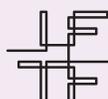


EATING FOR CHANGE

How food will transform daily life over the next decade



INSTITUTE FOR THE FUTURE

FOOD
FUTURES LAB | ifforg

ABOUT

INSTITUTE FOR THE FUTURE

Institute for the Future (IFF) is an independent, nonprofit 501(c)(3) strategic research and educational organization celebrating nearly 50 years of forecasting experience. The core of our work is identifying emerging trends and discontinuities that will transform global society and the global marketplace. Our research generates the foresight needed to create insights that lead to action and spans a broad territory of deeply transformative futures, from health and health care to technology, the workplace, learning, and human identity. As an educational organization, IFF strives to comply with fair-use standards and publish only materials in the public domain under the Creative Commons 4.0 International License (CC BY-NC-ND 4.0). Institute for the Future is based in Palo Alto, California. (www.iff.org)

THE FUTURE 50

This work is supported in part by IFF's Future 50 partnership—a circle of future-smart organizations that think strategically about near-term choices to reshape the long-term future. Future 50 draws on a half century of futures research from our labs focusing on society and technology, the economy and the environment, food and health. Its goal is to create the perspectives and expert viewpoints, the signals and the data, to make sense out of disruptive forces in the present. Grounded in a framework of Foresight-Insight-Action, the Future 50 partnership invests in critical research, boundary-stretching conversations, and strategic experiments that will shape the business, social, and civil landscapes of tomorrow.

FOOD FUTURES LAB

IFF's Food Futures Lab identifies and catalyzes innovations with the potential to reinvent food systems, drawing connections across global disruptive shifts to challenge assumptions and reveal emerging strategies for resilience in a rapidly changing world.

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CONTENTS

1 INTRODUCTION

Food as a Medium for Transformation

- 2 The Current Context
- 4 Research Methodology

5 IMAGINING THE FUTURE

Eating for Change in the Next Decade

- 7 Nourishing Bodies and Minds
- 17 Rebuilding Trust
- 27 Seeking Justice
- 37 Aligning with the Environment

INTRODUCTION

Food as a Medium for Transformation

Eating for Change is an in-depth look at the future of a food movement that has been in the making for decades. Like all movements, it started with a small group of passionate people who challenged the status quo—in this case, across agriculture, health care, and gastronomy.

At school gardens and urban community farms, these disruptors leveraged financial, social, political, and natural resources to create new models for local food systems. Along the way, technological innovators and social entrepreneurs joined the cause, and these local efforts started to scale up as people shared practices across global food innovation networks. Today these engaged eaters are transforming the marketplace, impacting even the most established global brands and food industry stakeholders. Over the next decade, their influence will expand beyond food systems to address concerns regarding health, trust, justice, and environmental stewardship. Food will be a medium for transforming all aspects of daily life. We call this eating for change.

As we look to the future, it's clear that people beyond start-up founders, chefs, and food scientists will need to adapt their food practices for change. The next decade will ask all eaters to redefine what good food means, as global forces—public health epidemics, political volatility, social inequities, and climate change, to name a few—shape the ways we formulate, produce, market, and eat food. More people are taking a seat at the table and leveraging the connections between food practices and challenges in the world around them. They're realizing that food, more than pharmaceuticals, can contribute to a healthy body and mind. They're using meals to bring disparate groups together and food media to spread messages of hope. Eaters for change are reengineering food environments for social equity and adapting traditional recipes to mitigate climate change impacts. We can look to today's leading-edge practices to gain a view into the needs, values, and behaviors of eaters for change in the coming decade.

Grounded in ethnographic research into today's eaters for change in cities from Shanghai to San Francisco, this report covers **four aspirations** for Eating for Change. It contains **eight forecasts** about how people will use food in the next decade to nourish bodies and minds, rebuild trust, seek justice, and align with the environment. Each forecast includes **three signals of change**—technologies, practices, partnerships, and approaches in the present that point to new directions for the future. We introduce **four future personas** that bring to life stories we uncovered from around the world, with a focus on the tools and environments that will shape possibilities for eating for change in the future.

The challenge for food companies, city planners, and regulators is to translate these articulations of what's important and what's possible into new products, services, and experiences that meet eaters' needs and aspirations. For all of us, the daily act of eating can be a part of a strategy for making a more resilient and equitable future.

The Current Context

Before we can forecast how people will be eating for change, we need to understand why they will be doing it. An accumulation of social, technological, environmental, economic, and political changes are creating new imperatives for the food system and setting the context for new behaviors to emerge. Many of these drivers have been playing out for decades. Some of today's drivers are the consequences of past design choices about our food system. Others are creating both challenges and opportunities for designing our food system of the future. As more eaters look to food as a medium for transformation, they will want to have food experiences that address multiple concerns and create change across all of these domains.

Global health burdens create demand for non-harmful foods.

The future of health is full of concerning metrics: rising global obesity rates coincide with high rates of food insecurity and starvation, even in developed economies. An aging population with a high disease burden is driving health care costs toward an even higher percentage of GDP around the world. The 2016 Global Burden of Disease Study found that poor diet is a factor in one in five deaths globally.¹ And beyond physical health, an "epidemic of loneliness" means many people are experiencing social isolation and depression.² People are seeking a more holistic approach to mental, physical, and spiritual health. Food will be central to this strategy.

Eaters want food companies to be held accountable for the outsized impact diet has on chronic disease. A recent study found that 70 percent of people believe that policy makers should tax foods that negatively impact health.³ However, nutrition advice remains contested and increasingly mired in food industry lobbying efforts. Eating for change will be driven by a demand for trustworthy information and a determination to consume foods that help, not harm, the body and mind.

“ The real problem of food production occurs within a complex, mutually influential relationship of soil, plants, animals, and people. A real solution to that problem will therefore be ecologically, agriculturally, and culturally healthful.”

—WENDELL BERRY,
AUTHOR, FARMER, AND ACTIVIST

A global crisis in trust creates a vacuum for new authorities to enter.

We are experiencing a profound global crisis in trust. So-called fake news, international business scandals, and ongoing globalization and technological changes have eroded trust across all major institutions. The 2017 Edelman Trust Barometer found that only 15 percent of the general population believe present systems—government, media, business, and NGOs—are working. In this environment, people are seeking honesty and transparency more than ever before. This creates an opportunity for business to take action and for new authorities to define alternative systems of trust. Three out of four general population respondents in Edelman’s study “agree that a company can take actions that both increase profits and improve the economic and social conditions in the community where it operates.”³

Trust is particularly important with food, where the stakes are so high, involving no less than an eater’s health and safety. Reading a piece of fake news may leave you feeling uneasy, but eating a piece of fake food can actually kill you. Food companies have an opportunity to step forward and reestablish trust by truly acting in the best interests of their eaters. With an ever-growing population of skeptics, it will be important to seize the opportunity before it’s too late.

Growing unrest and inequality turn more eaters into activists.

In 2010, the 288 richest people in the world collectively owned as much as the poorest 3.5 million. Less than a decade later, just eight men owned as much wealth as the poorest half of the world’s population.⁴ This extreme inequality has been the backdrop for a decade of volatile political unrest, violent terrorist attacks, resurgent nationalist movements, and divisive and unpredictable actions by political leaders. The year 2017 saw growing numbers of people take to the streets to protest racism, xenophobia, and income inequality, birthing the meme “protest is the new brunch.” Political activism, inherently about system change, is cementing itself into the social fabric of the next decade, and those who may have been complacent in the past are looking for ways to get involved. Everyday food choices will become an avenue for people to express resistance and enact their values. This will transform eating from an act of consumption into an act of changemaking.

Global and local efforts emerge to accelerate climate-resilient agriculture.

Higher temperatures, record droughts, and rising sea levels make clear that we’re reaching the ecological limits of current models of food production and consumption. Agriculture, forestry, and other land uses contribute 24 percent of global greenhouse gas emissions, not including impacts of the energy required to transport and store food.⁵ New research on “nutrient collapse” is revealing unexpected consequences of higher atmospheric CO₂ levels: our edible plants contain more sugar and fewer nutrients than they did a few decades ago.⁶ Efforts to reduce dependence on animal-derived food, create regenerative

““ Food touches on just about every single issue that matters. Being interested in food, really caring about it, has a domino effect. You start caring about where it comes from, what it means to the people you are feeding, and what it means to be fed.”

—JULIA TERSHEN,
AUTHOR, *FEED THE RESISTANCE*

farming practices, build indoor food production systems that use fewer resources, and shift eaters' tastes toward climate-friendly diets have stimulated innovation across the food web. Over the next decade, the new discipline of planetary health will increase understanding of the interdependencies between humans and the natural systems around us.⁷ This will drive innovations that align efforts as disparate as urban food system planning, carbon sequestration, and food waste reduction under one cause—human and planetary resilience.

In aggregate, these future forces will combine to greatly expand the aspirations and demands that eaters bring to every food choice. They will shape the contexts in which people will adopt technologies, adapt food practices, and engage in eating for change.

Research Methodology

Informed by the future forces just discussed, we conducted this research using **anticipatory ethnography**, a qualitative approach that blends the tools of ethnographic inquiry with futures methods to contextualize today's leading-edge behaviors and practices within forecasts of technological and social change. With this approach, we aimed to identify the values and emerging needs in today's food environment that are likely to have a broader impact in the next decade.

Our research included thirty in-depth ethnographic interviews with eaters, farmers, food writers, activists, and chefs around the world ranging in age from twenty-three to sixty. We sat down at dining room tables in Shanghai and San Francisco. We visited a food media production studio in Seoul, farms in the rural American South, and restaurant kitchens in Spain. We selected participants who are managing complex health challenges for themselves or their families, actively engaged in local social justice efforts, and experimenting with new business models and new technologies to make good, safe food. Quotes from these people appear throughout the report. In some cases they have been edited for context or English language clarity.

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1. Global Burden of Disease Study 2016, *The Lancet*.
 2. Moya Sarnar, "Feeling lonely? You're not on your own," *New Scientist*, 19 July 2017.
 3. Edelman Intelligence, 2017 Edelman Trust Barometer.
 4. "Just 8 men own same wealth as half the world," Oxfam International, 16 January 2017.
 5. Intergovernmental Panel on Climate Change, *Climate Change 2014: Mitigation of Climate Change*.
 6. Helena Bottemiller Evich, "The great nutrient collapse," *Politico*, 13 September 2017.
 7. The Rockefeller Foundation–Lancet Commission on Planetary Health, "Safeguarding Human Health in the Anthropocene Epoch," 25 July 2015.

IMAGINING THE FUTURE

Eating for Change in the next decade



NOURISHING BODIES AND MINDS

FROM FOOD AS A RISK FACTOR TO
FOOD AS A CATALYST FOR WELL-BEING



REBUILDING TRUST

FROM ERODED BRAND CREDIBILITY TO
TRANSPARENT, DIGITAL FOOD STORIES



SEEKING JUSTICE

FROM FOOD AS A COMMODITY TO
FOOD AS A HUMAN RIGHT



ALIGNING WITH THE ENVIRONMENT

FROM CLIMATE-DISRUPTIVE TO
REGENERATIVE AGRICULTURE AND EATING

Eating for Change by

NOURISHING BODIES AND MINDS

“**What I’m seeking is not a solution for now. I’m seeking a solution for my whole life.**

Because I may meet this problem again and I need to make sure that I have found the reason at the root instead of just a superficial reason. I think in the future people will be more curious about this kind of thing.”

—MOM AND ENTREPRENEUR,
EARLY 30’S, SHANGHAI, CHINA

FROM FOOD AS A RISK FACTOR TO FOOD AS A CATALYST FOR WELL-BEING

A decade ago, journalist Michael Pollan called the Western diet “the elephant in the room”—the obvious problem affecting public health that no one wanted to discuss or challenge. Today, more people are realizing the dire consequences of diets heavy on meat, refined sugar, and unhealthy fats.

Diet is now the second-highest risk factor for premature death, greater than tobacco use. People are living longer, but they’re not necessarily living well; diabetes and obesity are decreasing quality of life for people across the socioeconomic spectrum. Managing these diseases is squeezing health care budgets, and new awareness of food risks is creating anxieties for eaters around the world. Right or wrong, eaters are drawing links between their food choices and a much wider array of health and well-being issues.

The challenge we face at the global scale is daunting, yet people who are eating for change are already showing us ways in which food will be front and center in remaking our bodies. The tools to evaluate the relationship between food and health are expanding beyond the hands of experts to the hands of everyday people. Well-connected eaters from China to rural Georgia in the United States

are leveraging communication technologies to gain access to information that enables them to become their own health authorities. New multidisciplinary research efforts and coalitions are elevating awareness of food as a potential healer of bodies and also of minds and spirits, long a dream of community health practitioners and activists.

Today’s early signals indicate how digital and AI-embedded technologies, evidence-based behavioral science, and policy will come together to disseminate these strategies more widely. With more tools and information available to us than ever before, we can expect in the next decade to advance our quest to shift paradigms from food as a cause of suffering to food as a catalyst for well-being. As we seek to address the roots of our health challenges, not just the symptoms, food may be our most powerful lever for change.

Poor diet increases risk of early death

Diet is now the **second-highest risk factor of early death**, greater than tobacco use.



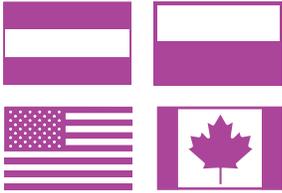
One in five deaths globally is related to diet.

Global Burden of Disease Study 2016, *The Lancet*.

Globally, people are worried about health care

23% of adults surveyed in twenty-five countries are **more worried about health care** than terrorism, education, and climate change.

Health care was the **top source of worry** in Hungary, Poland, the United States, and Canada.



"What worries the world," Ipsos MORI, February 2017.

Eaters are seeking foods that optimize well-being

Google searches for **"BEST FOODS FOR ____"** **↑10X** in the U.S. between 2005 and 2016

Popular searches include **foods best for** acid reflux, upset stomach, skin, energy, and the brain.

"2016 Food Trends from Google Search Data: The Rise of Functional Foods," Think with Google, April 2016.

HIGH-RESOLUTION HEALTH

Toward new information authorities and emerging food anxieties

TODAY

We've all had the experience of wondering if we are eating food that is safe and healthy for our bodies. While advances in industrial food safety, processing, distribution, and labeling have reduced the uncertainty of eating for many around the world, the rise in food allergies and chronic diet-related disease is introducing a new set of risk considerations that eaters will need to navigate in the next decade. In recent years, the information environment around food and our bodies has also dramatically changed, opening up access to high-resolution personal information and illuminating new opportunities for intervention. Eaters will be equipped with tools and data to help them analyze and mitigate risk across a host of personal metrics and needs.



If I'm looking for scientific information, I look at scientific peer-reviewed articles, a number of them, and then I compare and contrast. Sometimes it takes ten articles for me to make my own opinion about what's going on. In the last two or three years since I began researching what goes into food and how it's made, I have realized how empowering that is."

—CANCER PATIENT AND MOTHER OF CHILD WITH SEVERE ALLERGIES, 31, SAN JOSE, CALIFORNIA

SIGNALS



Source: siftfoodlabels.com

WHAT?

The Sift Food Labels app, created by a woman who suffered gestational diabetes while pregnant, helps eaters decode food labels. Users scan labels and barcodes, and Sift checks against a database of more than 400,000 ingredients to simplify scientific terms and flag ingredients such as added sugar that don't align with the eater's diet profile.

SO WHAT?

Eaters will expect ingredients and nutrition information to be understandable and meaningful—the right balance of simplification and personalization—whether printed on a box or displayed via augmented reality.



Source: nimasensor.com

The portable Nima sensor verifies if foods contain gluten at the point of consumption. Thousands of Nima users form a bottom-up verification network for restaurant menus and packaged foods, and one-third of the user tests have found that foods labeled or called "gluten free" actually are not.

To combat food disinformation, people will dig deeper into the science, using new low-cost sensing tools to crowdsource networks of data and verification.



Source: US Food and Drug Administration (FDA), "FDA allows marketing of first direct-to-consumer tests that provide genetic risk information for certain conditions," 6 April 2017. Image Source: 23andme.org

The marketing of genetic health risk reports by 23andMe, one of several direct-to-consumer genetic testing companies, was approved in April 2017 by the United States Food and Drug Administration (FDA). Such reports identify whether a person carries genetic markers for various diseases, including celiac disease, so that they can understand their risk and take preventive steps.

While access to this information can feel empowering, it can also create confusion when not used with the guidance of a professional. There will be increased chances of misinterpretation, a false sense of immunity from a particular disease, and even exploitation as new products and services claim benefits that may not be true for a given individual.

FUTURE DIRECTIONS

Today's leading-edge eaters are piecing together their own personal food systems to mitigate risk in a fragmented food and well-being economy. Many are spending hours digging through medical journals to form their own conclusions about the foods their body needs and using exploratory genetic testing tools. As health information expands beyond doctors' offices and into our smartphones and smart homes, more eaters will leverage emerging tools to track metrics that matter to them, seek hyperpersonal information and advice, and leverage online social networks to seek counsel from peers. Already, stakeholders including food companies and regulators are struggling to play catch-up to address fears related to food and obesity. As eaters draw more personalized links to relationships between food choices and health problems, new opportunities will emerge to alleviate these anxieties and transparently engage consumers.

DIGITAL FOOD THERAPISTS

Toward AI-powered, personalized food coaching

TODAY

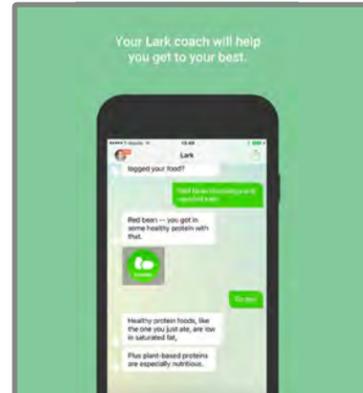
In Chinese medicine, the practice of *shi liao* (food therapy) consists of incorporating various foods with medicinal properties into the diet for their preventive and therapeutic effects. At the core of this practice is a view of food that looks beyond just its nutrients to its healing powers. Leading-edge eaters are adapting their practice of food therapy to the twenty-first-century context of speed, convenience, and overwhelming complexity. They're adopting an attitude of experimentation, creating feedback loops with fitness trackers and nutrition apps, building mindfulness practices into eating, and cultivating a mindset of change. It's hard work, but eaters are pioneering a host of tools to reorient their personal eating practice toward health and well-being.



I use apps to track my health. I have one that reminds me to eat and it asks me how I'm feeling from each of my meals. Do I feel like I've learned something about myself by tracking? Oh, yes. Absolutely."

—FILM PRODUCER AND ENTREPRENEUR,
39, SAN FRANCISCO, CALIFORNIA

SIGNALS



Source: lark.com

WHAT?

Lark is an app that leverages AI to provide a personal behavioral coach uniting the physical, mental, and emotional aspects of wellness. It uses chatbot technology to prompt users to track how they feel after meals, provide dietary feedback, and suggest foods to eat in addition to tracking sleep, stress management, and medication.

SO WHAT?

Virtual assistants will prompt us to adopt rituals that create feedback loops and will offer advice, becoming a marketing platform for brands and exacerbating eaters' calls for algorithmic transparency.



Source: Felice N. Jacka et al., "A randomised controlled trial of dietary improvements for adults with major depression (the 'SMILES' trial)," *BMC Medicine*, 30 January 2017. Image Source: defense.gov

With the **'SMILES'** trial, the first randomized controlled trial to explicitly explore the question "If I improve my diet, will my mental health improve?", a group of researchers in Australia found that following a healthy diet, setting goals, and receiving mindful eating training with the help of a clinical dietician led to significantly better outcomes than traditional interventions for depression.

A growing body of evidence will bring together physiological and mental health outcomes, forming wellness strategies that extend beyond nutrients themselves to sustainable behavior change.



Source: fimcoalition.org

The Food is Medicine Coalition aims to use food policy and research to ensure that no one suffers from both hunger and chronic illness. It advocates for medically tailored food and nutrition services—which account for the person's illness, allergies, medications, and socioeconomic circumstances—to be included as a core component of health-care delivery.

Public-private partnerships will work across traditional boundaries to increase access to and affordability of food that's healthy and personalized for the most vulnerable eaters.

FUTURE DIRECTIONS

We will see a proliferation of technology-mediated coaching efforts aimed at expanding healthy food practices across larger populations for a variety of outcomes—not just physical health but also greater productivity and creativity in the workplace and improved community health. The rise of AI-powered personal virtual assistants will make dietitians and behavioral scientists available at our fingertips, while new evidence will support strategies that combine healthy food with behavior change coaching. Advocacy groups will seek new partnerships and policies to leverage these technology-based strategies to address the pressing need to heal both bodies and communities. Still, our ability to measure many health and well-being indicators will remain crude. As our experience of our own bodies is mediated by consumer technology, eaters may struggle to balance the sensory experience of eating with the food choices dictated by metrics.

SOPHIA SILVA

Defining a healthy food practice

Age in 2027: 15

Location: São Paulo, Brazil



Like most teenagers, Sophia is trying to establish her own habits and sense of identity, especially with food. But this coming-of-age process is complicated by the foodscape she lives in and what she knows about her health. A new program at school may help her define her own healthy food practice.

Since discovering that she has genetic markers for late-onset Alzheimer’s disease at a school health day, Sophia is on a mission to understand how her lifestyle choices might reduce the risk. The news is complicating her already complex personal food system. Sophia has to be careful to avoid cow’s milk and peanuts, severe allergies she’s had all of her life. Also, she doesn’t always have access to the recommended fruits and vegetables at her family’s house in the crowded city. She’s also worried about her mother’s recent diabetes diagnosis, common among adults in her neighborhood, and wants to learn how to encourage her mom to eat better too.

Sophia and her mom have always loved going to the *feira* in her neighborhood and eating *pastel*, a pocket of deep-fried dough filled with meat, followed by chocolate *brigadeiros* for dessert. But she’s starting to wonder if this weekly ritual of high-sugar and high-fat foods is actually contributing to both her and her mother’s health problems. School plays an important role in her relationship with food, as it does for many of her peers. She’s started choosing from the school’s plant-based meals more often, and she likes that a good portion of the food comes from local farms—her grandparents and great-grandparents were farmers, after all. She’s not sure if the foods she

eats will do much to reduce her risk of developing Alzheimer’s, but the painful memories of her grandmother’s struggles with the illness are enough to motivate Sophia to try anything.

Today, she’s starting a new program at school called BemEstudar—acknowledging the intimate connection between being well and being a good student—that helps her track what she eats, how she feels each day, and her performance in school. Always an engaged student, Sophia hopes the combination of diet, health, and exam data will help her learn how to keep her brain healthy in the years to come. A wearable tracker connects to her mobile phone and keeps tabs on her biometrics and sleep and sends information to Sophia’s BemEstudar personal AI assistant and to her parents so they can help Sophia be at her best. BemEstudar alerts her when a menu item contains milk or peanuts so she’s sure to avoid an allergic reaction that might cause her to miss class. Sophia’s favorite part of the entire day is the fifteen minutes her teacher gives her class right after lunch to write about what they ate and how they feel. She hopes this practice will make her more aware, and—in partnership with the technology on her body—able to establish a food practice that makes her feel good for the long run.

INSIGHTS

Eating for Change by Nourishing Bodies and Minds

Personalize and simplify information

As eaters seek to become their own health authorities, they will expect information about food that is meaningful to them on a highly personalized level, from allergens to potential interactions with medication. Leverage storytelling techniques and tools such as augmented reality to simplify complexity and ensure understandability.

Integrate into digital ecosystems

Virtual assistants will mediate many aspects of eating, from suggesting foods to enabling feedback loops. As AI becomes an infrastructure for informed eating, ensure data about your products and services is included in the digital ecosystem these virtual assistants access.

Transform both health and food spaces

Eaters are using food as a tool for health and well-being, but many hospitals, doctors' offices, and pharmacies are not meeting demands for eating advice or access to healthy food. View the two as parallel distribution systems by putting health tools and resources in food spaces and vice versa.



You have to be curious. I feel like I'm never settled by what I see or what I know. I just think you have to be curious, and you have to have a desire to care about people other than yourself. If I'm only worried about me, then it doesn't really work. I feel like it's a level of curiosity and care, humanity."

—DIABETES EDUCATOR AND ACTIVIST
23, OAKLAND, CALIFORNIA

Eating for Change by

REBUILDING TRUST

“ In China especially,
you can't trust the big brands.

But all these unbranded moms [selling food on WeChat], they are making this food for their family. She is eating it every day and you see her as your friend. You can go to your friend's home to have a dinner with them and you do not ask for her license, right?”

—MOM AND ENTREPRENEUR,
EARLY 30'S, SHANGHAI, CHINA

FROM ERODED BRAND CREDIBILITY TO TRANSPARENT, DIGITAL FOOD STORIES

In a world flooded with so-called fake news, counterfeit foods, and nutrition advice that often conflicts and confuses, eaters are looking for new ways to establish trust. As individual relationships with farmers and cooks waned over the last century, eaters outsourced this trust to brands and regulators.

Now trust in institutions and companies across all industries is at a historic low, and the locus of trust is once again shifting back to individuals. The 2017 Edelman Trust Barometer found that globally, “a person like yourself” is considered as credible as an academic expert—and far more credible than a CEO or government official.

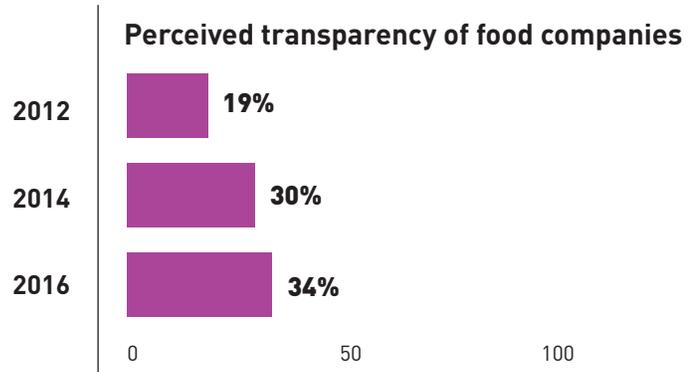
The internet is enabling the proliferation of online peer-to-peer food communities formed around life stage, culinary heritage, and dietary profile. Young people in China are using the messaging platform WeChat both to exchange information about food and to buy food products from each other. Young urbanites are opening their homes for shared meals booked through apps like Feastly and EatWith, and restaurant owners are using food as a way to bring otherwise adversarial groups together. Social media and digital platforms will become the go-to places for

information about food, creating both challenges and opportunities for food companies. By encoding more transparency into the supply chain, food companies can provide individual influencers with more detailed and more reliable information about their products.

On the flip side, misinformation will also spread faster and farther than ever before, as witnessed around the world during recent political campaigns. The internet has paved the way for niche groups to create divisive narratives, and doubts about the trustworthiness of food information will be exacerbated by sophisticated strategies to manipulate online communities. As more of our food-information-seeking activities happen online, echo chambers and autonomous bots will confound our efforts to glean reliable data. But even in the face of this possibility, food will become an important avenue to reestablish trust both online and at the table.

Trust in food companies remains low

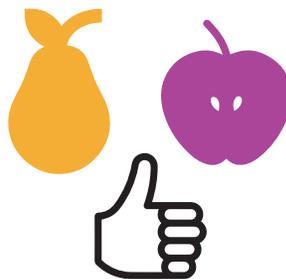
Despite recent progress in perceived transparency, overall **opinions of food companies remain low** in the United States.



FoodThink, "Evolving Trust in the Food Industry," Sullivan Higdon & Sink, 13 March 2016.

Eating the same food establishes trust

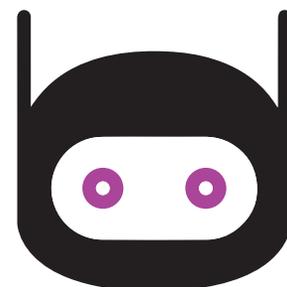
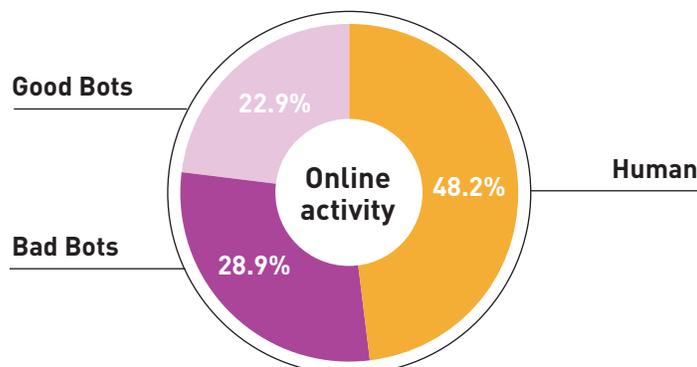
Strangers who eat similar foods are **more trusting of each other**.



Consumers are **more trusting** of information about non-food products when the advertiser in the product testimonial **eats food similar to what they eat**.

Kaitlin Woolley and Ayelet Fishbach, "A recipe for friendship: Similar food consumption promotes trust and cooperation," *Journal of Consumer Psychology* 27 January 2017.

It's hard to know who to trust when half of the internet is bots



Igal Zeifman, "Bot Traffic Report 2016," Imperva Incapsula, 24 January 2017.

TAMPER-PROOF TRANSPARENCY

Toward technologies that let food speak for itself

TODAY

From Shanghai to San Francisco, participants in our ethnographic interviews describe the laborious effort it takes to truly trust their food. Many eaters express extreme mistrust of most food brands. Some won't eat food unless they've visited its farm of origin, while others spend hours poring through online forums for advice about food safety. Even with these time-consuming practices, uncertainty lingers: Is this food actually safe to feed my family? Is its production worsening environmental and social problems? Globally, one in ten people fall ill as a result of contaminated food, and an estimated 10 percent of the global food supply is adulterated. People want a clearer view into an opaque system.



We're not a Fortune 100 company that can invest in a billion dollars of advertising. On the optimistic side, Chinese people learn really fast. They leapfrog so many things. And because they're so scared now, they will be more willing to spend more time digging on the internet looking for the right information."

—FOUNDER OF ORGANIC ONLINE FARMERS MARKET, 34, SHANGHAI, CHINA

SIGNALS



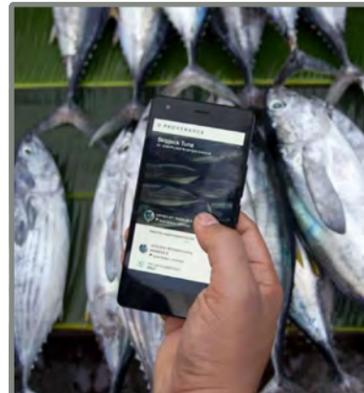
Source: ibm.com/blockchain

WHAT?

IBM's blockchain team is partnering with food companies, including Dole, Kroger, Nestlé, Tyson Foods, Unilever, and Walmart, to identify new areas where blockchain technology could bring greater trust, transparency, and safety to food supply chains.

SO WHAT?

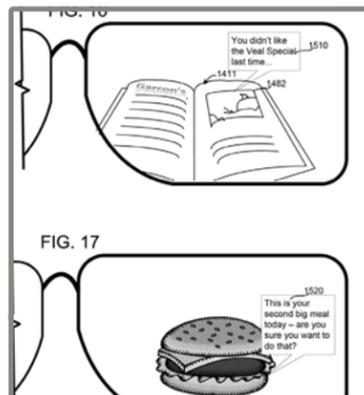
Food safety will not be a competitive advantage. Open-source collaborations among major food and technology companies will accelerate the pace of blockchain implementation.



Source: provenance.org

Provenance is a platform that gives physical products a digital story. The company is creating an open traceability protocol on the blockchain to encode an auditable record of any ingredient or product, as well as providing tools to help brands turn that data into stories about their products.

Media-rich storytelling will convey complex supply chain information to consumers in a compelling way. Stories will replace today's third-party certifications and will be increasingly accessible to eaters at the point of purchase, in a browser or in augmented reality.



Source: US Patent Office, US20140147829 A1

A **wearable food nutrition** feedback system was patented by Microsoft. A head-mounted display will recognize a piece of food or packaging and provide relevant information, such as nutritional content or reviews from friends and trusted advisors.

Augmented reality apps will redefine the food label as a digital layer of advice and opinion from a network of experts and peers. This creates new mediums to tell a food's story but also will enable misinformation to spread faster.

FUTURE DIRECTIONS

Information about food is now gleaned from a brand's marketing and packaging, proxies such as third-party certifications for organic and fair trade, and social networks that are quick to share opinions that may or may not be true. In the next decade, a piece of food itself can become a trusted primary source of information. Distributed computing systems such as the blockchain will create a tamper-proof digital ledger of transactions that can answer questions about where the food came from, if it was kept at a safe temperature, and what production methods—including labor practices and genetic modification—were used. Augmented reality will make this layer of information available in any context where a food decision is made. This may help reduce food fraud (which is estimated to cost the industry more than \$40 billion annually) and also reestablish trust among skeptical eaters.

COMPUTATIONAL FOOD PROPAGANDA

Toward food media that breaks—or reinforces—filter bubbles

TODAY

From centuries-old halal and kosher dietary traditions to today’s vegan regimens, eaters have always used food to express their identification with groups. Yet in today’s hyperconnected world, identity formation and expression is being dramatically reshaped by highly personalized information flows. Our media diets are becoming unbalanced through targeted online ads and filter bubbles, with impacts on real-world decisions and events, and thus the internet has begun to reveal itself as a complex amplifier of stratification. Leveraging these digital tools, people will tap into the shared human experience of food with stories to bring people together—or to propagate polarizing views. Others will use the ritual of breaking bread together as an antidote to increasing polarization.



Our diet is not just about what we consume foodwise, it’s about what we consume in the media, what we consume from our friends, what we consume on social media. Those things are all interconnected, and they all have to work together for the greater good of everybody.”

—DIABETES EDUCATOR AND ACTIVIST,
23, OAKLAND, CALIFORNIA

SIGNALS



Source: theperennialplate.com

WHAT?

Resistance Through Storytelling is a project by American filmmaker Daniel Klein that creates short documentaries about immigrants and refugees cooking in their homes. The project then leverages social media advertising platforms to intentionally target these films to people who are less likely to be exposed to positive stories about immigrants and refugees.

SO WHAT?

Grounded in a shared human experience, food stories will be used to break the cycle of online political and ideological echo chambers.



Source: Nicky Woolf, “Coca Cola pulls Twitter campaign after it was tricked into quoting Mein Kampf,” *The Guardian*, 5 February 2015.

In response to a **Coca Cola Twitter campaign** that automatically replied to negative tweets with happy images, a group of journalists created a countercampaign that used a bot to trick Coca Cola into tweeting text from Adolf Hitler’s Mein Kampf.

Originally created for marketing and branding, bots will be harnessed by people who seek to create division by pushing messages to unsuspecting publics, often behind the face of large food brands or celebrity chefs.



Hummus Bar, an Israeli cafe, offers a 50 percent discount on meals shared by Arabs and Jews. The owner wants to show how food can bring anyone together, even across centuries-old conflicts.

Although a single cafe in Israel won’t solve the region’s deep-held oppositions, such acts of shared food experiences will become even more important in a polarized world of divisive media.

Source: Daniella Cheslow, “Hummus diplomacy: Israeli cafe discounts meals shared by Jews and Arabs,” *NPR*, 23 October 2015.

FUTURE DIRECTIONS

Polarization impacts our food systems, with fierce debates—on such issues as genetically modified organisms, the advertising of processed foods to children, and fair wages—resulting in boycotts and policy changes. In the coming decade, computational propaganda will amplify the ability of online communities to shape our worldview. Autonomous bots and algorithmic messaging streams embedded in echo chambers will generate the illusion of popularity or dissent, leveraging highly specific identity markers and behaviors to reinforce beliefs or expose other points of view. Our online food identities—the brands we follow, the food photos we share, the recipes we search for, and the products we buy—will form the basis by which algorithms target messages of belonging or division. We are what we eat, and in this world, our food media consumption will become ever more important in shaping who and what we trust.



JIN LIU

Building trusted food networks

Age in 2027: 24

Location: Shanghai, China



Jin Liu spends his days working on-demand across many platforms. He might be a food delivery app driver, an on-demand urban farmer, a dinner host on the mealsharing app YiqiChifan, and a freelance marketing consultant all in the same day. Let's catch up with him as he gets ready to host his YiqiChifan guests.

Jin steps out of the stream of evening rush hour foot traffic and into a corner wet market to pick up some fresh scallions. He's making stir-fried *nian gao* (sticky rice cakes) and crab for the eight YiqiChifan guests who will be showing up at his apartment in a few hours. He has room for two more people, and he wants to fill those slots, so he starts livestreaming as he shops. Almost immediately, a few dozen people tune in, and viewers from Hong Kong to Hanoi start commenting about how they wish they could make it to dinner tonight.

Jin is excited to demo a new food safety scanning device that can test the pesticide and synthetic fertilizer levels on produce. Vendors now know that because of people like Jin, if their food is labeled organic, it better actually be true. Jin has built a loyal following across several food media platforms because he's known for his candor and willingness to talk about controversial topics. A few years ago, an agrichemical interest group tried to get his posts taken down by WeChat's Rumor Filter, but he was able to back up all his claims with solid data and debunk the fake news about his "fake news."

The first bunch of scallions he grabs gets a green light for parts per million of nitrate, indicating the scallions weren't grown with synthetic fertilizers. As Jin pays the vendor, he gets a notification that the last two spots have been booked and that one of them has a severe wheat allergy.

No problem! Tonight's rice cakes are homemade by a woman in Jiangsu Province. She started selling these on WeChat a few months ago, and even though they are more expensive than what Jin could find from a street vendor, he thinks it's worth it because she provides blockchain certification for the provenance of her rice flour. This kind of transparency is a big perk for YiqiChifan guests with allergies and has earned Jin a five-star ranking from three different crowdsourced allergen watchdog networks. He closes out the livestream for a few minutes as he hops on the train, but promises he'll be back in thirty minutes to teach them how to cook the *nian gao*.

INSIGHTS

Eating for Change by Rebuilding Trust

Provide honest and reliable packaging

Foods that put too much effort into persuasive packaging or advertising will be seen as suspect. People are growing increasingly skeptical of flashy marketing, especially directed at children, and instead want clear explanations of the complex health and environmental issues behind their food. Use packaging to clearly convey honest information. If you don't provide it, you can expect someone else to hack your brand's story.

Encourage eaters to verify your claims

The best way to build trust is to act trustworthy. Help eaters form bottom-up verification networks that leverage their access to tools for testing safety, allergens, or provenance. As blended, augmented reality tools become more available, use labels to convey layers of information. Favor an "open kitchen" approach that lets eaters see your process. And be ready to respond when misinformation goes viral.

Find ways for food to unite

Food has a unique power to bring unlikely people together. Think of your food products and experiences as platforms for building trust, encouraging exchange, and finding common ground. However, be aware that your brands' stance and digital communications on polarizing issues may be manipulated by those seeking to sow mistrust.

“ I try to do what I can to protect us. I think, for me, it's about knowing, being adequately informed about what I'm putting in my body. And feeling like I'm not all the time is frustrating. I just want to know.”

—CANCER PATIENT AND MOTHER
OF CHILD WITH SEVERE ALLERGIES,
31, SAN JOSE, CALIFORNIA

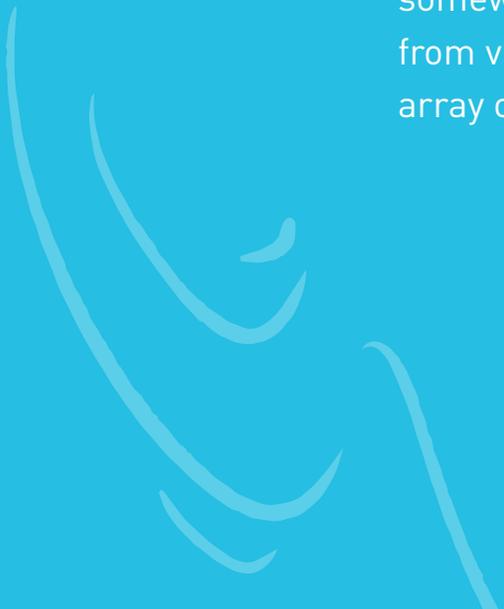


Eating for Change by
SEEKING JUSTICE

**“ My community just needs
a lot of resources.**

We need therapy sessions, we need farmer’s markets, we need affordable food, we need adequate housing, we need to be able to put our roots down somewhere and live there happily, free from violence. I mean violence in an array of ways.”

—DIABETES EDUCATOR AND ACTIVIST,
23, OAKLAND, CALIFORNIA



FROM FOOD AS A COMMODITY TO FOOD AS A HUMAN RIGHT

Across centuries, from pre-Revolutionary France to modern-day Egypt, protestors have taken to the streets to demand their right to affordable food. These so-called bread riots have used the issue of food to call attention to economic and structural injustices that prevent access to sustenance.

While today's food system has succeeded in creating an abundance of cheap calories, this has had unintended consequences: the food that we can produce and sell cheaply tastes good but is bad for us. Getting those costs low also causes real harm to those who produce our foods. Additionally, cheap food hasn't been the solution to global hunger. In 2016 the number of hungry people in the world increased for the first time since the turn of the century; more than 800 million people still don't have reliable access to food.

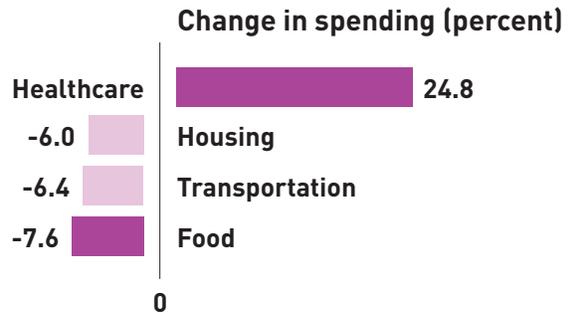
Food justice activists say that food isn't good for anyone unless it's good for everyone. However, "good food" means different things, depending on whether you are a public health official, a kid with type 2 diabetes, or a shareholder in a snack food company. For example, a 2017 study found that globally 70 percent of people believe that policy

makers should tax foods that negatively impact health. Yet soda taxes soda taxes are getting repealed just months after implementation in the United States, and Latin America's carbonated beverage sales have doubled since 2000. There's a turf war under way between public health activists, engaged eaters, and food companies for control of our food environments.

Looking beyond food boycotts and strikes, a new generation of food justice activists is creating new business models, new social contracts, and new government initiatives to ensure food as a universal right. These eaters see the connection between food and economic inequality, chronic disease, and environmental degradation, and they are focusing on this interconnectedness to find solutions that simultaneously address all three.

Spending on food is down and spending on health care is up

Between 2007–2014 in the U.S., middle-class families' **spending on health care increased** nearly 25%, while **spending on food decreased** nearly 8%.



Anna Louie Sussman, "Burden of health-care costs moves to the middle class," *Wall Street Journal*, 25 August 2016; Brookings Institution analysis of Consumer Expenditure Survey, Labor Department.

Packaged food sales coincide with obesity rates

In Latin America, sales of **ultra-processed food and beverage products increased 48%** between 2000 and 2013, compared with 2.3% in North America.



In Latin America, 58% of people are **overweight** and 23% are **obese**.

Ultra-processed food and drink products in Latin America: Trends, impact on obesity, policy implications, Pan American Health Organization / World Health Organization (PAHO/WHO), 2015; *Panorama of food and nutritional security in Latin America and the Caribbean*, Food and Agriculture Organization (FAO) Regional Office for Latin America and the Caribbean, 2017.

Food insecurity drives political instability



When **food prices spiked** in 2007–2008 and 2010–2011, **28 riots** occurred across Asia and Africa, where there are high rates of urbanization and undernourishment.

A Food Secure Future: Warding off instability and conflict, The Chicago Council on Global Affairs, 2017.

EQUITABLE FOODSCAPES

Toward food and social systems that prioritize good food access

TODAY

Recognition that the drastic increases in lifestyle diseases, such as diabetes and heart disease, are more an outcome of a flawed food system than irresponsible individual food choices is growing. The ubiquity of cheap, enticing, unhealthy food is being characterized as a form of structural violence, causing real harm to bodies that are simultaneously obese and undernourished. Today's food environments are engineered in ways that disproportionately harm low-income communities around the world. A diverse group of food activists and eaters is responding to this at different scales by reengineering food environments and shifting from treating food as a commodity to treating food as a fundamental human right.



It's not about the individual. It's not like you're fat, or you're overweight, or you eat unhealthy, because of you, because you made horrible decisions. It's because the world, the society you live in made horrible decisions, deplorable decisions about what was important for you."

—DIABETES EDUCATOR AND ACTIVIST,
23, OAKLAND, CALIFORNIA

SIGNALS



Source: "Chancellor Fariña Announces Free School Lunch for All," NYC Department of Education, 9 June 2017.

WHAT?

All **New York City public school students** will receive free lunch—a departure from standards around the country that impose eligibility requirements on free or reduced-price lunches. The sentiment that “if we want our kids to be well-read, they need to be well-fed” acknowledges that our current food environments have second-order consequences that reduce quality of life.

SO WHAT?

City-level initiatives, which can be implemented more easily than national-level programs, could become an important locus of food justice efforts that recognize good food as a right for all.



Source: youthspeaks.org/thebiggerpicture

The **Bigger Picture Project** uses media engagement to educate people about food-related illnesses (mainly diabetes) and aims to change the public perception of the factors that cause them. They work with young people and educators, using short films, poetry, and writing workshops as tools to encourage the expression and examination of the social lens on lifestyle diseases with the goal of ending type 2 diabetes in young people.

Tomorrow's youth will reject the food advertisements and messages that are making their communities sick, turning to local forms of art and entertainment to educate their peers and create subversive new food narratives.



Source: Zhou Wenting, "Solidarity Fridge helping people in need," China Daily, 13 October 2016.

Shanghai's Solidarity Fridges, based on a model started in Spain, are public refrigerators that provide food for those in need while also reducing food waste. Currently, donations are accepted only from qualified sources due to food safety concerns and can be accessed only by qualified, impoverished households.

Public spaces for free food distribution will reduce the stigma of going to a food pantry and make access to healthy food more convenient. Cheap sensors to monitor food safety will expand the number of donations while reducing risks for eaters.

FUTURE DIRECTIONS

Eaters will hold governments and food companies accountable for food-related illnesses, and food activists will make the connections between deceptive food advertising and packaging, impoverished food environments, and vulnerable low-income populations. This could lead to stricter regulation and more forceful public health campaigns, akin to the shift away from social acceptance of tobacco in the late twentieth century. As we face the consequences of higher health care costs and shorter lifespans, we will look back on the early twenty-first century and wonder how we ever allowed such a harmful food system to exist. Ending structural violence and structural racism will require taking a seat at the table and demanding we treat good food as a human right.



RESTORATIVE FOOD ECONOMIES

Toward business models that put food to work for social justice

TODAY

Former coal-mining regions, with poverty levels well above and education levels well below national averages, are looking for ways to revitalize their economies. Former inmates, who often face unemployment rates of 70 to 80 percent, are seeking opportunities for steady employment. Former soldiers are returning home in search of jobs that match their skillsets. Food is the main ingredient in successful responses to all of these scenarios. As global economic inequality continues to increase, communities are turning to the business of food as an important way to build assets for local resilience. For former inmates, soldiers, and impoverished communities, upskilling in food-related work creates a second chance and a way to enact justice through food.

SIGNALS



Source: lakitchen.org

WHAT?

L.A. Kitchen provides job training for youth aging out of foster care and people coming out of homelessness. It recovers or purchases fresh produce that would otherwise go to waste, and trains unemployed men and women to prepare meals that are then donated to social service agencies serving the elderly in the greater Los Angeles area.

SO WHAT?

As L.A. Kitchen's founder, Robert Egger, says, "Neither food nor people should ever go to waste." Models such as this will move food justice beyond charity and toward empowering the individuals traditionally served by food charities.



Source: rootsofpeace.org

Roots of Peace is a nonprofit organization that uses farming to help vulnerable communities around the world recover from conflict. From Afghanistan to Vietnam, it helps remove landmines to return land to arability, trains local farmers in growing high-value crops, and helps connect the crops to international agricultural markets to provide for vibrant local farming economies.

In post-conflict and post-disaster regions, both land and people need second chances. Efforts to restore land and build farming communities will not only establish local food security but also provide the infrastructure for a sustainable local economy.



Source: Courtney Balestier, "This tiny college town is the epicenter of a food revolution taking place in coal country," *Fast Company*, 12 December 2016.

Berea, Kentucky, is at the center of transitioning Appalachia from a coal- to a food-based economy by creating a friendly operating environment for food entrepreneurs. The city's tourism board runs a food business incubator; the Community Farm Alliance lobbied for home-based processing legislation; and families who want to grow their own food will find education and equipment available through Grow Appalachia.

Regions around the world will reinvent their identities and economies around providing good food and good jobs. Local coalitions of business and government will need to cooperate to create the conditions for these new food economies to thrive.

FUTURE DIRECTIONS

Food can be used as a lever for both economic and social justice. Local agriculture and food enterprises can generate new jobs, keep money in local communities, and result in increased access to healthy food for underserved communities—and maybe, eventually, decreased levels of obesity and diabetes. Learning from the hundreds of successful initiatives already under way, a network of cities will codify and share best practices for using food to improve the lives of some of our most vulnerable populations. As pressure for social justice increases, expect to see the scaling up of efforts as varied as food service job training to reduce recidivism, agricultural drone training programs for veterans, and food-specific business accelerators in economic backwaters.



“ I think that what people don't realize is that if you're farming, if you're connected to food at all, then you are connected politically to what's going on in your country.

—FARMER,
29, GEORGIA, UNITED STATES

DANIEL MARTINEZ

Advocating against food disabilities

Age in 2027: 33

Location: Oakland, California



Daniel Martinez is a community organizer in the East Bay communities of the San Francisco Bay Area. He spends his days fighting for the rights of people with food disabilities—arguing that so-called lifestyle diseases are actually disabilities that result from inequitable access to food. Here’s what he’s up to one afternoon in Oakland.

Daniel’s first stop of the day is the closest grocery store—a half-hour bus ride from his home. He arrives there with his Vouchers for Vegetables coupon book. This is actually a prescription from his diabetes doctor for a program he helped launch to make sure that low-income folks have access to high-quality calories. Before he picks out his weekly allotment of greens and squash, he stops in to talk to the store’s community liaison about repositioning the vegetables more prominently at the front of the store in place of the sugar-laden baked goods that greet customers now. The liaison listens carefully. After all, Daniel is the one who convinced the store to create her position.

His next stop is City Hall, where he has an appointment with two of the planning commissioners who are willing to consider proposed code revisions that will allow farm vendors to set up fresh food carts in some residential neighborhoods. He’s careful to make the argument that food disabilities like diabetes are a social justice issue and ultimately cost the city

in everything from more expensive insurance for city employees to higher costs of compliance with ADA—the Americans with Disabilities Act.

Lunch is a roundtable at the Oakland Hub, a community center for arts and activism. The topic today is prison food. Daniel presents the results of studies that show that prisoners routinely get inadequate nutrition and often ingest excessive amounts of sugar and salt. He argues that prison food is turning the mostly minority population into people with expensive lifelong food disabilities, while the public just chalks up their disease to more lifestyle mistakes.

The afternoon is actually great for his diabetes. He’s getting his exercise by walking door to door, handing out leaflets for Little Free Pantries and explaining to everyone who will listen that if they really want social and political justice, they need to start with food justice—and eliminate the food disabilities that are as systemic as racism in their communities.

INSIGHTS

Eating for Change by Seeking Justice

Drive economic growth with food

Local governments can promote economic growth through food production by supporting entrepreneurship, providing skills training for at-risk community members, and using the city's procurement budget to support local farmers. Pairing good food and good jobs makes a viable business model for food justice.

Fill the distribution gaps

The growth of online grocery shopping creates an opportunity for food retailers to focus their efforts on expanding access to people who currently can't get affordable, healthy food. This can happen in conjunction with bottom-up efforts like the Solidarity Fridges, to ensure access across a city.

Reduce sugar to reduce violence

When the impacts of diabetes and other food-related diseases are seen as a form of violence by some, the ingredients list becomes a place for direct action to reduce harm. If food companies don't act on their own, governments may respond to constituents' demands with regulations and taxation to incentivize responsible food formulations.



Some people are fighting for food waste, others, for organic farming, others for feminism, others for social changes, such as fair trade ... when social movements stand alone we make little progress. If we join together we can make a better Madrid, a better Spain, a better world, right? I think that's an important way to pursue a better future: listening to each other and seeking alliances."

—FOOD WASTE ACTIVIST AND ENTREPRENEUR,
EARLY-30'S, MADRID, SPAIN

Eating for Change by

ALIGNING WITH THE ENVIRONMENT

“ **Of course, it's so important.**

We all eat all the time and we can have such a massive impact on society and the environment if we're just more responsible in how we eat. How could anybody look at themselves in the mirror if they're not thinking about this?

—EATWITH HOST,
27, SAN FRANCISCO, CALIFORNIA

FROM CLIMATE-DISRUPTIVE TO REGENERATIVE AGRICULTURE AND EATING

Our climate is changing. While many eaters understand that their food choices are related to this inconvenient truth, they may still struggle to align their actual consumption with their environmental goals. Belching livestock are responsible for the greatest share of agriculture's greenhouse gas emissions worldwide, a fact that has fueled the Meatless Monday movement, with the goal of reducing meat consumption by 15 percent for both personal and planetary health. Eating organic also helps, as application of synthetic fertilizers is the fastest-growing emissions source in agriculture.

Food companies and entrepreneurs can contribute to environmental resilience by creating regenerative recipes that help eaters align aspirations and actions. In recent years, the environmental interest of eaters has driven the creation of successful new products such as plant-based burgers that “bleed” and beer and bread made with certified regenerative grains. These companies are proving that food can taste delicious and also be good for the environment, and they're attracting eager brand evangelists.

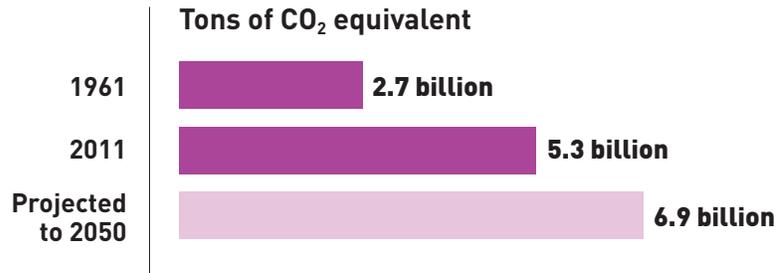
Beyond just reducing harm, people are now looking to food as a lever to restore the environment—for example, by sequestering carbon or creating shoreline buffer zones. In short, rather than just inquiring into a food's “footprint”—the negative impacts and potential risks to the environment—

eaters will want to know about its “handprint”—what it renews and enhances in an ecosystem.

A changing climate threatens where food is grown and where people can live. As more regions are forced to adapt what they grow to new temperatures or rainfall patterns, the stories behind food become inherently linked to stories about climate change. And as climate change creates a massive increase in the number of people displaced by natural disasters and changing weather patterns, climate migrants will form another group of eaters who pioneer practices to align with the environment. Climate migrants are already exploring new entrepreneurial approaches and stories about their traditional foods.

Global emissions from agriculture continue to rise

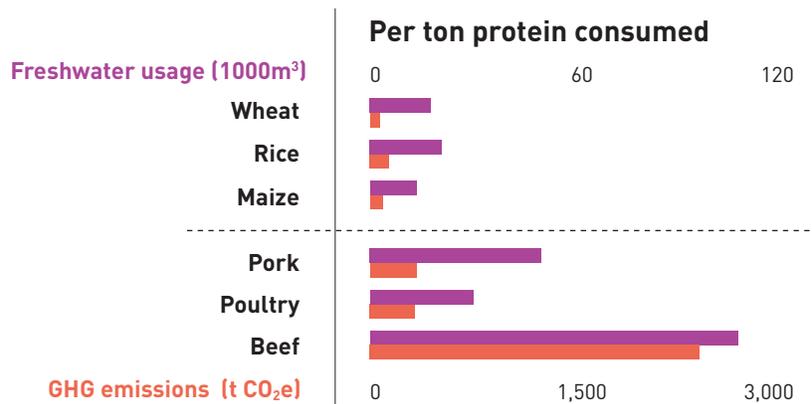
Between 1961–2011, global GHG emissions from agriculture **nearly doubled**, and they could increase by **another 30% by 2050**.



"Agriculture's greenhouse gas emissions on the rise," Food and Agriculture Organization, 11 April 2014.

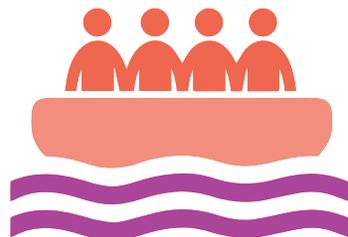
Dietary choices impact the environment

Plant-based protein is less resource intensive than animal-based protein



"Shifting diets for a sustainable food future," World Resources Institute, April 2016.

Displacements linked to extreme weather events are expected to increase



By **2050** there will be up to **200 million** environmental migrants.

"Migration, Climate Change and the Environment," International Organization for Migration, 2017.

EDIBLE ENVIRONMENTALISM

Toward ingredients that perform an ecosystem service

TODAY

Food provides more than just nourishment for our bodies; it can also nourish our earth if produced via regenerative methods. In an age of climate volatility, eaters are beginning to seek out foods as much for their resilience-building capabilities as for their gustatory pleasures. Food production in the future will be planned with environmental aims in mind and thought of as an ecosystem service. Already we are seeing the advent of farming systems that also provide storm-buffering infrastructure, meal delivery companies focusing on soil health, and carbon-neutral restaurants. Eaters and food producers are searching for opportunities to align meals with the values of sustainability, resilience, and regeneration.

SIGNALS



Source: thimbleislandoceanfarm.com

WHAT?

Thimble Island Ocean Farm is a sustainable vertical farm working to restore the ocean and produce healthy food. Through 3D ocean farming, it grows environmentally friendly food products—like kelp and bivalves—while sequestering carbon and building a buffer zone to protect human settlements from natural disasters like massive floods or rising tides. The food production platform also grows biofuels and organic fertilizers.

SO WHAT?

Food production platforms will increasingly be designed to contribute environmental infrastructure that buffers against extreme and volatile climate activity.



Source: blueapron.com

Blue Apron's agroecology team has provided a free soil-testing service to more than 150 farms to analyze soil nutrients and recommend crop families that improve soil health, increase yields, and better fix nitrogen naturally. Blue Apron also builds its menu around the crop rotations that are best for the soil, empowering its farmers to develop a more resilient and sustainable food system.

Those who farm the land won't be seen as the only ones responsible for its health; everyone across the supply chain, including food entrepreneurs and restaurateurs, will become soil stewards.



Source: azurmendi.biz/en

Azurmendi, a restaurant located in the heart of Basque country in northern Spain, takes a culinary approach to addressing climate volatility. Hailed as one of the best and most sustainable restaurants in the world, Azurmendi was built with environmentally friendly materials, recycles all of its waste, harvests rainfall, and uses geothermal energy. Eaters there enjoy food sourced from on-site gardens and from local growers and producers.

In search of climate-positive dining experiences, eaters will seek opportunities to consume foods, and support restaurants, that narrow the gap between producers and consumers.

FUTURE DIRECTIONS

As eaters become more savvy about the ways in which food production can be a service to build environmental resilience, food producers and manufacturers will need to rethink their marketing strategies, supply chains, and business models to align their products with environmental values. Eaters will demand transparency and become more skeptical of greenwashing, making it necessary for companies to move beyond branding to stand behind claims of environmental responsibility. Food producers will need to ensure—and be able to prove—that their products and processes reflect broader environmental values and contribute real services like cleaning and filtering water, protecting biodiversity, maintaining soil stability, or more broadly stabilizing the climate.

“ [A good model for the future will be] taking food—a thing that was previously bought as a commodity and focused only on quantity and pushing the most out of a piece of land—and transforming it into a service.”

—FARMING STARTUP FOUNDER,
34, SHANGHAI, CHINA

CLIMATE CHANGE CUISINE

Toward recipes that evolve for human and planetary resilience

TODAY

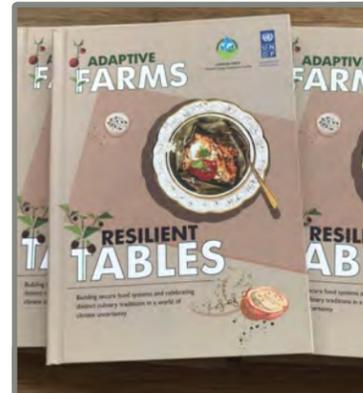
Climate change has created a new type of displaced group—those fleeing the disastrous effects of rising sea levels, unpredictable weather patterns, and drought. Food, and stories about it, has long given immigrants a way to hold on to a taste of home, express identity, and earn a living. Climate migrants will bring a unique new awareness of the relationship between food systems and the environment, and they will remix their farming, cooking, and eating practices in light of this understanding. Those not displaced will undertake efforts to mitigate the threat of displacement, such as adopting climate-resilient agricultural practices, while also embracing their new neighbors' foods for solidarity.



To me, land is a place where you can sustain yourself. You can grow your food.... If you can't even feed yourself as a people, that, to me, is a dire situation. The land allows you to have a place to grow your food, raise your family, and have a place to call your own so you're not dispossessed anymore."

—FARMER, MID-50S, GEORGIA

SIGNALS



Source: undp-adaptation.exposure.co/adaptive-farms-resilient-tables

WHAT?

Adaptive Farms, Resilient Tables, a new cookbook launched by the United Nations Development Program (UNDP), focuses on six regions around the world where climate change has already begun to exert pressure on agriculture. The book showcases recipes that support the resilience required to keep culinary traditions alive in the face of climate change, and it includes the personal stories of how people in those areas have coped with the changes.

SO WHAT?

Institutions will offer tools, often in the form of familiar cultural artifacts, to help preserve food culture and adapt agriculture to new realities as climate change displaces more people and practices.



Source: foodhini.com

Foodhini, a food delivery start-up, is a platform for recent immigrants to capitalize on their culinary skills, share their culture, and earn stable income in their new country. The current popularity of meal delivery services creates an active marketplace for eaters seeking unique new food experiences that also support social causes.

A wave of new business models, payment platforms, and distribution systems at the intersection of food and technology will create new entrepreneurship opportunities for climate migrants and enable eaters to support displaced communities.



Source: "Chinese scientists to develop high-yield sea rice," *Xinhua*, 20 December 2016.
Image Source: Flickr user olly301

Developing a new breed of "sea rice" is the aim of a research team led by Yuan Longpin, a leading rice scientist in China. The team aims to cultivate new strains of high-yield rice that can withstand the increasingly saline water expected to accompany rising sea levels in China's rice-growing river deltas.

As farmers adapt with ingenuity to a changing climate, experiments in climate resilience will become essential to maintain traditional staple crops.

FUTURE DIRECTIONS

As millions flee their homes from Miami and the Maldives, they will strategically blend food traditions with their new environments, adapting practices and pursuing food entrepreneurship as a tool to rebuild their lives. Most of these people will migrate to urban centers within their own countries but will nonetheless feel the cultural impacts of displacement. Food will be an essential medium for creating a sense of home for those who seek to establish themselves in a new place or adjust to a life of constant movement. And even if we are not displaced, we will all face the need to eat for change in the next decade—whether that means shifting diets toward climate-resilient foods or adjusting traditions as familiar foods become less available. Climate change is global, and all eaters will be impacted regardless of where home may be.



ANNA NIELSON

Developing regenerative food economies

Age in 2027: 41

Location: Copenhagen, Denmark



Anna Nielson is Copenhagen's Chief Food Resilience Officer. In this newly created position in the city's Department of Technical and Environmental Administration, Anna is working to jump-start a resilient food economy. Check out the initiatives that are keeping her busy right now.

Anna is getting a lot of positive attention for the keynote she gave at the groundbreaking ceremony for Copenhagen's newest 3D ocean farm off the coast of Saltholm Island. This farm is one of many new entrepreneurial endeavors spun out of Anna's flagship incubator program that pairs food entrepreneurs with city planners and academic research teams. The goal is to launch regenerative food businesses that help Copenhagen meet its 2050 sustainability and resilience goals—to sequester the same amount of carbon it produces, build shoreline resilience that buffers future storm surges, and reduce the greenhouse gas emissions from agriculture by 75 percent.

The Department of Technical and Environmental Administration has also teamed up with the Department of Culture and Leisure to develop a pilot program that provides home gardening kits to every citizen in the four municipalities of Copenhagen. In focus groups with local residents, Anna and her team

learned that Danes deeply value growing food. It provides an anchor in a world of volatility when many are feeling unmoored by political, environmental, and social instability. As one participant said, "Growing food and being able to have a garden creates a sense of permanence that is of real value."

Beyond environmental resilience, Anna is also working on promoting human resilience. Copenhagen just received another wave of climate migrants—people displaced from their homes by extreme weather caused by climate change. In the late 2010s this created a wave of xenophobia, but this time the city is being more strategic about promoting cross-cultural exchange. It just opened a restaurant that features the recipes and stories of these climate migrants. As these newcomers try to recreate their favorite recipes from home, Anna's team helps them source climate-friendly ingredients. The resulting menus weave new stories to teach Danes about the impact of their food choices on the environment.

INSIGHTS

Eating for Change by Aligning with the Environment

Make your recipes regenerative

Look for places in your supply chain where the production of an ingredient could be an opportunity to provide an ecosystem service to the farmland, watershed, or community where it is grown.

Support diasporas of climate change adapters

As more farmers around the world have no choice but to become climate change adapters, they will promote resilience across their networks by openly sharing technologies and techniques. Create or contribute to these networks to help producers adapt to the changes to our planet's climate.

Season your food with stories

Every food carries a story about the environmental values it promotes. Whether you're a fine dining chef, a snack food company, or a home cook, try telling a story about how the food is produced and prepared that reinforces or challenges an eater's understanding of food's environmental impact. Ask yourself what you want future generations to say about this food.



Agriculture wasn't at the table with climate change, and we've changed that globally. Now agriculture is recognized... We'd like farmers to have support for using cover crops, applying more compost—in other words, building up their organic matter—having hedgerows on their farm, having solar panels, reducing their footprint by reducing their packaging. All of these things are possible.”

—ORGANIC FARMER,
60, CAPAY VALLEY, CALIFORNIA.



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