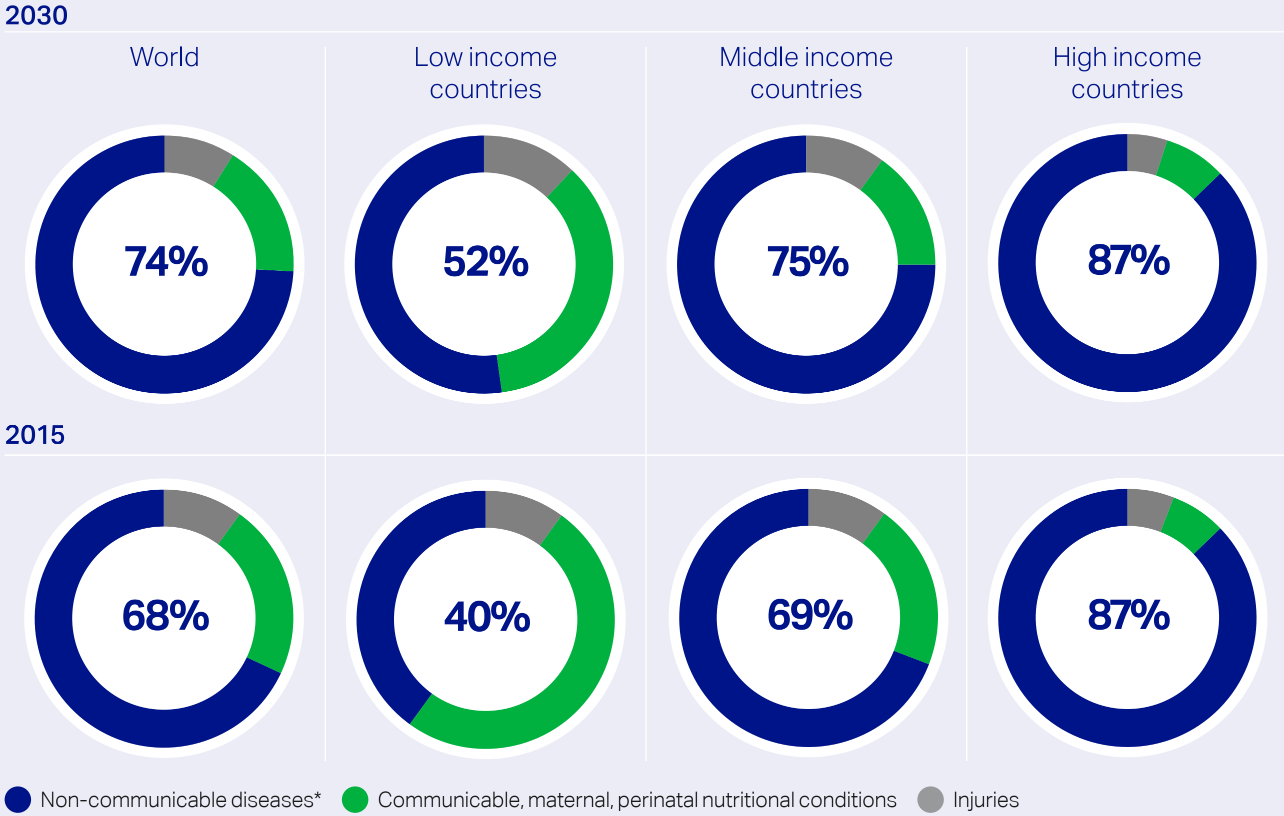
$30+ trillion

expected cost of chronic diseases globally** between 2011-2030, representing ~48% of global GDP in 2010.[3]

50%

increase in food allergies among children in the U.S. in just one decade (1997-2011), with food allergy rates rising in developed countries worldwide.[1]

Chronic Non-communicable Diseases
as leading cause of death globally (% deaths)



Data from: World Health Organization, Projections of Mortality and Causes of Death, 2015 and 2030 (latest)

*** Include cardiovascular disease, Type 2 diabetes, cancer, respiratory diseases**
****Does not include mental health conditions which are expected to account for the loss of an additional US$16.1 trillion over this time span**

1 "What's in our food and on our mind", Nielsen, 2016
2 "The Global Economic Burden of Non-communicable Diseases", WEF, 2011
3 "Trends in Allergic Conditions", Centers for Disease Control & Prevention, 2013

THE IMPACT OF FOOD ON OUR HEALTH IS INCREASINGLY CLEAR

About 50% of all Americans have one or more diet-related chronic disease, including cardiovascular disease, high blood pressure, type 2 diabetes, some cancers, poor bone health, and overweight/obesity.[1]

More than 50% of all calories consumed in the U.S. come from "ultra-processed" foods, which are high in added sugars, sodium and saturated fat.[2] Numerous studies have indicated that consumption of these ultra-processed foods increase the risk and incidence of obesity and other diet-related chronic diseases.[3, 4]

In the U.S., the leading diet-related chronic diseases are estimated to cost the economy over $1 trillion in direct medical costs and indirect costs (e.g. productivity loss).[5]

Disease	Cost (in billions $)*
Cardiovascular	$320.10
Cancer	$216.60
Diabetes	$245.00
Obesity	$210.00
Osteoporosis	$19.00
Total	**$1,010.70**

*** These numbers are not conclusive, as they come from different online, albeit reliable, sources that used different methodologies to calculate their estimates, and reflect different time frames.**

1 "Dietary Guidelines For Americans, 2015 – 2020, Eight Edition", Health.gov, 2015
2 "Ultra-processed foods a huge chunk of American diet", CBS News, 2016
3 "Consumption of ultra-processed foods and likely impact on human health – Brazil", Public Health Nutrition, 2012
4 "Consumption of ultra-processed foods and likely impact on human health – Canada", Public Health Nutrition, 2012
5 "Diet-Related Illnesses Cost U.S. Economy $1 Trillion Annually", Down to Earth, 2016

POLICIES ARE EMERGING TO ENCOURAGE HEALTHIER EATING

Sugar-sweetened beverage tax

Mexico, South Africa and cities across the U.S., including Philadelphia, Boulder, Seattle, and San Francisco, have introduced taxes on sugary beverages in hopes of addressing obesity and diabetes. The tax in Mexico led to a 5.5% drop in sugary-drink purchases in the first year, followed by a 9.7% decline in the second year – averaging a 7.6% decrease overall.[1, 2]

Calorie information menu labeling

In November 2015, U.S. Food and Drug Administration (FDA) released sweeping final rules requiring that calorie information be posted on menus, menu boards, and vending machines. Although less than half of consumers (38%) report noticing the calorie information, this rule has encouraged large chain restaurants to reduce the calories in their new menu items by 60 calories (12%).[5]

Vending machine standards

The city of Glendale, California voted to replace chips and sodas in vending machines with healthier snacks, such as fruits, vegetables, and nuts.[6]

Fatty-food tax

Since 2011, Hungarians have had to pay an extra tax on fatty foods plus higher tariffs on soda and alcohol. The annual proceeds of around $78 million go toward state health care costs, including those associated with addressing the country's 18.8% obesity rate, which is more than 3% higher than the European Union average of 15.5%.[4]

Mandated dieting classes

In 2008, Japan passed a law designed to combat metabolic syndrome (pre-diabetes) The "Metabo Law" requires overweight individuals to go to dieting classes, otherwise, their workplaces, or the local governments of the areas in which they live, must pay fines to the federal government.[3]

1 "Mexico's sugar tax leads to fall in consumption for second year running", The Guardian, 2017
2 "UK to charge soda tax on sugary drinks", CNN, 2016
3 "Big Government, Small Bellies: What Japan Can Teach Us About Fighting Fat", The Atlantic, 20126
4 "Battling the Couch Potatoes: Hungary Introduces 'Fat Tax'", ABC, 2011
5 "Indirect Effects From Menu Labeling Can Improve The Public's Health", Health Affairs, 2015
6 "Glendale to stock all vending machines at parks and other facilities with healthful snacks", LA Times, 2016

TAKEAWAYS

Challenges

When we think of challenges in the food system from a sustainability perspective, we understand the stark environmental aspects quite well: agriculture is estimated to be the driver of around 80% of deforestation and 70% of freshwater resource usage worldwide[1]. As food demand grows, driven by population numbers and the expanding middle class, this impact will increase.

But the challenges in the food system go beyond soil quality, excessive fertilizer, land use and water availability. For instance:

- We need to take into account agriculture's vital role as an employer. Despite steep declines, over a quarter of the world's population (43% in 1991 to about 26% today) still work in the food system.
- How much of the food they produce gets thrown away, by whom and when, adds another layer of complexity. To what extent do our agricultural practices, supply chains, retail norms, policies and behaviors contribute to unnecessary food loss and waste?
- What and how much we eat affects our health in ways that directly impact our own wellbeing and that of the economies we live in.

Where can business play a role in addressing some of these environmental, social and economic challenges?

Opportunities to consider

↗ Agricultural workers play a significant part in the world economy both as producers and as economic actors in their own right. They are being squeezed by increasing input costs, competition for land, and in many markets, falling or unstable prices for their products.

↗ However, as later sections will show, customers are increasingly interested in where their food comes from. Companies can support the health of local ecosystems, including soil and biodiversity, but also community health. While additional efficiencies in food production may be found, it is vital that farming remains an attractive and viable industry, in both wellbeing and financial terms, for farm workers and the communities they live in. After all, they are the ones responsible for the management and maintenance of healthy land that we are all existentially reliant on.

↗ One of the reasons that customers are interested in where their food comes from, is because people are again taking notice of the links between food quality, diet and health (and, possibly, the environment). However, we need to be wary of the extent to which we market to these interests. Solutions need to be scalable. In order to offer people a sustainable aspirational future of food, we need to ensure that it's available for all.

[1] "FReSH: Consumption and Behavior Trends", WBCSD, 2018

PEOPLE AND MARKET INSIGHTS

People's changing preferences and how they're showing up in the marketplace

OUR CONNECTIONS WITH FOOD ARE CHANGING

As people join the middle class, the proportion of their income that they spend on food declines. They are able to exercise more choice in the types of foods they buy. We see attitudes towards food changing: what we buy, where we buy it, where we eat it and how we cook it. Sadly, income growth also seems to lead to more food waste.

For some, food is about convenience and speed, with rapid growth seen in meal replacements, eating on the go and food deliveries. For others, it is a source of identity and pride or part of a healthy lifestyle, reflected both in restaurants and in cooking at home. Interest in links between personal health and diet have led to increasingly intense scrutiny of ingredients.

Trust in modern agriculture is very low, driving people to seek greater transparency and find alternatives to newly scrutinized ingredients and modern global agriculture, for instance "organic", "buying local" and "Slow Food". In rich economies, smaller scale food and drink producers are seeing significant market growth, e.g. the explosion in the craft beer market, and the disruption of large scale incumbents.

"It's hard to predict the future of food in a world that is changing faster and faster. Because economic instability, ecological fragility and the arrival of highly disruptive technologies make that exercise an increasingly arduous one. However, it is possible, by observing the evolution of dietary habits of the generations now entering adulthood, to interpret a few signs that speak for themselves."

Pascale Hebel,
Director of the Consumer and Corporate Division at CREDOC*

CREDOC = Centre de Recherche pour l'Étude et l'Observation des Conditions de Vie, or the Research Centre for the Study and Monitoring of Living Standards

FOOD BUDGETS AROUND THE WORLD HAVE BEEN EVOLVING

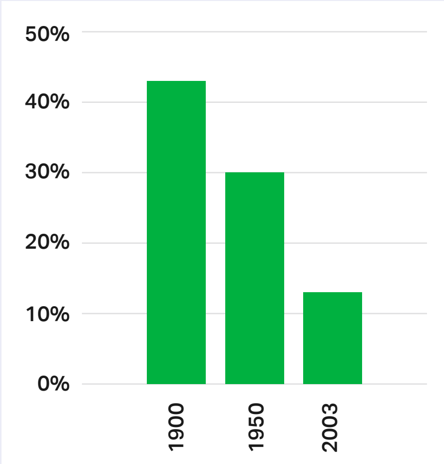
Over the past 100 years, food production in the U.S. has become more efficient and less expensive compared to wages, and the share of the family budget spent on food has declined from 43% in 1900 to just 13% in 2003.[1]

Globally, however, food accounts for a much higher percentage of annual expenditures than the U.S. with Indonesian and Indian households spending nearly 40% and 30%, respectively, on food and (non-alcoholic) beverages.[2]

The low cost of food in the U.S. is in part due to the government aid to farmers (currently approximately $25 billion per year) that helps subsidize and insure commodity crops like corn and soy. Those priorities are reflected at the grocery store, where the price of fresh food has risen steadily while the cost of sugary treats has dropped.[3]

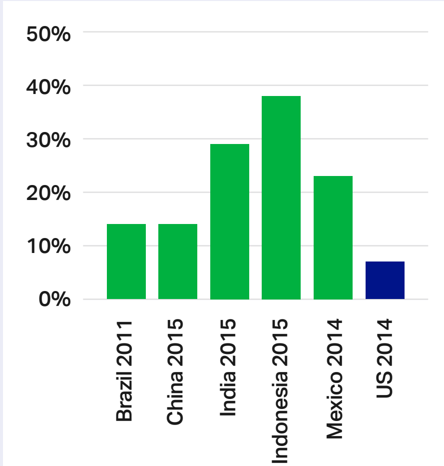
Unfortunately, the overall drop in the relative cost of food is also directly linked to food waste. Food waste continues to rise in rich countries due in large part to two factors: declining food costs and a rise in earnings. Essentially, when food prices drop and incomes jump, consumers are more inclined to throw out perfectly edible food. We get pickier too – for example, half of all produce grown in the U.S. is thrown out because it's bruised, misshapen, discolored or has some other non-threatening deformity.[4]

U.S. Food Expenditures
Proportion of consumer spending



Source: "How America Spends Money: 100 Years in the Life of the Family Budget," The Atlantic, 2012

Global Food Expenditures
Proportion of consumer spending



Source: "Individual consumption expenditure of households, NPISHs, and general government at current prices," UNData 2011-2015

Since the early 1980s in the U.S...

the cost of sugary non-alcoholic beverages – most sweetened with corn syrup – has dropped by **27%**.[3]

... while the real cost of fruits and vegetables has increased by **24%**.[3]

1 "How America Spends Money: 100 Years in the Life of the Family Budget", The Atlantic, 2012
2 "Individual consumption expenditure of households, NPISHs, and general government at current prices", UNData, 2011-2015
3 "The New Face of Hunger", The National Geographic, 2014
4 "The Maddening Reason Food Waste Is On The Rise Among The Rich", Huffington Post, 2017

AND ATTITUDES TOWARDS FOOD MAY BE DIVERGING

Foodporn and foodies*

For some, food has become a central part of their identities as well as their day-to-day lives.

47%

of young people surveyed say they self-identify as a "foodie".[2]

63%

of 13-32-year-olds in Ypulse's survey say they have posted a photo of food or drinks on social media to show off what that they or someone they were with was having.[2]

159 million +

public pictures on Instagram tagged as food porn.

23 billion

views of food videos in 2015, a 170% rise from the prior year.[1]

* The term "foodie" was originally coined to mean "food adventure seekers, culinary addicts who are interested in all food experiences, refined and not." – Source: Washington Post "Stop calling yourself a 'foodie'", Washington Post 2016

1 "Food becomes key ingredient for digital media groups", FT, 2016
2 "The growing influence of social food", Ypulse, 2015

Functional food

For others, food is purely functional – mind and body fuel. They are looking for quick, easy and nutrient-packed meal replacements.

120%

growth in smoothie production from 2010 to 2015 in the world's biggest smoothie market, North America.[3]

$14.7 billion

Projected global market for smoothies by 2021, or growth of more than 7% CAGR. Asia Pacific is expected to be the fastest growing market with a CAGR over 9% due to an increasing number of people with disposable incomes and changing food habits.[4]

New entrants

Companies like Soylent, Ambronite and Ample are replacing entire meals with milkshakes that provide all the nutrients the body needs to thrive – without the hassle of producing, preparing and… well, eating.

3 "North America Smoothies Market", Mordor Intelligence 2017
4 "Global Smoothies Market", Market Data Forecast 2018

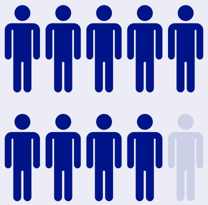
INCREASINGLY HEALTH IS THE ULTIMATE WEALTH, AND FOOD IS THE KEY

Even though what constitutes "better food" might be complicated, what's fueling the demand for it is quite simple: love – for our families and for ourselves.

Babies and Children's diets are an important factor in this shift

Parents want to give their children the best. That includes the food they need to be their best selves – food that is fresh, safe, nutritious and minimally processed. Global data collected by Canadean in 2015 showed that the majority of parents of children under five said they would be encouraged to buy a food or beverage product targeted for children if its formulation is "natural" or less processed. The older the parents, the more likely they are to search for these types of products. Furthermore, this trend appeared to lightly outweigh parents' preference for baby/kid food products that are more convenient and efficient for them.[1] "Organic" and "no added sugar" are amongst the most popular claims in launches of new baby foods.

[1] GlobalData's Consumer Survey, Q3, 2016; conducted with approximately 27,000 respondents across 25 countries



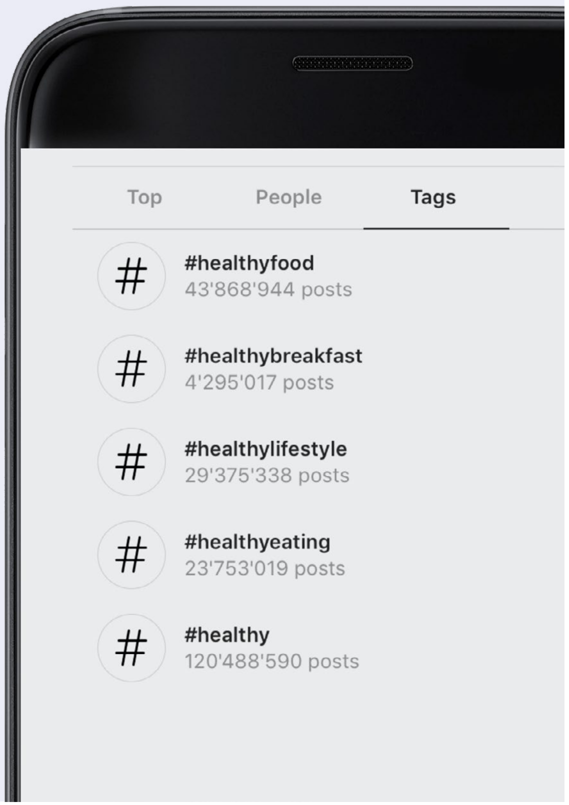
90%

of people said they consider eating well to be important or very important to how they feel about their health overall.[1]

10x increase in

searches that include the words "best food for" since 2005, often followed by, e.g. "health", "skin", "energy", "the brain" and "gym workout".

220 million tags



POSSIBLY EXPLAINING A DRAMATIC RISE IN VEGETARIANISM AND VEGANISM?

The increase in people following vegetarian and vegan diets is striking. If we take the UK as an example, 28% of meat eating Brits had reduced or limited their meat consumption, in the six months up to March 2017 alone. People reported their health as the primary motivation for limiting or reducing meat consumption, with weight management, animal welfare and the environment as secondary motivators.[1]

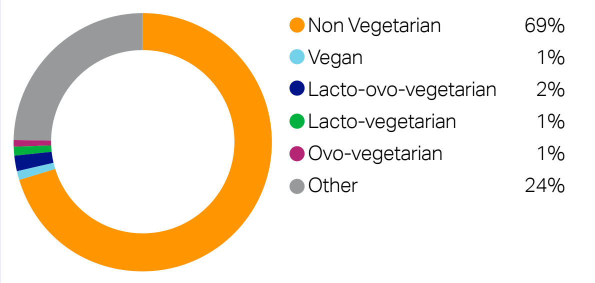
Interestingly, there's a chance that vegetarianism might be somewhat declining even while meat-free dietary habits are significantly increasing. In the decade up to 2016 the vegan population grew from 150,000 to 542,000.[2] There's also been a steady rise in people following a more "flexitarian" diet (predominantly vegetarian, occasionally vegan, without the restriction of 'never' eating meat or fish).[3]

All research points to both social media and "influencers" playing a significant role in raising awareness for these diets, especially in conjunction with initiatives such as "Veganuary", "Meat-Free Monday", and Twitter's #Veganhour.[3] These trends are also seen in a diverse range of advanced economies, such as Germany and Ireland. One report suggested the veganism had increased by 600% in 3 years in the U.S.[4]

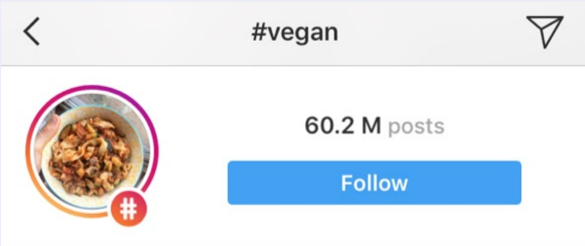
Companies are taking note. Products labeled as "vegan" have increased by 257%.[5] At its investor summit in 2017, Néstle announced that Naturals, Organics, "Free From", Reduced-sugar, High Protein, and Plant-based would be its leading future growth categories. Also in 2017, Danone acquired WhiteWave for $12.5 billion.

Diets in the UK

A survey conducted by Lightspeed suggests that just 1% of people identify as "vegan", but 24% selected 'other' despite options including "non-vegetarian" and "lacto-ovo-vegetarian" (which was a more popular choice than veganism, at 2%).



Google searches for "veganism" in the UK have risen dramatically over the last five years, with a recent peak in October 2017. Figures from Kantar show clear progress in the dairy-free market, with a year-on-year market growth of 18.3%. As a share of the total dairy market, the dairy-free segment has grown from 1.7% to 3.4% in the last five years,



[1] "Brits Carve Their Meat Intake", Mintel, 2017
[2] "The Unstoppable Rise of Veganism", The Guardian, 2018
[3] "Veganism, flexitarianism, and the power of influencers", Kantar, 2017
[4] "Top Trends in Prepared Food 2017", GlobalData, 2017
[5] "FReSH: Consumption and Behaviour Trends", WBCSD, 2018

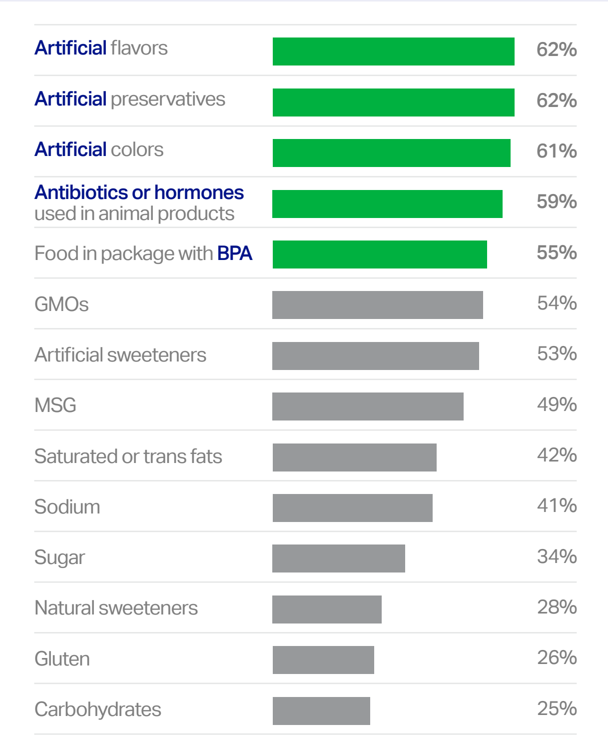
PEOPLE ARE INCREASINGLY SENSITIVE ABOUT WHAT'S IN THEIR FOOD

According to 2016 research from Nielsen, 2 in 3 global respondents* said they follow a diet that limits or prohibits consumption of some foods or ingredients.[1]

In another Nielsen survey, 70% of respondents said they actively make dietary choices to help prevent health conditions such as obesity, diabetes, high cholesterol and hypertension, and fewer than 45% of those who indicated they have a dietary restriction or food sensitivity or limitation, said their needs were being fully met by current products.[2]

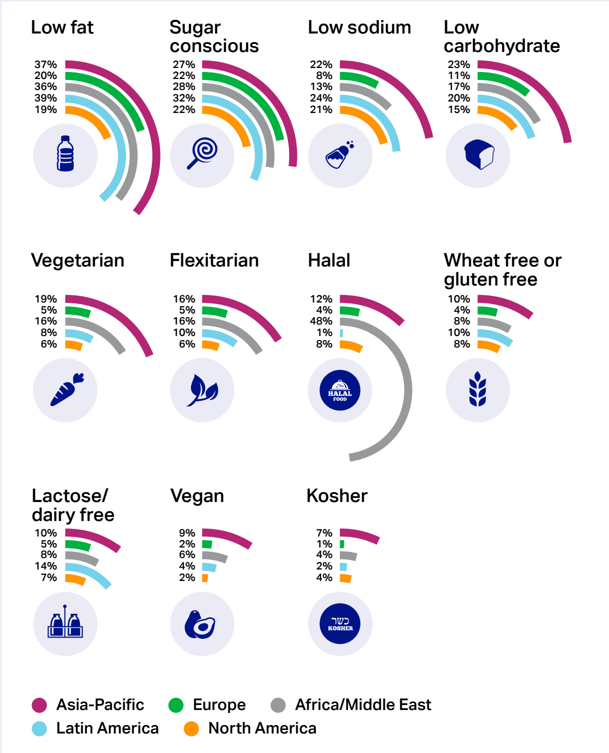
As a result, large numbers of people are taking an interest in the contents of their food, looking to avoid an ever-growing list of ingredients and substances.

% Nielsen respondents who say they try to avoid a specific ingredient or attribute (global average)



Data from: "What's in our food and on our minds", Nielsen, 2016

% Nielsen respondents who say they follow a special diet that limits and/or restricts specific foods or ingredients



Data from: "What's in our food and on our minds", Nielsen, 2016

* Nielsen Global Health and Ingredient-Sentiment Survey polled 30,000+ online respondents in 63 countries

1 "What's in our food and on our minds", Insight, Nielsen, 2016
2 "What's in our food and on our mind Report", Nielsen, 2016.

TRUST IN MODERN AGRICULTURE IS LOW, DRIVING INTEREST IN FOOD ORIGINS AND TRANSPARENCY

91% of consumers* want to know where their food comes from, yet

- 62% say they're not provided with enough (or the right) information on what's in their food and where it comes from, and
- only 12% of consumers trust food safety and 10% of consumers trust food quality.[1]

Trust is particularly low in some countries; for example, according to a Pew Research Center survey, 71% of people surveyed in China said that food safety was either a "very big problem" or a "moderately big problem."[2]

Customers have new levels of interest in both food origins and transparency.

- "Anti-artificiality" is fueling demand for real, natural, & organic products, with people thinking products are more authentic when they have "real" ingredients, and that a "natural" description makes a product more healthy. Products with "the lowest number of ingredients" are likely to be more appealing.
- This has led to a 23% growth in volume sales of snacks labeled as organic (5.7% with natural claim)[3] and 16% expected annual growth of the global organic market from 2015-2020.[4]
- Linked to greater interest in food origins, is a greater appreciation of "imperfect" vegetables. A wave of people are sharing their love for imperfect, "ugly" or "wonky" produce on social media. Some retailers, including Walmart, Whole Foods, Asda and Intermarché, pressured by their customers and food waste advocacy groups, are also getting on board.

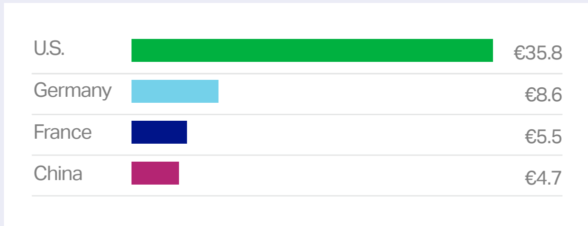
Labels have some way to go

In addition, customers are looking for meaningful transparency. There are over 455 health, safety and eco-labels for food products in the U.S. alone… but we struggle to make sense of even the few that we know.[5]

Take eggs as an example: there may be 10+ claims – cage-free, free-range, free-roaming, hormone-free, farm fresh, natural, USDA organic, pasture-raised, omega-3 enriched, antibiotic-free, vegetarian-fed – on any given carton.[5]

Often, customer expectations exceed the label – 60% of U.S. customers believe a "natural" label means packaged and processed foods have no genetically modified organisms, no artificial ingredients or colors, no chemicals and no pesticides. 45% believe "natural" is a verified claim; however, the FDA does not formally define the term.[6]

Organic retail sales 2015 (€ billions)



Data from "The World of Organic Agriculture: Statistics and Emerging Trends 2017", FiBL, 2017

* Trace One's "Global Consumer Food Safety and Quality" survey of over 3,000 shoppers across nine countries

1 "Global Consumer Food and Quality", Trace, 2015
2 "2015 China Consumer Survey", Pew Research Center, 2015
3 "The World of Organic Agriculture 2016: Key Data", Organic World, 2016
4 "Global Organic Food Market to Grow", Tech Sci Research, 2015
5 "'Wild west' of eco-labels", The Guardian, 2014
6 "More shoppers buying 'natural' food, yet most don't know what it means", USA Today, 2016

IT'S NOT JUST ORGANIC THOUGH – A RANGE OF FOOD PRODUCTION ALTERNATIVES ARE GAINING SOCIAL STATUS

Questioning the origin and health of our food is part of popular culture now. It's so much easier to get a behind-the-scenes look at how food is produced. Documentaries such as Cowspiracy, and Netflix series such as "Rotten", are revealing a darker side of food production to customers around the world. And it's not just animal welfare – human rights abuses are a major issue within the food supply chain, with 60% of all child labor occurring in agriculture, including farming, fishing, aquaculture, forestry, and livestock.[1]

This is contributing to a growing demand for "freedom food", which encompasses both "happy animals" and people along the value chain getting paid a living wage, with good work environments.

Fairtrade products have seen consistent sales growth.[2,3] As a result of growing consumer demand, U.S. grocery stores and restaurant chains that make up 70% of egg demand have promised to switch to cage free within the next 10 years.[4]

Going Locavore

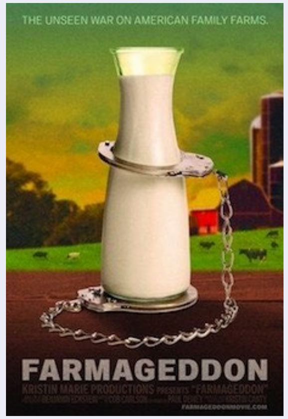
For some, the "local" label is a stronger buying criterion than "organic."

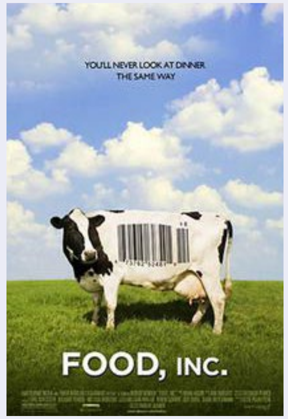
According to a survey by Newsweek, 80% of middle-class Europeans are prepared to spend more on food that is "local" and "sustainable."[5]

Shoppers in the UK said the food at farmers' markets was more appealing because it wasn't mass produced, so they trusted it more and considered it higher quality produce.[6]

Locally sourced meat, seafood and produce top 2016 food trends in the U.S.[7] and Walmart, the largest grocer in the U.S. pledged to double locally grown produce sales by 2025.[8]

The global preference for local foods has also caught up with Indian consumers who are increasingly buying and eating more produce from local sellers.[6]





1 "Child labour in agriculture", UN ILO
2 "Ethical food and drink worth over €10.5 billion in the UK", Food Navigator, 2017
3 "Fairtrade International Annual Report 2015-2016", Food Navigator, 2016
4 "Egg makers are freaked out by the cage-free future", CNBC, 2017
5 "Why Europeans Should be Paying More for their Food", Newsweek, 2015
6 "Why Do Consumers Prefer Local Products", Euromonitor, 2014
7 "Demand for local food on the rise", NRA, 2016
8 Global Responsibility Report, Walmart, 2016

IT'S NOT JUST ORGANIC THOUGH – A RANGE OF FOOD PRODUCTION ALTERNATIVES ARE GAINING SOCIAL STATUS continued

Slow Food

"Slow Food" was initially coined by Carlo Petrini and a group of activists in Italy during the 1980s. In the decades since, the concept of Slow Food has grown into a global movement – involving millions of people in over 150 countries – that embraces the strong connections between plate, planet, people, politics and culture.[1]

In Brazil, the Ministry of Health released new dietary guidelines in 2014 that align with Slow Food goals. They transcend a traditional nutrition-science frame to consider the social, cultural and ecological dimensions of our food.[2]

In the U.S. even the digital economy is trying to help power a revolution in Slow Food. On-demand food delivery has enabled (ironically) fast access to Slow Food – opening customers' up to creative meals with a conscience.[3]

What the local food movement is really about

- Knowing where your food comes from.
- Connecting to it in a meaningful way through stories and relationships.
- Trusting it is healthy and good for you.
- Supporting and celebrating and regional and/or local identity, culture and meaning.

"Slow Food represents positive globalization and gives a voice to those who refuse to surrender to an industrial approach to agriculture and the standardization of food cultures."

Nino Pascale,
President of Slow Food Italy[3]

[1] "What is Slow Food?", Slow Food, 2017
[2] "Welcome to Brazil, Where a Food Revolution Is Changing the Way People Eat", The Nation, 2016
[3] "Slow food, fast service", Campaign, 2016

NEED PROOF? LOOK AT NATURAL, ORGANIC, SMALL BATCH ALCOHOL

The craft beer movement is one of the clearest examples of this trend disrupting incumbent, global businesses.

There are more than 5,300 breweries in operation in the USA, more than at any time in the country's history, and 99% of them are craft breweries.[1]

The industry trade group, Brewers Association, said craft beer volume growth slowed to just 6% in 2016, compared to 13% the year before and an 18% increase in 2014. However, this slow down in growth is in part due to the acquisitions of smaller, craft breweries by mega-brewers, which saw their own sales flat-line then decline as a result of craft beer popularity.[1]

In the wine market, environmental and health concerns are driving growth in sales of organic wine – free from pesticides, colorants, thickeners, and flavor enhancers.

Europe is by far the largest producer of organic wine worldwide. Its organic grape area (land) constitutes almost 90% of the total area under organic grape cultivation worldwide. Since 2008, the organic grape area has increased by 17% annually; 6.6% of all grape areas in Europe are certified organic (2015).[2]

Although experts estimate that natural wine sales amount to less than 1% of the total worldwide – which reached nearly $268 billion in 2014 – 65% of 21-34-year-old respondents of a Nielsen survey indicated they are interested in natural wine.[3]

Across North America and Europe, there's a craft beer movement that has **cultivated a celebration of small brewer independence and local identity.**

The demand for real, natural and organic has signaled a **second wave of natural wine around the world**...

[1] "New Craft Beer Stats Show the Industry Is Aging", The Motley Fool, 2017
[2] "CBI Product Factsheet: Sustainable wine in Europe", CBI, 2016
[3] "Wine Wars: Is 'Natural' Really Better?", Bloomberg Business Week, 2015

HOW AND WHERE PEOPLE EAT IS CHANGING

Eating out is no longer saved for special occasions. It's "a way of life" for nearly half of global respondents to Nielsen's survey (48%) who say they eat at restaurants or other out-of-home dining establishments weekly or more often.[1]

27% of respondents who eat away form home say they eat street food, with the highest rates in Asia, e.g. Malaysia (51%), Taiwan (50%).[1]

Globally, quick-service and casual-dining restaurants are the most popular types of out-of-home dining in every region – but particularly in North America and Asia-Pacific. Fast casual restaurants* are rapidly growing in popularity, with an 11% increase in sales from 2015 to 2016 – almost double the rate of any other dining segment.[2]

*** "Fast-casual" restaurants, such as Chipotle and Panera (U.S), Leon (UK), and Nando's (global), offer quickly-prepared, affordable, and healthy food options, with fewer frozen and highly processed ingredients than traditional fast-food spots, such as McDonald's.**

1 "What's in our food and on our mind", Nielsen, 2016
2 "How the Fast-Casual Boom Is Changing the Restaurant Real Estate Game", CNBC, 2016
3 "Here's What the Average American Spends On Restaurants", Motley Food, 2017
4 "69% of Americans have Less than $1,000 in Savings", GoBankingRates, 2016
5 "The Changing Market for Food Delivery", McKinsey&Company, 2016
6 "Americans Will Soon Order Most Of Their Food Online, Further Shunning Human Interaction", Huffington Post, 2015

Americans spent more money at bars and restaurants in 2015 ($54.9 billion) than they did on groceries ($52.5 billion). This is worrisome given 69% of Americans have less than $1,000 in their savings accounts and 34% have no savings.[3, 4]

Rising incomes and competition within the restaurant industry go some way to explaining the growth in people eating out in many developed markets, but convenience is clearly a driver too. People are also taking advantage of new services offering the luxury of eating out, at home.

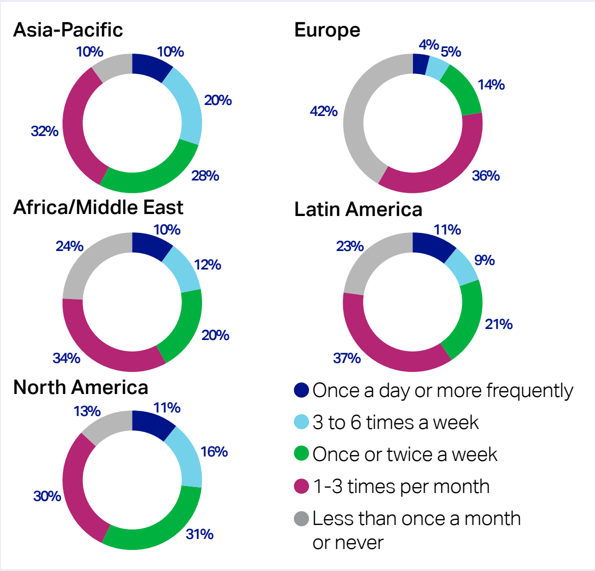
The market for food delivery represents 1% of the total food market and 4% of food sold through restaurants. The traditional model of placing an order with a local restaurant and waiting for home delivery, has 90% market share. Most orders are still placed by phone, but online platforms are expanding choice and convenience.[5]

The number of online food orders in the U.S. has doubled since 2010 to 904 million in 2015, and is set to overtake phone orders.[6]

The top 5 global startups in the restaurant delivery space (McKinsey estimate) are valued at over €10 billion

GRUBHUB deliveroo Takeaway.com Delivery Hero foodpanda

Frequency of dining out[1]



CONVENIENCE IS ALSO CHANGING HOW WE SHOP FOR FOOD

The reach of technology cannot be underestimated

Today, one-quarter of people globally* are already ordering groceries online, and more than half (55%) are willing to do so in the future. 40% of Chinese consumers already buy food online vs. 10% in the U.S.[1]

Online product sales are split roughly 60% non-food to 40% food. "Stock-up" categories (long shelf life) are most popular among global customers, with top purchase categories including body wash (33%), shampoo (31%), toothpaste (31%), and cosmetics (27%).[1]

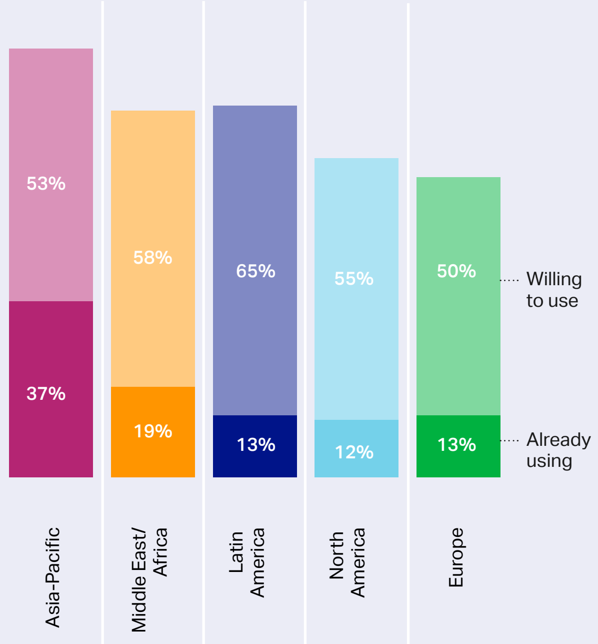
Although buying groceries online is a big time saver, prices can be 25% higher online – and finding the lowest price requires shopping around.[2]

China has the largest online grocery market – it is expected to be worth about $180 billion by 2020. Online grocery startups are marketing themselves as solutions to customers lifestyles challenges, such as Chinese customers' reliance on public transportation.[3] In the U.S., online grocery shopping is expected to grow five-fold over the next decade – to $100 billion by 2025 – led by Amazon, Google, Walmart, and Safeway.

Combining the convenience of home delivery with the pleasure of home cooking (and a chance of the taste of restaurant food), the "Mealkit" market has been growing rapidly in recent years. There are now more than 150 meal kit brands, including Blue Apron, Hello Fresh, Plated, Home Chef, Purple Carrot (vegan) and Peach Dish. The largest players – Blue Apron and Hello Fresh – deliver 5 and 4 million meals per month, respectively.[4]

Pre-portioned meals have proven to save people time, money and reduce food waste by up to 62% as compared to food waste from meals made with ingredients from traditional grocery stores.[5] However, most companies send meals in cardboard boxes with ingredients individually-wrapped in plastic bags and cooled with non-recyclable gel packs. The EPA estimates less than 15% of this sort of plastic packaging is recycled.[6]

Order online for delivery to home



Graphic and data: "The Future of the Grocery", Nielsen, 2015

*** Nielsen survey of 30,000 online respondents in 60 countries.**

1 "The Future of the Grocery", Nielsen, 2015
2 "Here's How Much Extra Money You Spend Buying Groceries Online", Time, 2016
3 "Grocery Delivery Startups Lead Financing In Food Sector", Forbes, 2016
4 "We tried Blue Apron, Hello Fresh and Their 4 Competitors", OBSERVER, 2016
5 "Cooking with a Meal Kit May Waste 62% Less than Grocery Store Ingredients", Fast Company, 2016
6 "This box opens up new possibilities for fresh food delivery", Fortune, 2015

THE QUEST FOR CONVENIENCE, EASE AND QUALITY IS DISRUPTING ONLINE AND TRADITIONAL FOOD SHOPPING

HelloFresh

"Discover a healthy meal plan"

HelloFresh was one of the earliest entrants into the meal kit market. Today it offers subscriptions in the United Kingdom, Germany, the Netherlands, Belgium, Luxembourg, Australia, Austria, Switzerland, the USA and Canada. HelloFresh IPO:ed on the Frankfurt Stock Exchange in November 2017, and was valued at €1.7 billion, giving it a market capitalization more than double that of Blue Apron, its largest U.S.-based competitor.

Blue Apron

Fresh ingredients, original recipes, delivered to You

Blue Apron is a U.S. service that delivers "farm-fresh ingredients and original recipes". The service creates menus using seasonal ingredients, which arrive in the correct proportions. The company aims to support local producers at the same time as offering customers better value than a local grocery store.

Plated

Cook more, live better

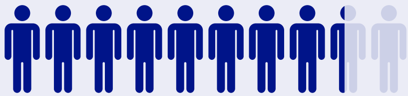
Plated is a very similar idea to Blue Apron. This video gives you a flavor of how these "tech start-ups" see themselves disrupting the way that people look at food. They think they are changing the world – and they may well be. But there is no question that they are very interested in changing behaviours around food – there will be a lot we can learn from their journey.

COOKING REMAINS A SOURCE OF JOY AND PRIDE

In spite of the steady increase in the frequency that people choose to eat out, they are also turning to cooking at home to express themselves, feel a sense of ownership and control over their health and (sometimes) save money.

"...If you post a picture of some awesome kale and goat cheese lasagna that you made, you're saying something about yourself: You're saying you have the ability to cook, you're saying you have the education, you're saying you have the time, that you have chosen to apply your discretionary income on getting organic kale and non-GMO goat cheese."

Eve Turow, on millennials' attitudes towards what they eat[1]



84%

of American foodies cook to **express their creativity**[2]

4.9 nights

per week that **millennials cook at home**[1]

Above all, food remains a way to spend time together, to meet or get people together, experience something new and celebrate food. Innovation is occurring on this front too, with in-home supper clubs and "pop-up" dining experiences surfacing across the world, but people are also exploring older traditions: communal tables have even returned to restaurants. Nonetheless, we should note that there is also evidence of the decline of the family meal and a rise of people eating alone (even a rise in the number of people eating in their cars).

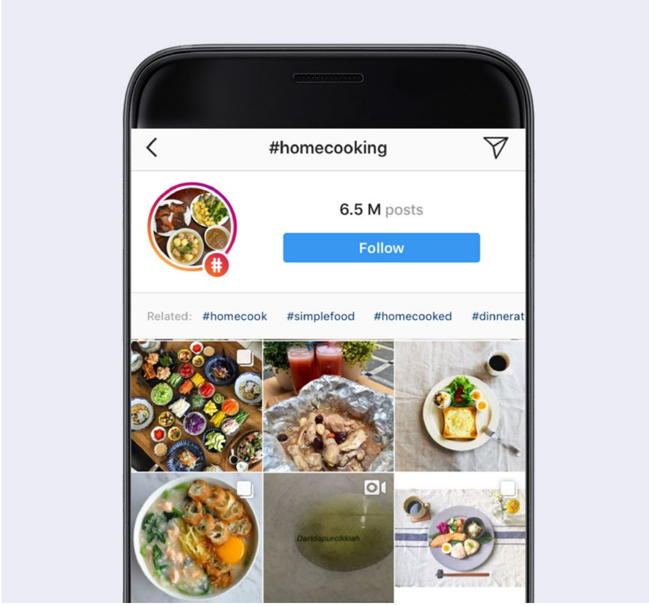
VS.

+2.7%

year-over-year **rise in restaurant prices**[3]

-0.5%

year-over-year **drop in average prices for food** eaten at home[3]



[1] "How 'Foodie' Culture Survived the Recession", Eater, May 2016
[2] "Meet the Modern Foodie: A Guide for Marketers and Retailers", PR Newswire
[3] "Why You Should Feel Even More Guilty About Eating Out at Restaurants All the Time", Time, 2016

FOOD REFORM FOR SUSTAINABILITY AND HEALTH (FReSH)

Further insights and information can be found in our **Food Reform for Sustainability and Health (FReSH)** Project Insight Report "Consumption Behavior and Trends: Understanding the Shift Required Towards Sustainable, Healthy and Enjoyable Diets" (FReSH Insight Report).

The FReSH Insight Report explores food consumption trends and behaviors that need to be accelerated, and conversely those that need to be decelerated and eventually reversed.

The report also includes a comprehensive list of the factors influencing people's food choices, including availability, affordability, cultural preferences, lifestyles and convenience. Furthermore, it details the most important food influencers (especially of young people), such as parents, schools, media, social context and social media.

The report identifies concrete steps for improving the food system in order to support healthy and aspirational diets within planetary boundaries, offering suggestions for how business can act and in areas such as innovation, proactive self-regulation and shaping consumer demand.

For more information, contact the FReSH team at WBCSD.

"As businesses we have provided a broad set of food choices to people for decades. In this era of increasingly constrained resources, population growth and dietary related disease, we need to deliver a broad set of food choices that all taste good, are nutritious, healthy and sustainable. To drive these better choices we must harness our knowledge of trends, behaviors and attitudes to food and align our business models within this paradigm shift."

Peter Bakker
President and CEO, WBCSD

TAKEAWAYS

Challenges

When we think about changing attitudes to food we may think of the rise in vegans or of millennials and their supposed love of avocado sandwiches. But what we see are changes in all the different ways in which we interact with food, across a range of geographies.

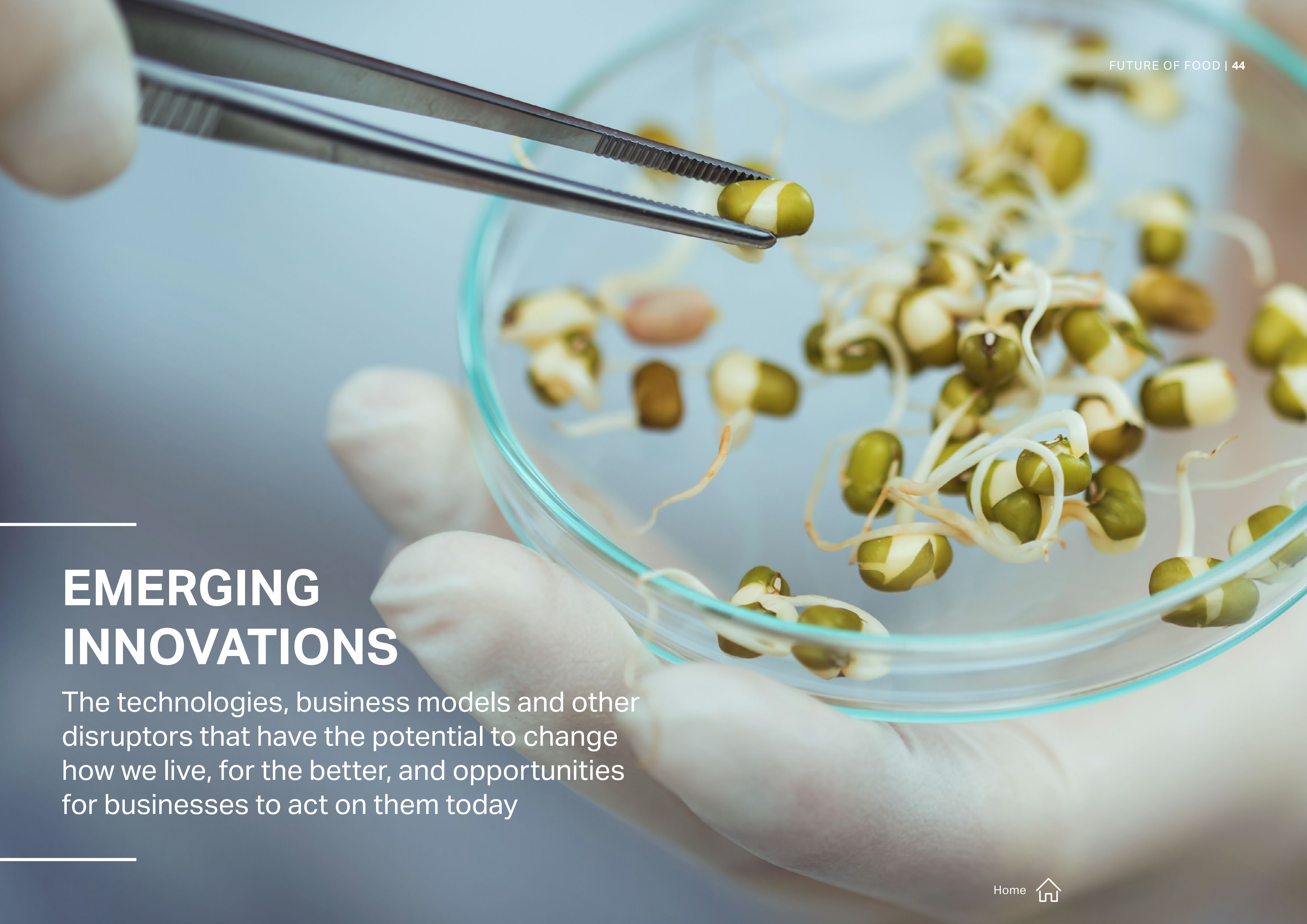
Income is clearly necessary for people to have a range of different food choices available to them, but the falling costs of certain food types (in some cases as a result of subsidies) have also affected the choices that people have been making. The role of policy cannot be underestimated. In fact, given the increased interest in how diet is linked to health, in the quality and safety of food ingredients, and in the increasing attention on waste, there is every chance that the role of policy will increase in the coming years.

Nonetheless, people are currently driving change all by themselves! From different ways of cooking, to increases in flexetarianism and veganism, to shifts in the ways that people do their shopping, a lot of the transformation is occurring free of influence from business.

Not all of the shifts are necessarily good. Mass urbanization is leading to increasingly diverse food choices, but also creating markets for increased convenience. This isn't always a good thing (for instance, family meals have declined in many markets). Business will influence future lifestyles depending on the trends it chooses to invest in and promote.

Opportunities to consider

- Interest in local, slow and organic food as well as other "higher quality" and "artisanal" products offers an opportunity to sell higher margin, potentially more sustainable foods.
- However, we must consider how this can be offered at scale. Further understanding is required between people's interest in "natural" foods versus greater demand for transparency, understanding, and trust in the food that we eat.
- Similarly, while convenience is already proving to be a major driver of urban food consumption, can we offer quick and ready-to-go options that still embrace the nutritional, cultural and social significance of meals? Within a future quick, ready-made, easy-to-cook market, companies can explore how to offer sustainably produced, nutritionally planned and serving-size balanced food that has the potential to meet the needs of, and reduce the waste created by, increasingly health-conscious societies.
- According to the recent FReSH Insight Report, with food prices expecting to double over the next 20 years, one of the greatest opportunities will be in meeting demand for affordable nutritious foods from low-income and new middle-class families.



EMERGING INNOVATIONS

The technologies, business models and other disruptors that have the potential to change how we live, for the better, and opportunities for businesses to act on them today

DISRUPTION OPPORTUNITIES THAT ARE ALREADY SHAPING THE FUTURE

Every day, our understanding of the relationship between food and our health improves. The food industry is already investing significant amounts into how we might personalize our diets and nutrition in the future.

This personalization will be part of a revolution around our relationship with food – how we grow it, what we make it from, how we buy it, how much time we spend on it and how we value it. We can expect farming technologies and locations, new alternative and animal-free proteins and new ways of getting nutrients into our food. Technology will also enter our relationship with food more and more, both in terms of tracing and transparency, but also in the planning, buying, and preparing of our meals.

Food continues to be one of the key components of culture – tricky conversations about health and waste can be successfully anchored in discussions about food. The clear links between food and land, human health and environmental health, are ready to return to cultural prominence.

REVOLUTIONIZE HEALTH THROUGH PERSONALIZED DIETS & NUTRITION

"The same dietary advice cannot be good for everyone, because we are all different."

Eran Elinav,
Immunologist

Research increasingly suggests that each of us is unique in the way we absorb and metabolize nutrients. Soon, nutritional advice may be based on distinguishing factors such as genetic makeup, gut bacteria and body type.[1]

Food company scientists are researching how to use nutrigenetic testing or data gleaned from customers' gut bacteria, medications, family histories, and lifestyles to prescribe personalized diets.[1]

Several companies, including Vitagene, Nutrigenomix and DNAFit, are already offering individualized dietary counseling; however, many scientists believe more research is still needed, as the interactions among one's genes, microbiome, diet, environment and lifestyle are extremely complex.[1]

As such, the Academy of Nutrition and Dietetics does not recommend nutrigenetic testing as a means of providing dietary advice on the grounds that it does not have enough evidence-based studies to prove effectiveness.[2]

Nestlé is exploring "food as medicine"

Food as a 'means to long life': Nestlé envisions a future where food operates more like medicine, arguing that the food we consume on a daily basis is the largest single influence on our health.[3]

Betting Big on the Future of Medicinal Food: Nestlé Health Science describes itself as "a health-science company aiming to foster a therapeutic role for nutrition in healthcare"; its motto is "where nutrition becomes therapy," often targeting specified diseases, like crohn's disease and epilepsy. Nestlé plans to apply its new scientific knowledge to food products – something that could one day include a frozen pizza that's healthy and prevents Alzheimer's disease.[3]

Individualized diet plans: Nestlé envisages a future in which people undergo health testing during varying stages of life to learn more about the genetic material of the microbes – the bacteria, fungi, protozoa, and viruses – living inside their bodies. Each time, the tests would analyze genetics, caloric levels, predisposed illnesses, and more. Such information would allow Nestlé to create products that alleviate known health issues.[1]

Tech-enabled experience: In July 2016, Nestlé and Samsung announced a partnership to develop a digital health project, pairing Nestlé data with Samsung hardware. In the future, we may have watches that house a nutritional database, or be able to install dietary data into sensors implanted beneath a person's skin that might send an alert if they sense, for instance, an iron deficiency, or a need to schedule a doctor's appointment. Eventually, sensors might connect directly to the doctor's office, alerting a physician if an abnormality is detected. It's a vision for a more digitally-connected health system which may eventually catch Alzheimer's, early onset diabetes, or even the early stages of cancer.[4,5]

1 "A Personalized Diet, Better Suited for You", New York Times, 2016
2 "Position of the Academy of Nutrition and Dietetics", Pub Med, 2014
3 Nestlé Health Science
4 "Nestlé Develops Foods to Treat Diseases", WSJ, 2016
5 "Chairman of the world's biggest food company makes the case for a new kind of diet", QUARTZ, 2016

BRING FARMING INTO THE CITY

High-tech farms in urban warehouses can grow 100 times more food using 95% less water than traditional farms and use no pesticides or chemicals and they're becoming big business.

For instance, in the USA, New Jersey's AeroFarms has raised more than $50 million and says it can grow over 900 tons of food each year in the "growing towers" in its 7,000 square meter facility in Newark.[1] Gotham Green invested $8 million to build a rooftop farm in Chicago's Pullman neighborhood.[2] Last year, New Jersey startup Bowery Farming, which attracted $7.5 million in a seed funding round, began selling locally grown leaf vegetables at Whole Foods and restaurants in Manhattan, including Tom Colicchio's Craft. Bowery estimates its facility is 100 times more productive per square foot than a typical farm.[2] Urban farms also offer unexpected new opportunities. Philips is now able to design the lighting solutions that allow urban farms to grow crops all year round (see GrowUp video).

For many of these urban agriculture projects, chefs are often the initial customers, citing the higher quality, freshness and taste of such local products. This isn't just limited to modern high-tech aquaponics projects, but also to more traditional methods such as the Chinampas farms located in Mexico City's Xochimilco. Yolcan, a Mexican social enterprise, is supporting farmers who are following ancient traditional methods to provide some of Mexico City's most celebrated chefs with fresh produce for their internationally renowned restaurants.[3]

AeroFarms, USA

GrowUp Urban Farms, UK

1 "How Does This Garden Grow", NY Times, 2016
2 "Inside The Computerized Lettuce Factory of the Future", BuzzFeed, 2017
3 "Mexico City has turned into a major dining destination", Business Insider, 2017

BRING THE COMMUNITY INTO FARMING

Urban farming isn't just a commercial endeavor however. Community gardens are being built in urban areas across the world – from Detroit to London to Tokyo to Sydney – on rooftops, on deteriorating plots of land and in abandoned buildings. There was a 200% increase in the number of U.S. households actively taking part in community gardens from 2008 to 2014. With 600+ community gardens, NYC has the largest concentration.[1]

"Along with growing food, we're growing culture, we're growing community... Developing consciousness is very important. We're not just growing food, we're becoming part of this process of existence in the whole ecological system that exists not just in the garden, but has existed since the beginning. We're developing a humanistic practice."

Myrtle Thompson and Wayne Curtis
of Feedom Freedom Farm, Detroit.

In the U.S. in (sub)urban areas, there are now over 200+ "agrihoods" – housing developments built around community farms. The Michigan Urban Farming Initiative outside of Detroit was named "first sustainable agrihood" in the U.S.[2]

But in Asia, Architecture firm SPARK has taken the idea of an agrihood even further. SPARK unveiled the design for the "next generation of retirement housing" – a community of homes and health facilities combined with a vertical urban farm.[3] Homefarm aims to tackle two issues affecting Southeast Asian cities: the growing number of people aged 65+ (e.g. 1/5 of Singapore's population by 2030) and food security (90% of food is imported in Malaysia).

Homefarm

Civil Eats

[1] "How Community Gardens Are Revitalizing Cities", Organic Life, 2016
[2] "Growing Agrihoods: The Next Frontier in Urban Revitalization", Civil Eats, 2017
[3] "Visionary Homefarm combines retirement homes and vertical urban farms", inhabitat, 2015

EMBRACE ALTERNATIVE PROTEINS FOR A MEAT FREE WORLD

Our diets are an area where a shift in behavior can have the most direct impacts on both our health and the environment, while still maintaining our quality of life. While going fully vegetarian would cut an average American's diet-related land use and GHG emissions by more than half, smaller tweaks can also have a significant impact.[1]

Research from the Oxford Martin School, found that simply adhering to health guidelines on meat consumption could cut global food-related emissions by nearly a third by 2050, while widespread adoption of a vegetarian diet would cut emissions by 63%.[2]

WRI ran a scenario whereby the 2 billion people globally whose diets are "big" and high in meat and dairy, had their protein consumption reduced down to the recommended 60 grams. The scenario freed up about 640 million hectares (1.6 billion acres) of land currently dedicated to growing animal feed (approximately twice the size of India).[3]

Some are predicting that one third of the protein market could be claimed by alternative proteins (insects, algae and bioengineering) by 2054.[4]

Hampton Creek makes egg-free mayonnaise, cookies and other household ingredients from a particular variety of Canadian yellow pea and has distribution deals with Walmart, Safeway, Target and Costco in the U.S. alone.

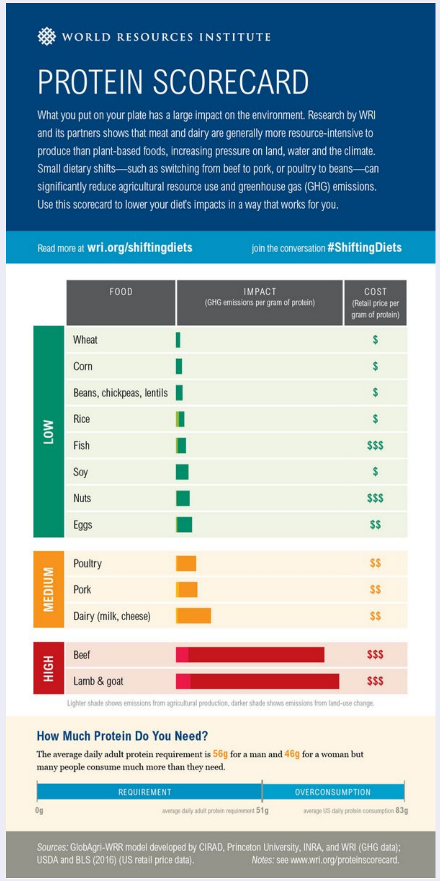
Impossible Foods, which has received $74 million from investors, deconstructed hamburgers to figure out what gives them their texture and flavor and found botanical equivalents to create a plant-based burger.

Beyond Meat is now selling its plant protein "beef" patty in Whole Foods[5] and Modern Meadow uses muscle-cell cultivation to grow "novel biomaterials".

Chapul is hoping that it can encourage more people (particularly westerners) to join the 2 billion who already eat insects, and start eating protein bars made from cricket powder.

New Wave Foods is developing "shrimp" from algae.

Forum for the Future has created a global coalition, including Ahold Delhaize, Evonik, Firmenich, Hershey, Quorn, Target, and Waitrose, General Mills and Nestlé Research, to work on "The Protein Challenge 2040", which explores how to feed 9 billion people enough protein in a way which is affordable, healthy and good for the environment.[6]



1 "How I Tweaked My Diet to Cut its Environmental Footprint in Half", WRI Blog, 2016
2 "Eat less meat to avoid dangerous global warming", The Guardian, 2016
3 "Shifting Diets for a Sustainable Food Future", WRI, 2016
4 "Alternative proteins to claim a third of the market by 2054", luxresearch, 2015
5 "The Market For Alternative Protein Products", Economist, 2017
6 "The Protein Challenge 2040", Forum for the Future, 2017

JOIN THE WAR ON WASTE – SAVING AND SHARING FOOD WILL BE INCREASINGLY MAINSTREAM

Waste is a disgrace – but it remains acceptable in many societies around the world. Slowly however, movements are building that are finding innovative ways to address this. These aren't fringe – waste has entered main stream popular culture with TV shows hitting screens in Australia, Germany, the UK and USA. In France, legislation was passed in 2016 banning supermarkets from throwing away or destroying unsold food.

There are a number of businesses exploring how they can best help customers avoid some of the food waste in their daily lives, particularly through packaging solutions.[1]

Extending produce's shelf-life

Using plant materials left behind after fruits and vegetables are processed, Apeel Sciences creates imperceptible, edible barriers that extend the life of produce like green beans and berries.

Edible packaging

Drawing inspiration from the grape, Harvard Professor David Edwards created WikiCell – an innovative and edible soft skin, or outer layer, that holds and protects food and drink such as yogurt, ice cream, juice and pudding.

Non-stick packaging

Liquiglide, which developed an FDA-approved "permanently wet slippery surface" that makes "viscous liquids slide easily," estimates that if the sauces market used its coating, 1 million tons of food waste would be avoided each year.

Packaging that dissolves

MonoSol sells water-soluble bags made from food-grade ingredients for pre-portioned oatmeal or rice. When cooked, the bag dissolves, leaving only the food, ready to eat.

Packaging that grows

Although it's a little gimmicky, Reduce Reuse Grow designs compostable coffee cups that are studded with native seeds so that the cups can grow into something new following use.

[1] "An (Edible) Solution to Extend Produce's Shelf Life", NY Times, 2016

AND SAVING FOOD MIGHT SOON BE CULTURALLY EXPECTED

Public service and NGO Campaigns

In the UK, the Waste and Resources Action Programme has for many years run "Love Food Hate Waste", raising awareness about how much food people waste, how it impacts their household budgets, and what they can do about it – from proper food storage, preparation of the appropriate amount of food and date labeling, to options for leftovers. According to WRI's recent analysis in 2017, every £1 invested resulted in savings of £250.[1] The U.S. Ad Council and the Natural Resources Defense Council launched a similar major national public service campaign in 2016.

Organic Community Actions

Peer-to-peer food sharing networks are emerging as a way to reduce waste and contribute to the community. For instance, again in the UK, Casserole Club is a site currently operating in two towns that allows home cooks to give away extra portions of a meal they are cooking to people in the community – over 7,000 people have signed up. In Germany, Foodsharing, allows individuals, retailers, farmers, and restaurants to post and give away unused food. And in the USA, Ampleharvest.org connects home gardeners with food pantries and has given away more than 20 million tons of produce.[2]

Pop Culture

TV shows and movies around the world are championing food waste reduction. Many make the use of "scraps" aspirations; in one U.S. TV series, chefs travels across the U.S. to celebrate local cuisine and create meals with food items many consider to be waste.

Love food hate waste

Casserole Club

[1] "The Business Case for reducing Food Loss and Waste", WRI, 2017
[2] "Food: The Next Frontier For The Sharing Economy?" Fast Company, 2013

RE-BUILD TRUST IN FOOD THROUGH IMPROVED CONSUMER INFORMATION TECHNOLOGY

New collaborations in 2017 – between IBM and Nestlé, Unilever and Walmart as well as Alibaba and PwC – are exploring the use of blockchain for a more transparent and trustworthy food supply chain.

Blockchain can enable open-source transparency technology, allowing for digital product information, including farm origination details, batch numbers, factory and processing data, expiration dates, storage temperatures and shipping details to be digitally connected to food items.[1]

The hope is that the data could potentially help reveal food safety issues, as well as help retailers better manage the shelf-life of their products.

But how do we get the information to customers in a way that they can engage with?

Carlo Ratti, founder of MIT's Senseable City Laboratory, partnered with Italian grocer Coop to create a "Supermarket of the Future," in December 2016.

When a customer wants to know more about any item of produce, like an apple or a head of lettuce, they simply hold the item up and an overhead display reveals all the important facts about it. Microsoft Kinect sensors built into the mirrored display identify the item and present detailed information on price, nutritional value, presence of allergens, pesticides or fertilizers used in production, journey to the supermarket and waste disposal instructions. Additional monitors display information aiming to promote more conscious and sustainable consumption.

"In the near future, we will be able to discover everything there is to know about the apple we are looking at: the tree it grew on, the CO_2 it produced, the chemical treatments it received, and its journey to the supermarket shelf."

1 "Leveraging blockchain to improve food supply chain traceability", IBM, 2016

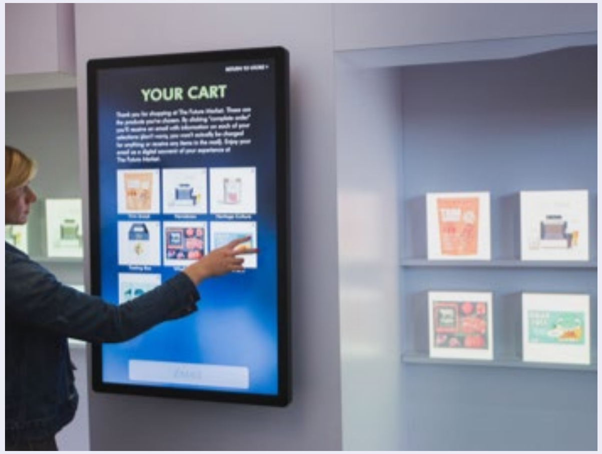
LEVERAGE TECHNOLOGY TO PERSONALIZE MEAL PLANNING AND FOOD SHOPPING EXPERIENCES

Technology will drive the future of food retail, but that doesn't mean it will all be app-based and online. Amazon "Go" (Amazon's physical local grocery store that doesn't have cashiers) opened last year in Seattle and gives us an idea of one of the directions food retail might go in.

The Future Market is a futurist food project that explores how we will produce and shop for food over the next 25 years, to help food companies innovate more ambitiously today.

Founder Mike Lee launched the pop-up concept grocery store at the Summer Fancy Food show in NYC, June 2017 to "show what it looks like when today's bleeding-edge trends, behaviors, and technologies become mainstream products and services in 2042."

"In the future, uniform mass production and marketing have fallen out of favor. Food is customized and as diverse as the people who eat it. The shopping experience is also tailored to an individual's FoodID, a system that records and analyzes food preferences with user inputs and real-time biometrics. Through advancements in cellular agriculture, vertical farming, and 3D food printing, food can be made on-demand and to the exact specifications of the eater. The food system of the future generally makes a lighter impression on the Earth and in many cases, agriculture regenerates our planet."



Photos and quote from the "Experience" of Future Market

PREPARE FOR SMART, MINDFUL, AUTOMATED KITCHENS

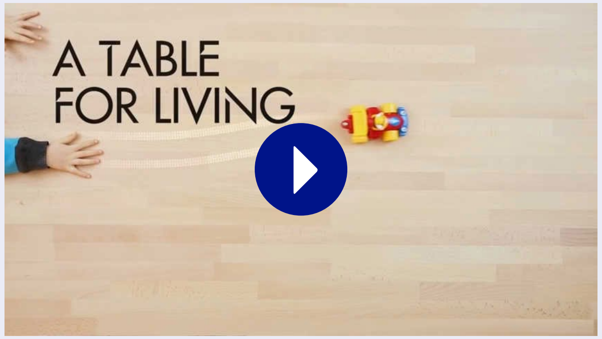
All of this culminates in a kitchen that can help you cook the ingredients and meals best suited for you personally, in the most efficient, effective and enjoyable way possible.

Whirlpool has been working to make our kitchens more intelligent.[1] Their R&D teams are exploring how the kitchen can anticipate residents' schedules, for instance by tracking to-dos, how it could suggest personalized cooking based on overall diet, favorite foods and nutrition goals, and also sensing and reacting to contents on a surface to heat or cool to the ideal temperature.

IDEO & IKEA collaborated on a 2025 CONCEPT KITCHEN. This kitchen facilitates mindfulness with cues throughout that guide people toward making informed decisions.[2]

- The modern pantry and table inspire people to use what they have on hand rather than go out and buy more.
- The modern table is multimodal for working, cooking, or eating, and fits in smaller, urban spaces.
- The modern sink and disposal nudge people to be more conscious of water consumption and waste disposal.

IKEA's Concept Kitchen



Moley is asking if we need to cook at all…

[1] "Whirlpool Smart Kitchen Concept Demos the Future of a Day of Care", Whirlpool, 2016
[2] "Designing the Future Kitchen", Ideo, 2015

TAKEAWAYS

Challenges

There has been an astonishing amount of innovation in the food system over the past 60 years. Between 1960 and 2015, agricultural production more than tripled. During that time entire industries have appeared, new market segments have exploded (along with waistlines) and the world has become a much smaller place, with global cuisines becoming part of everyday life in many places, not the exotic luxuries they used to be. All around the world, people have accepted and often embraced these changes.

In other words, multinationals have both the reach and the ability to drive innovative change in the global food system. The next food revolution will balance global diets, bringing back the "good" in food using the technologies of the 21st century, just as the Green Revolution fully used the innovations of the 20th century. The potential effects of climate change on the nutritional content of our food will demand even greater attention be placed on the creation of our food[1], at the same time as we target ever more individual diets, personalizing them as our bodies (and tummies!) require.

And while technology will clearly play an enormous role in the way the food system transforms, societal and social influences may prove to be just as significant. Social media is influencing food culture at a significant scale, and trust and transparency concerns have boosted people's interest in the provenance of their food. Start ups are looking at ways to bring farming into urban centers across the globe, both industrially, and also as part of efforts to grow bonds within racially and demographically diverse communities.

Opportunities to consider

- According to the Business and Sustainable Development Commission, meeting the challenges of the food and agriculture sectors sustainably could unlock 14 major business opportunities worth US$2.3 trillion annually by 2030. For instance, reducing food waste in value chains could be worth US$405 billion; low-income food markets are valued at up to US$265 billion in revenue growth.[2]
- According to the recent FReSH Insight report, the key opportunities for business range from sustainable and "high-tech" packaging, to health opportunities in retail that make affordable healthy foods accessible. Food system transformation will demand proactive measures from business, including self-regulation. One example given is in engaging people in "the right way", which could include reframing the value of food, or improving labeling to make it clearer and help avoid unnecessary food waste.
- The future of food lies in helping people to access appetizing, aspirational, healthy and sustainable food. It can't be hard, it can't be unappealing and it can't be something that only the middle class has access to. Importantly, business has to take responsibility for the role it can play in maintaining the balance between health and desire, between convenience and the cultural importance of cuisine and cooking.

1 "The great nutrient collapse", Politico, 2017
2 "Valuing the SDG Prize in Food & Agriculture", Business & Sustainable Development Commission, 2016

FUTURE ASPIRATIONS

Good Life 2.0 aspirations that support a better food future

THE GOOD LIFE 2.0

WBCSD has been exploring the emergence of a "Good Life 2.0", publishing the findings in **The Good Life 2.0 Playbook**. It presents the aspirations appearing in society that celebrate a world in which people aspire to lifestyles that are better rather than bigger, but without trade-offs or settling for less. It provides a window into people's lives as they search out smarter, cleaner and healthier ways of enjoying their lives.

The purpose of the Playbook, is to show companies that they can promote these emerging aspirations in their communications with their customers, helping to grow their gravity within culture and to build demand for smarter, healthier, cleaner products and services that happen to be more sustainable too.

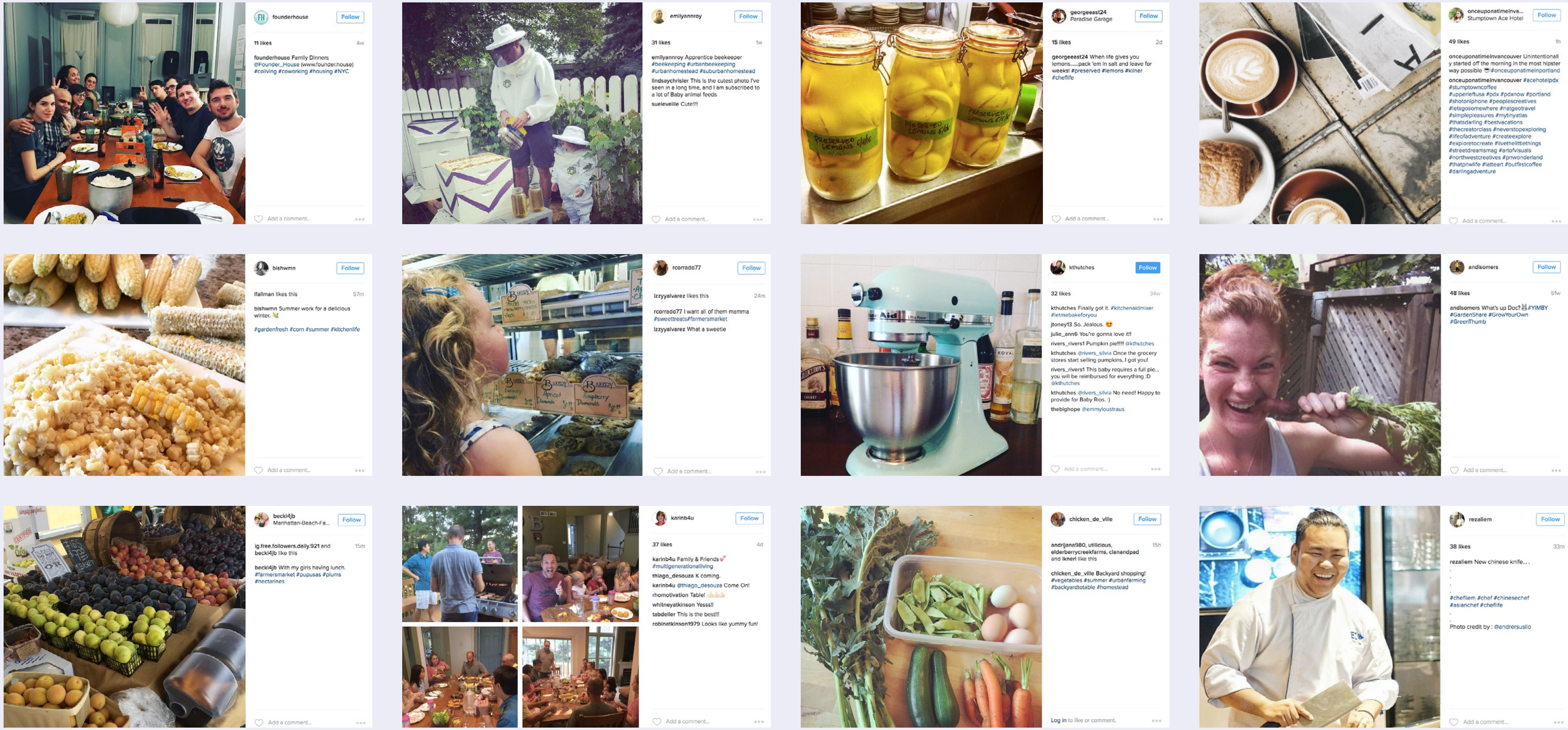
The Playbook looks at four different groups of emerging aspirations: our relationship with our "homes & families"; how we are taking "time to slow down"; the notion that "the journey matters"; and how we are keeping our "work & life in balance". Within these categories we look at 20 more specific aspirations that we observed emerging within culture. Several of these were linked to our relationship with food.

These included:

- **A Full House:** Togetherness has real social currency (people want to spend time with each other at their homes, often over a meal).
- **A Sense of Place:** We're growing more sensitive to native environments (we're interested in local and seasonal flora for our gardens).
- **Time to grow:** We're growing and sharing food (we're taking the time to understand where our food comes from and what goes into it).
- **Time to save:** Canning and sharing things we grow is pure indulgence (we're making sure that we get the most enjoyment out of things, including saving food from waste, or finding old ways to store and enjoy tasty ingredients out of season).
- **Time to savor local flavors:** Real food is beautiful (and delicious) enough to share (we promote what's local – locally grown, locally made and locally cooked, by us or by professionals – local is now luxurious in the way exotic once was).

Further links can be drawn between our appreciation of "pursuing passion" and "interesting lives", of our celebration of "makers and artisans", of the importance of "experiencing the world we live in", and of course, of "taking care of mind and body". Our lighthouse takes these aspirations as the guidelines for our future relationship with food and the specific ways in which we can work to improve what people are offered today.

PEOPLE LIVING THE GOOD LIFE 2.0



LIGHTHOUSE

The Future of Food – To what we might aspire

WHAT WE WANT FOOD TO MEAN

WISDOM FROM WORLD RENOWNED CHEFS[1]	What we want food to MEAN	
COMMUNITY OVER INDIVIDUAL	*"Community is coming before individual" says Massimo Bottura – "I see a culinary world where chefs become leaders in their communities, not only promoting healthy food but making more of that food accessible to more people."*	**Chef Massimo Bottura,** Modena, Italy.
SUSTAINABILITY	*"Many young chefs and home cooks are looking to chefs for inspiration, and if we have a menu with a bunch of unsustainable ingredients on it, we are contributing to the problem."*	**Chef Ben Shewry,** Melbourne, Australia.
MORE ADVENTURE	*"Diversity is essential for life, and food. With more people traveling and tasting different foods, chefs are including a variety of ingredients and produce in their mix. A vibrant food scene means farmers and producers are more creative and adventurous than ever as they try to grow and create new things wherever they are."*	**Chef Margarita Fores,** Manila, Philippines.
SIMPLICITY	*"The future is in the basics."*	**Chef Gaggan Anand,** Bangkok, Thailand.
STORIES ON A PLATE	*"Diners will seek out simple produce so that they can experience the culture, history and taste of a cuisine in one bite. Single origin produce with a story and tradition will come back with more value to express quality and emotion.*	**Chef Virgilio Martinez,** Lima, Peru.

1. "Hottest Food Trends From the Hottest Chefs", CNN, 2017

WHAT WE WANT TO FEEL

THE GOOD LIFE 2.0 FOOD ASPIRATIONS	What we want to **FEEL**

"I understand my body and what kind of diet will make me feel my best. And will be life-extending."

"I feel connected to the food I eat – I know where and from whom it comes."

"I have the information I need to make the right choices for me and my family."

"I can afford to buy the food that I trust is safe and healthy."

"I am proud of the food I put on the table for my family and know it nourishes them."

"When I have a meal I am transported to that place."

"When I have a meal, I am transported back to Sunday lunch with my grandmother."

"When I cook for others I am presenting my cultural heritage – I use our family secret recipes."

"When I have a meal I really understand the people from that place."

"When I host guests I am living up to my culture's traditions of hospitality."

"I get to experience food elevated to an art form."

"I get to indulge without feeling guilty, or feeling sick."

"Planning, shopping and preparing is a breeze; it stops consuming half of my Sundays."

"We're saving so much on groceries – yet I don't feel like we're giving up anything. And I don't dread cleaning the refrigerator every weekend and having to throw away half of what we buy. We've stopped wasting."

"When I cook, I get to express myself. I get to be an artist."

THE LIGHTHOUSE

LIGHTHOUSE VISION The Meaning of Food	**Food to Nourish** Mind, body & spirit for longevity, vitality and joy
WHAT THIS MEANS For a Person's Life	**What This Means, For a Person's Life** **Connect** to ourselves, others and nature through our food **Trust** how everything is grown, produced and delivered Have the information to **make easy decisions**, but also cook well & stay curious! **Celebrate** culture, family and friends
WHAT THIS MEANS Practically	**What This Means, Practically** We understand the nourishment we (personally) need to live long, healthy lives. Everyone has access to a balanced diet that is affordable, safe, healthy and tasty. Better transparency and tools make it easier to discover, plan and create meals, facilitating the purchase, preparation and disposal of food. Nothing is wasted. All the people involved in getting food to us are provided with a living wage and good working conditions. Our food is free of cruelty and is sustainably produced.
INNOVATION SPACES	**Growing**: **Soil** health, ecological diversity and conservation agriculture; Agriculture for **improved nutrition**; **Local** food ecosystems, incl. community and at home; **Vertical** farming **Producing + Packaging + Distributing**: Alternative **proteins**; Formulating +reformulating for **wellbeing** and **safety**; Smart **packaging**; Quicker **distribution** to customer, incl. omni-channel **Planning + Shopping + Experiencing Food**: **Personalized diet** planning; Radical product-level **transparency and trust**; Frictionless **shopping** experience that still supports discovery: in-store, online, and in between; Better **meal planning, preparation + disposal**
WHAT MUST BE TRUE	Zero waste; Regenerative; Resilient; Safe & secure; Within planetary boundaries; Inclusive & equitable; Shared; Fair labor
ENABLERS	Policies & incentives (financial & non-financial); Promoting new aspirational behaviors

SUMMARY

Food offers us a wonderful opportunity for shifting people towards more sustainable lifestyles. It is an area where people can control their impacts very directly through the foods that they eat, and where a healthier diet for us is also better for the environment. If we could make a healthy aspirational diet available to everyone, it would be a true win-win.

We also know that driving change of any nature is hard, even when it is absolutely in our self-interest (just think of the slow adoption of seat belts). While there is undoubtedly a growing interest in our health, food, and nutrition in society, there are also conflicting trends, for instance towards greater convenience and processed foods. Shifting diets will only be possible if we look at the entire system of food choices that people are exposed to. And sustainable diets must be available and affordable to all, not just the privileged few.

This lifestyle research and Future of Food Lighthouse is an effort to examine the entire food system using the individual as the starting point for our investigations. The Lighthouse provides you with our best imaginable future of food. It's an inspiring people-centric vision of a (sustainable) lifestyle that highlights people's needs and wants from their lifestyles (today, tomorrow, in 5 years, in 15 years), and identifies spaces in which innovation needs to occur to be able to deliver this vision.

Companies should use this research and Future of Food Lighthouse as a foundation for conversations with colleagues in R&D, Innovation, Insights, Marketing, Brand Strategy and public affairs. It is designed to quickly engage colleagues and partners in a shared positive vision of the future your company can play a role in creating. It reveals both where you can add value towards this vision today, as well as future innovation opportunity areas in support of this vision.

We hope that companies all around the world will be inspired by this vision, and use the ideas and trends that we have drawn from to accelerate the creation of, and customer engagement in, a more sustainable and aspirational future of food for all.

Julian Hill-Landolt,
Director, Sustainable Lifestyles
WBCSD, Geneva, June 2018

APPENDIX

A flavor of food trends in different countries

Note: the following slides are intended to give us a 'flavor' of nuances; they are not exhaustive

COUNTRY FOOD PROFILES

For each country,* we took a closer look at:

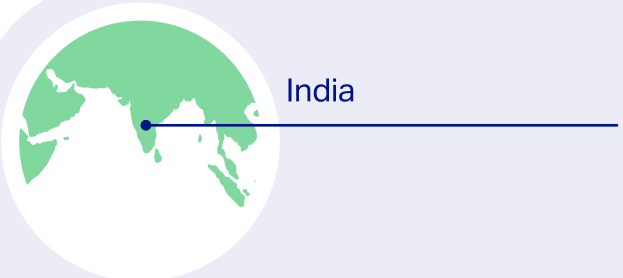
- **What are people eating** – e.g. meat consumption, vegetarianism?
- **Where are people eating** – e.g. home or, out (fast food, street food or car), and how often?
- **How much do people throw away?**
- **Where are people shopping for food** – e.g. farmers' market, corner markets, big box retailers, online – and if they go to the store, how do they get there?
- **What are they buying** – e.g. fresh ingredients, prepared meals, frozen, bakery? Do people buy specific items from different places? Where are they expected to shop in the future?
- **How much are people spending**, in absolute terms and as a portion of income?

*** We selected countries which are projected to have the largest growing middle class**

Note: the above questions are examples of the types of questions we explored; we did not find data for all of the above for each country

INDIA

Food profile



Context

India's population is projected to grow to 1.5 billion in 2030 and 1.7 billion in 2050 vs. 1.3 billion today.[1]

India has the largest youth population in the world (356 million); their eating preferences will define the future of food in India.[2]

[1] "World population prospects", UN, 2015
[2] "The Power of 1.8 Billion Adolescents, youth and the transformation of the future", UNFPA
[3] "India: Food Service - Hotel Restaurant Institutional", USDA Foreign Agriculture Service
[4] "Fast Food Market in India 2015-2020", Research and Markets, 2015
[5] "Industry Forecast – Food - India", BMI Research, 2017
[6] "India: Retail Foods", USDA Foreign Agriculture Service
[7] "On the 'Cancer Train' of India's pesticides", Al Jazeera
[8] "How India eats out", Live Mint
[9] "How India eats: Joint, not nuclear, families dine out the most", Live Mint
[10] "Grocery retailing in India", Economist, 2014
[11] "E-Grocery Market in India-Market Research 2015-2019", Technavio

Eating trends

While Indians traditionally tended to eat at home or at one of the >2 million street stalls/kiosks, people are dining out more and younger Indians are exploring more international franchises and foreign foods, driving growth in the restaurant sector (only 100,000 restaurants) at a CAGR of 10% by 2021 ($46.46 billion to $75 billion).[3]

As consumers' behavior and demography changes, the fast food market is projected to grow at a CAGR of 18% by 2020 (worth $27.57 billion).[4]

Demand for processed foods is growing with urbanization, rising incomes, and a young population.[5]

20-30% of India's population (which is 80% Hindu) lives on a vegetarian diet.[6]

Fears that cancer is caused by soil poisoning have increased awareness about sustainable agriculture and food, and there have been efforts to promote organic farming.[7]

Only about 27% of Indian households eat out each month, and it is estimated that only about 8-10% of food expenditures is spent outside the home.[3, 8, 9]

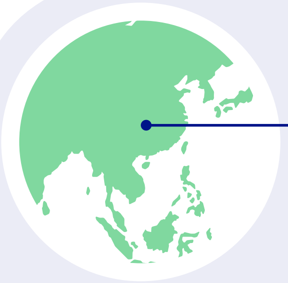
Purchasing trends

India's domestic retail grocers account for just 2% of food and grocery sales and are struggling to make a profit ($2.2 billion loss in 2014), since people prefer street stalls for the higher quality ingredients, customer service and convenient locations.[10]

Despite current struggles, the "e-grocery" market in India is expected to grow at a rate of 26% through to 2019.[11]

CHINA

Food profile



Context

China's current population of 1.38 billion is projected to reach 1.4 billion by 2022 and remain fairly constant until the 2030s, after which it is projected to decrease slightly.[1]

China's population is aging rapidly (10% was over 65 in 2015 and will double to 20% in 20 years) and is becoming increasingly more urbanized (60% by 2020).[2, 3, 4]

Eating trends

73% of Chinese actively make dietary choices to prevent health conditions and 82% indicated they are willing to pay more for foods without artificial flavors, preservatives, colors, sweeteners, antibiotics/hormones in meat, as compared to 68% globally.[5]

Due to recent food scandals, 71% of Chinese view food safety as a rising concern and, as a result, demand for imported food products is high.[6, 7, 8]

While grains make up a substantial amount of the Chinese diet, rising incomes and urbanization are shifting diets away from staple foods to protein and fruit. Per capita consumption of grain and cereal decreased 10% and 11%, respectively, from 2013 to 2015, while beef, mutton, poultry, eggs, melons and other fruit increased by 7%, 33%, 17%, 16% and 7%, respectively.[2, 8]

Purchasing trends

China's online grocery market far surpasses other countries ($41 billion in 2015 compared to the second largest market, UK, at $15 billion) and is expected to grow to $178 billion in 2020, as compared to second largest, UK, to $28 billion in 2020.[9]

While small convenience and specialty stores remain the most prominent retail model, larger supermarkets and hypermarkets are gaining ground, due, in part, to their ability to provide more affordable imported foods.[2]

1 "World population prospects", UN, 2015
2 "China Annual Retail Foods Report", USDA Foreign Agriculture Service
3 "China's Urbanization Plans Need To Move Faster In 2017", Forbes
4 "China's Aging Population Becoming More Of A Problem", Forbes
5 "New Eating Trends in China: The Healthier the Better", Nielson 2016
6 "The Modernization of the Chinese Consumer", McKinsey & Company
7 "What China's food safety challenges mean for consumers, regulators, and the global economy", The Brookings Institution
8 "China Food Processing Ingredients", USDA Foreign Agriculture Service, 2017
9 "China Dominates Global Online Grocery Markets", Institute of Grocery Distribution

BRAZIL

Food profile

Context

Brazil's population is expected to grow from 208 million in 2015 to 238 million in 2050.[1]

Brazil has a young population, with 48% of the population under 30.[1]

While the middle class grew by about 63% from 2002-2014 (80 million to 130 million), in 2015 the country experienced a significant reversal, with the number of poor and extremely poor Brazilian's growing by 6.5 million, and all middle class tiers shrinking.[2]

1 "Brazil Food & Drink Report", BMI Research
2 "Brazil's Middle-Class Dreams On Hold As Recession Hurts Households, IBT
3 "Meet the new Brazilian consumer", McKinsey & Company
4 "Four Key Food and Drink Trends for Brazil in 2016", Mintel
5 "Consumer Foodservice in Brazil", Euromonitor International
6 "Brazil: Market Fact Sheet", USDA Foreign Agriculture Service
7 "Brazil: Retail Foods", USDA Foreign Agriculture Service

Eating trends

A recent survey indicated that 42% of respondents chose to eat at home more in the past year to save money.[3]

Brazilian's are developing an increased appreciation for sustainable food measures, as 42% of the population indicated they experienced higher food prices, due partially to natural resource issues such as severe drought conditions.[4]

Although many Brazilians are health conscious, the ongoing economic struggles in the country mean there is increased demand for more lower-cost healthy alternatives.[4]

In 2015, dry grocery made up the largest share of food and beverage sales (20.9%), followed by meat (14.7%).[7]

Purchasing trends

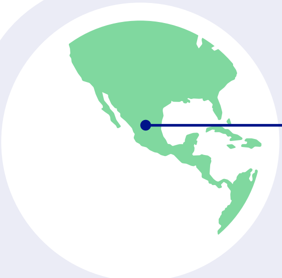
Despite the recession, Brazilians are still spending almost the same on eating out as they are on groceries ($133.8 billion versus $105 billion).[6]

Home delivery/takeaway has grown 20% due to its affordability over full-service restaurants.[5]

Growth of "cash & carry" store formats, which offer prices that are about 15% lower than other retailers, saw a major increase, as 1 million Brazilians switched from hypermarkets to "cash & carry"-style stores in 2016.[7]

MEXICO

Food profile



Context

Mexico's population is expected to grow from 127 million in 2015 to 163 million in 2050.[1]

The majority of Mexicans (~80 million people) have low purchasing power and/or live in poverty, thus driving much of their dietary choices – typically higher in carbohydrate rich foods and very few proteins.[2]

1 "World Population Prospects", UN 2015
2 "Mexico: Food Trends and Opportunities", Switzerland Global Enterprise
3 "Food & Grocery Retailing in Mexico- Market Summary & Forecasts", BMI Research
4 "BMI Industry View - Mexico - Q2 2017", BMI Research
5 "Industry Trend Analysis - Emerging Trends In Mexico's MGR Sector", BMI Research

Eating trends

In 2014, Mexico was ranked the world's most obese nation (32.8% adults); in response, the government imposed a sugar tax and issued guidelines for nutrition labeling.[3]

In 2014, packaged foods comprised 61% of all food and grocery retail sales, while unpackaged or fresh foods accounted for only 14% of sales.[3]

Despite being unaffordable for many Mexicans (see above), meat and poultry accounted for 30% of total food sales in 2015, followed by dairy (16%), bread, rice and cereal (14%) and fresh vegetables (12%).[4]

Consumption of healthy food is expected to increase due to rising incomes, better education and an expansion of urban lifestyles.[5]

Purchasing trends

Mexicans eat in restaurants on average 1.2 times per week; among the working class, this can reach as high as 4 times per week.[2]

In 2014, Mexicans shopped for food at convenience stores (35.4%), followed by hypermarkets, supermarkets and discounters (30.9%) and specialty shops (30.4%).[3]

While online retail is expected to grow by 22.3% from 2014-2019, this purchasing option is in an extremely nascent stage, with less than 1% of total sales in 2014. This is in part due, in part, to low internet penetration in the country (44.4%), low banking service penetration and poor logistical infrastructure.[3]

INDONESIA

Food profile

Context

Indonesia's population is expected to grow from 258 million to 322 million, 2015-2050.[1]

Half of Indonesia's population is currently under the age of 34.[2,3]

There here has been a substantial growth in the percentage of Indonesians entering the middle class (37% in 2004, up to 56.7% in 2013), which will drive more expensive tastes and demand for a wider variety of products.[2,3]

Eating trends

Rising health and hygiene concerns have raised the value that affluent Indonesians place on the source and quality of their food; this has in turn led to an increase in the sales of packaged food and bottled water.[1]

Bread, rice and cereals – with rice being the predominant category – account for 25% of total food sales; however, as incomes continue to rise, meat and dairy sales are expected to increase.[1]

With a population of about 88% Muslims, demand for halal-certified products is high.[1]

Purchasing trends

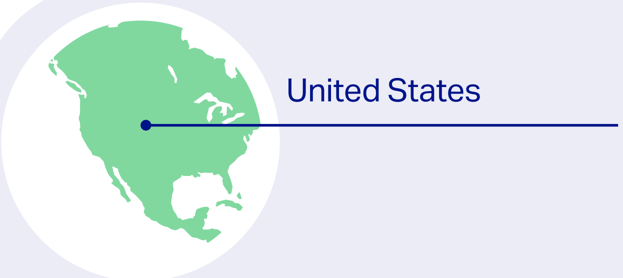
Traditional grocery retailers dominate the total locations and share of retail sales; however, convenience stores have seen rapid sales growth (30% increase from 2010-2015) as they have steadily grown the number of outlets (16.8% over the same period).[2]

Supermarkets and hypermarkets are also growing in popularity as they offer young, urban, affluent middle-class Indonesians more variety in product selection and services.[4]

1 "Indonesia Food & Drink Report", BMI Research
2 "Indonesia Retail Foods Report." USDA Foreign Agriculture Service
3 "Industry Trend Analysis - Youthful Middle Class", BMI Research
4 "Industry Forecast - Grocery Retail - Indonesia - Q1 2017", BMI Research

UNITED STATES

Food profile



Context

The U.S. population grew by 0.7% in 2015, the smallest annual expansion in 80 years; the population is expected to continue to age and become more diverse. By 2065, it is expected that there will be no be single racial or ethnic minority in the U.S.[2,9]

*** Sustainability, defined as "products that protect the environment, local communities and animal welfare." Some of the indicators in this research included locally produced (74%), sustainable packaging (69%), animal welfare (69%), non-GMO (67%), protects and renews natural resources (65%)**

1 "BMI Industry View - United States - Q1 2017", BMI Research
2 "10 demographic trends shaping U.S. and the world", Pew Research Center
3 "You Won't Believe How Much Processed Food Americans Eat", TIME
4 "What Farm-to-Table Got Wrong", The New York Times
5 "Dietary Guidelines 2015-2020: Eight Edition", U.S. Department of Health and Human Services and U.S. Department of Agriculture
6 "We Now Spend More At Restaurants Than at Grocery Stores", MONEY
7 "Adult Obesity Facts", CDC, 2016
8 "Why Americans Lead the World in Food Waste", The Atlantic, 2016
9 "USA Population Growth", The New York Times, 2016

Eating trends

63% of American's daily calories come from "ultra-processed" food.[3]

In 2014, 80% of Americans indicated that sustainability* is a priority when purchasing food and millennials have exhibited a higher preference for organic products.[1,4]

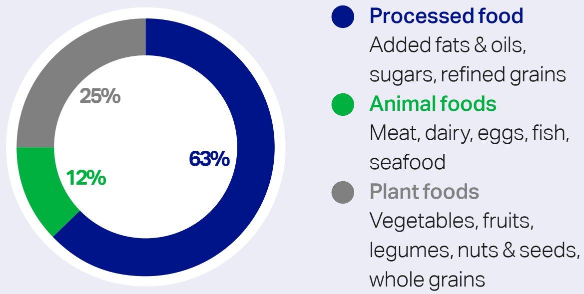
75% of Americans have diets low in vegetables, fruits, dairy, and oils; more than 50% are meeting or exceeding total grain and total protein recommendations, and most exceed the recommendations for added sugars, saturated fats, and sodium.[5]

Meat and poultry made up the highest proportion of food sales in 2015 with 37% of all sales, followed by dairy (12%) and fresh vegetables (9.6%).[1]

34% of American adults and 16% of children and adolescents are obese.[7]

30%-40% of food produced in the U.S. goes to waste; according to the National Resources Defense Council, the annual cost of food waste to the average household is $1,500.[8]

U.S. Food Consumption as a % of calories



Purchasing trends

Americans are spending more on food in restaurants than on food at home.[6]

Millennials' demand for convenience is driving e-commerce sales for food.[1]

Food is cheaper in the U.S. than in many parts of the world due to large government agricultural subsidies in favor of the corn, soybean, milk, and wheat industries.

ABOUT WBCSD

The World Business Council for Sustainable Development (WBCSD) is a global, CEO- led organization of over 200 leading businesses and partners working together to accelerate the transition to a sustainable world. WBCSD helps its member companies become more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

WBCSD member companies come from all business sectors and all major economies, representing combined revenues of more than US$8.5 trillion and 19 million employees. The WBCSD global network of almost 70 national business councils gives members unparalleled reach across the globe. WBCSD is 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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About this Report:

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Contact:

Julian Hill-Landolt,
Director, Sustainable Lifestyles
hill-landolt@wbcsd.org

World Business Council
for Sustainable Development
Maison de la Paix
Chemin Eugène-Rigot 2B
CP 2075, 1211 Geneva 1
Switzerland