SUSTAINABILITY IS OUR MAIN INGREDIENT

2017 SUSTAINABILITY REPORT
In 2011, I left my job at Stanford University and started Impossible Foods for one reason: to make the global food system sustainable by replacing animal-based foods with delicious, nutritious and affordable meat and dairy foods, made directly from plants.

Livestock and their feedcrops are found on nearly half of the world’s global landmass, degrading our natural ecosystems at the expense of wildlife and biodiversity. The animal agriculture industry is responsible for 25% of all freshwater consumption and 15% of global anthropogenic greenhouse gas emissions— as much as every car, truck, bus, ship, airplane and rocket combined.

Reducing or eliminating animals as a food-production technology is the fastest and easiest route to reducing GHG emissions and global warming. But humans love to eat meat. For billions of us around the world, the meat, fish, and dairy foods that we get from animals are not only an important source of nutrition, but also a major source of pleasure in our daily lives. Despite health warnings, antibiotic resistance and loss of wildlife habitat, consumption of meat from animals has expanded more than four-fold in the past 50 years and is projected to increase by another 60-70% in the next 30 years.

Impossible Foods spent five years studying why people crave meat. Our scientists analyzed meat at the molecular level, then recreated the texture, taste, and aromas of meat using simple ingredients from plant sources, with a tiny fraction of the impact on wildlife habitats, biodiversity, water, and climate. Our first product is Impossible Burger, which we launched in 2016 at four of America’s most respected restaurants. The Impossible Burger quickly sold out and remains among the top selling items wherever it is sold.

Our next challenge is to scale-up to meet demand. In 2017, we inaugurated a factory in Oakland, California that is expected to produce 1.1 million pounds of plant-based meat per month—250 times more than our current production, enough for a million burgers every week.

Even at our rapid growth rate, sustainability remains at the heart of our business. We are integrating sustainability into our day-to-day operations wherever possible, into every aspect of our long-term strategy, and, of course, into our products. We focus on issues representing the world’s most pressing environmental challenges: climate change, land use, water stewardship, wildlife and natural capital.

Thank you for reading this report—Impossible Foods’ first sustainability summary. We welcome your thoughts as we strive to be a global model for sustainability.

Sincerely,

Pat Brown
CEO and Founder
Impossible Foods
Impossible Foods is inventing a completely new, and more sustainable way to produce the meat, fish, and dairy foods the world loves. Our flagship product, Impossible Burger, is available in several award-winning restaurants in the United States. We are hard at work developing a diverse array of products, including pork, chicken, fish and dairy—all made directly and sustainably from plants. We started with Impossible Burger because burgers are beloved and iconic, and, unfortunately, have a disproportionately large environmental impact.

Americans consume about 10 billion pounds of ground beef per year. The average American eats three hamburgers every week—nearly 50 billion burgers per year\(^1\) and about half of this is consumed in restaurants. In order to supply this much meat, around three quarters of all agricultural land in the U.S. is devoted to cattle and the crops they eat. Impossible Burger uses vastly less land, water, and energy than a burger made from cows.
WE SHARE A GLOBAL MISSION TO FIND NEW AND BETTER WAYS TO SUSTAINABLY FEED 10 BILLION PEOPLE BY THE YEAR 2050.
ENVIRONMENTAL MISSION

Relying on animals for food puts tremendous pressure on our natural resources and the ecosystems that keep our planet habitable. According to the United Nations Food and Agriculture Organization (FAO), animal agriculture occupies about 30% of the world’s ice-free land. According to the International Livestock Research Institute, if you include all the land that is grazed by domesticated animals, half of the world’s ice-free land hosts animal agriculture.

Growing plants for livestock accounts for 25% of the world’s fresh water usage. Livestock generate 7.1 gigatonnes of GHGs per year: about the same as the entire global transportation sector and about 15% of all human-induced GHG emissions (that is more than U.S. total GHG emissions per year, ~6.6 gigatonnes of Co2-e in 2015). Cattle raised for beef and milk are responsible for 65% of the livestock sector’s emissions. These emissions come from enteric methane produced by ruminants during their digestive process, from nitrous oxide in manure management, and from the deforestation driven by expansion of pasture and feed crop production.

Our society has embarked on a dangerous path: we are prioritizing livestock, particularly cattle and their feedcrops, and displacing other animals and plants. Over the past fifty years, wild vertebrate abundance has decreased by more than half. Our use of animals to produce food is the major driver of that decline in wildlife populations. As more people around the world move into the middle class, demand for meat is increasing—to the extent that we are razing precious ecosystems and wildlife habitats and turning them into grazing land and cropland for cows. Tropical deforestation is a leading source of new agricultural land; the expansion of our food system, driven largely by livestock production, is coming at the expense of our most valuable (and life-sustaining) habitats. If we continue on this trajectory, we will accelerate biodiversity loss and species extinction.

We cannot preserve these habitats and avoid agricultural intensification by arguing for decreased consumption of meat, or by hoping for regulatory protections of wild spaces. The only durable solution is to deliver uncompromisingly delicious and nutritious meat and dairy products that do not require vast expanses of grazing and feedcrop lands—products that can compete in the marketplace against animal derived products, and win.

Impossible Foods wants to supply people with all the delicious, nutritious and affordable meat they want. We simply make it in a way that is more efficient and scalable than using animals in the food cycle. We want to replace a prehistoric means of food production with one that can sustainably feed 10 billion people by 2050. Bypassing animals and going directly from plants to plate is a more efficient conversion of calories and protein. Replacing animals as a food production technology will not just slow the rate of biodiversity loss; it will create the possibility of actively reversing those losses. We envision a world with more physical space for wild things and natural spaces, with cleaner air and water security—a world in which nature maintains the earth’s balance simply and effectively.
GLOBAL POPULATIONS OF BIRDS, REPTILES, MAMMALS, AMPHIBIANS AND FISH HAVE DECLINED BY 58% BETWEEN 1970 AND 2012.

“Global biodiversity is declining at an alarming rate, putting the survival of other species and our own future at risk. Global populations of fish, birds, mammals, amphibians and reptiles declined by 58 per cent between 1970 and 2012. We could witness a two-thirds decline in the half-century from 1970 to 2020 – unless we act now to reform our food and energy systems and meet global commitments on addressing climate change, protecting biodiversity and supporting sustainable development.”

**LIFE CYCLE ASSESSMENT**

**ENVIRONMENTAL IMPACT AND LIFE CYCLE ASSESSMENT**

Life Cycle Assessment (LCA) is a method for quantifying and comparing environmental impacts of systems and products, based on established methodologies and databases.

As part of our commitment to assess and optimize the environmental impact of our product, we conducted an LCA for Impossible Burger in 2015, with land, water, and emissions as outputs. We then compared the metrics of one Impossible Burger against that of a traditional bovine burger from average U.S. production systems.

Modeled in comparison to reference the values for typical U.S. beef production, one Impossible Burger uses about one quarter of the water, 5% of the land and contributes 13% of the emissions compared to a burger made from cows.

We compare GHG impact against a single standardized bovine benchmark, but there are a range of bovine GHG emission estimates presented in the scientific literature, as shown in Table 1 (pg 10). In terms of real-life impacts, switching from just one cow-based burger to one Impossible Burger spares the emissions of about 18 miles worth of driving, about 25 days worth of drinking water, and about 75 square feet of land.

**INTERPRETING LIFE CYCLE ASSESSMENT RESULTS**

All metrics derived from LCA results are estimates based on a model, and no such model is perfect. We compare our numbers to bovine burgers, yet no two cattle production systems are exactly the same or have the same impacts. Systems are often modeled in different ways, making direct comparisons difficult, so the ranges in this report reflect the range of published values for the livestock industry and the inputs to Impossible Foods’ production process.

We’ve worked to make sure our own small-scale model (based on production of Impossible Burger at our pilot plant in Redwood City, California) is as robust as possible. The model allows us to make comparisons across systems, but also sheds light on our own hotspots—areas that we can target to further reduce our environmental impact.

We still have room for improvement. Our current small scale model has gone through two rounds of reviews via external environmental assessment consultants to provide vetting of our analysis and calculations. Quantis, a leading quantitative environmental consulting firm, conducted the most recent review in 2016. The next step will be to update the model to reflect changes to our sourcing at our new manufacturing facility in Oakland, California, which will begin production in mid-2017. Once we have these new baselines, we can start pursuing the industry gold standard of ISO-compliance through a full LCA audit.

**SWITCHING FROM ONE COW-DERIVED BURGER TO ONE IMPOSSIBLE BURGER SPARES ABOUT 18 MILES WORTH OF DRIVING EMISSIONS.**
WHAT IT TAKES TO MAKE A QUARTER–POUND HAMBURGER
Table 1: In bypassing the cow, Impossible Burger requires a fraction of the resources compared to beef from cattle. Our Impossible Burger uses about one quarter of the water, 5% of the land and contributes 13% of the emissions compared to a burger from cows.

Animal agriculture (aquatic and terrestrial) produces about one third of globally consumed protein, but faces three seemingly insurmountable challenges in the ramp-up toward feeding 10 billion by 2050: finite land available to expand grazing and feed crops; limited potential for intensification; and continued pressures on water resources, climate, habitat and land use. According to the United Nations Food and Agriculture Organization (FAO), meat production has expanded more than fourfold in the past five decades. Over the next 30 years, worldwide demand for meat and dairy is expected to increase by 60-70\%. We have already maximized the use of physical space and resources to supply our current system— scaling an inefficient system any further will drive unacceptable environmental consequence.

Widespread adoption of plant-based meats will make it 100% possible to feed the population, provide nourishment and enjoyment, and help preserve the planet for future generations.

**THE FUTURE OF MEAT**

The Impossible Burger delivers protein and iron comparable to conventional ground beef from cows (80% lean meat, 20% fat), with none of the cholesterol, slaughterhouse contaminants or other toxins that may be found in beef. And because it handles, sizzles, smells, browns and tastes like beef from cows, it has become a favorite of top chefs, and is served in an increasing number of highly acclaimed restaurants across the country.

The burger is just our first product— proof that delicious meats do not have to come from animals. Our platform will enable us to make delicious, nutritious, affordable foods that people love— using technology and ingredients that are vastly more efficient than animals.
Impossible Foods discovered that heme, an essential molecular building block of life, found in all plants and animals, is the magic ingredient that makes meat taste like meat and provides a uniquely bioavailable source of iron.

Heme is exceptionally abundant in the animal tissues we call “meat” and is what gives meat its uniquely craveable taste. While we first harvested heme from the roots of a legume, we now use an engineered yeast to make large quantities of heme by fermentation (a process that is very similar to what has been used for centuries to make Belgian beer).

Thanks to fermentation, we are able to produce heme at a commercial scale, a process that has a much lower environmental impact.

We are proud of our library of knowledge and our advanced Research and Development facilities in our headquarters. Our scientists spent five years developing Impossible Burger, discovering how to use ingredients that are naturally found in plants to create delicious, nutritious, and affordable food with a much lower environmental footprint than conventional meat from animals.

Impossible Burger is already available at several award-winning restaurants and burger establishments, and we are building a state-of-the-art food production facility in Oakland, California, to produce Impossible Burger sustainably at large scale.
OUR IMPACT

Our greatest impact on the planet will be making delicious, affordable, and sustainable products that consumers love—using technology and ingredients that are vastly more efficient than animals. At the same time, we want our daily operations to reflect the sustainability of our product and uphold our ambitious environmental mission.

Improving our internal operations and environmental performance will be an ongoing journey. Some of the areas we are working on include: water, waste, packaging, energy, and responsible sourcing. We have a lot to learn. To measure improvements, a company needs two things: good partners and good data. We have the right partners and have begun collecting the data, with a lot more to come as we learn and improve. With that, we will be able to establish baselines, monitor performance, analyze data and work with our operation leaders to set goals and Key Performance Indicators (KPIs) to measure change.
OVER THE NEXT 30 YEARS, WORLDWIDE DEMAND FOR MEAT AND DAIRY IS EXPECTED TO INCREASE BY 60-70%.
Solid and liquid waste streams are generated across distinct phases within our operations. Manufacturing produces the highest volume, across both pilot-scale food production activities and the commissioning of our new manufacturing facility. The waste consists mainly of food scraps from product formulation and facility commissioning; materials from inbound packaging; and waste water from both our clean-in-place (CIP) process and the fermentation process of heme. We divert final product waste to local agricultural operations from our temporary manufacturing in New Jersey, which we are using as we construct our large-scale site in Oakland, California.

To minimize waste across office operations, we are engaged in comprehensive on-site sorting of recyclables and compostables to avoid landfilling wherever possible. Consumables, such as sampling equipment and containers from our product research labs
We are quantifying both our inbound packaging from ingredient sourcing, and our use of outbound burger packaging. The majority of our inbound packaging is recyclable or reusable. We have arranged for single stream recycling services at our manufacturing facility to divert those items from landfills. We reuse totes and containers wherever and whenever possible.

Impossible Burger is shipped out frozen, in packaging that includes both multi-polymer plastic— to seal and protect the product— and fully recyclable cardboard outer packaging. As we scale, we will continue to develop solutions that promote recovery and recycling, communicate the recyclability of packaging with our customers, and work to optimize packaging design and materials that meet the functional characteristics we need.

We have a long way to go, but at this early stage we have many opportunities to build sustainability into our operations and position ourselves for zero waste goals as we grow.

As we construct our new facility in Oakland, California, we are analyzing how the operation will generate waste and studying options for landfill diversion with the goal of sending steady-state waste to a composting center. The goal for our main production facility is zero-waste.

PACKAGING

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OUR COMMITMENT TO COMBATTING THE GLOBAL THREAT OF CLIMATE CHANGE EXTENDS INTO EVERYTHING WE DO.

OUR GREENHOUSE GAS FOOTPRINT

As part of our commitment to minimizing our climate impact, we track our energy use and our associated greenhouse gas footprint at our current headquarters and will continue tracking this information as we move into our new headquarters, which is four times larger and located a few blocks away in Redwood City, California.

We also plan rigorous tracking of energy use at our new production facility in Oakland, California—but as we ramp up production, we will establish some representative baselines (and opportunities to identify mitigation targets).

We lease our facilities, which presents us with limitations in terms of certain physical upgrades. We have, however, initiated various operational improvements wherever possible and within scope of our leasing agreements.

Thus far, our efforts have been to “reduce before we produce,” while developing action plans for production measures such as solar panel systems. At our headquarters, we have installed passive lighting via skylights to reduce demand on electricity. At our commercial scale facility, we’ve incorporated LED replacements in part of the facility and are working to continue that process.

In order to reduce the environmental impact of our employee meals and snacks, we rely on entirely plant-based foods and caterers who specialize in plant-based dishes.
Impossible Foods is committed to transparency about our ingredients and methods, what they are, why they were chosen and how they align with our commitment to health and sustainability. We routinely welcome a wide variety of visitors into our headquarters, R&D facilities, test kitchen and production plants: including chefs, restaurateurs, distributors, journalists, academics, investors, students, industry groups and many others. We explain through in-person demonstrations and video demonstrations precisely what is in Impossible Burger, how it is made and how we source the ingredients. We list our ingredients, production processes and nutrition panels on our online FAQ. And we welcome questions from the public.

Consumers often ask about our use of genetically engineered organisms. To produce the heme that is essential to making great-tasting meat without using animals, without reliance on soil-disrupting harvest methods for root nodules, we added a plant gene to a strain of yeast similar to the one that has been used for making Belgian beer for nearly 1,000 years. (Genetically modified yeast has also been used for decades to produce rennet used in most cheeses consumed around the world.)

We care deeply about sustainability and the overall impact of our products on the planet and every person who eats them. Our product is currently not certified as organic. As we grow, we hope to demonstrate to suppliers a thriving market for plant-based meat— and we hope to leverage our own size and scale to encourage more suppliers to produce organic ingredients.

Impossible Burger is currently made using wheat protein and is therefore not suitable for people with gluten intolerance. As a small startup backed by individual investors and venture capital firms, Impossible Foods made a strategic decision to launch with a laser focus on a single product— Impossible Burger. As we expand our suite of healthy ingredients and build our supply chain, we plan to develop and commercialize a wide range of products for all consumers, including those with dietary restrictions.
WHAT ABOUT GRASSFED BEEF?

Farmers, chefs and food producers take many different and complementary routes to a sustainable food system—including plant-based cuisine. While we applaud every effort toward the objective of sustainable food, grassfed beef production systems are neither scalable nor sustainable on a global level. In fact, grassfed cows require even more land and water and generate more emissions per unit produced, compared to industrial livestock operations\(^6\). We already devote about half of the continental U.S. to producing livestock products, the vast majority of which is cattle pasture, rangeland, and feed crop acreage\(^8\). Since range-to-plate grassfed beef accounts for only 3 - 6% of total beef consumed in the U.S., it is not possible for that system to expand to meet the demand for beef.

WORKING WITH FARMERS AT THE FOREFRONT OF CHANGE

Food has always been a collaboration between nature and people. Many of Impossible Foods' employees grew up on farms—from dairy farms in Minnesota to small organic farms and ranches in California. We work very closely with farmers, who are among the most important stakeholders in our ecosystem. Every ingredient in Impossible Burger starts in a farmer's field—and as we grow, we unlock new value for farmers' crops. We are at the forefront of a new industry with immense potential for new jobs; new value for farmers, their families, land and crops; and new options for consumers. We work closely with farmers to develop new feedstocks and value chains.

The people producing our food are land stewards, and we share a mutual objective: producing more food more safely and efficiently, in a way that profitably sustains land for future generations. Ultimately, we share a global mission to find new and better ways to sustainably feed 10 billion people by 2050, reduce the negative effects of climate change, and preserve natural capital, biodiversity and agricultural land productivity for future generations.

Laura Zamora, Director of Food Sourcing, was born and raised on a small dairy farm in Minnesota. Laura has a background in agricultural economics and has spent the last 15 years working in food and agriculture. She brings that perspective to Impossible Burger, helping farmers unlock new value for their crops, while working with Impossible Foods to find new and better ways to feed the planet.

SOURCING AND SUPPLY CHAIN

Responsible sourcing and ongoing assessments of our supply chain will be an important step in how we grow and scale our business. Impossible Burger is made from plants, bypassing the need for cows, their pastures and their feedcrops. We have put a lot of thought into other important ingredients, too. The potato protein we use was historically treated as a waste byproduct of potato starch production, but we use it for flavor and texture. For essential fat content, we use coconut oil—a tropical product not linked to major negative externalities such as landscape intensification or deforestation.

We are mindful of coconut demand growth and potential impacts, and have initiated conversations with regional partners to anticipate sustainability related scaling challenges. Heme, another key ingredient in Impossible Burger, is sourced from a yeast fermentation culture, which avoids soil disruption and dramatically reduces land use.

Flexibility is a core tenet of the Impossible Burger's overall product development. Our ability to change our portfolio of ingredients also allows us to incorporate geographic and sustainability related optimization for different regions and different scales.
Every time you choose a 1/4 lb Impossible Burger over a conventional burger made from a cow, you save 75 SQ FT of land for wildlife.
Since our inception, Impossible Foods has gathered a diverse team of scientists, engineers, chefs, farmers, foodies and business partners with an appetite to change the world. To remain at the cutting edge of scientific research and discovery, we need a wide variety of perspectives.

We have approximately 150 employees, spanning a wide range of cultural backgrounds and more than 25 countries. Women make up more than half of our research team, more than half of our senior or principal scientist positions, and nearly half of our executive team. These proportions are notable in the Bay Area, where women typically form a very small minority in corporate leadership.
WHEN FULLY RAMPED UP, OUR OAKLAND FACILITY WILL ENABLE IMPOSSIBLE FOODS TO MAKE AT LEAST 1 MILLION POUNDS OF MEAT PER MONTH.
EMPLOYEE WELLNESS AND BENEFITS

We provide 100% health benefits for all of our employees and their family members, as well as fully paid maternal and paternal parental leave. Our parental leave program exceeds federal requirements and has become a model example for other startups at similar stages of growth. Impossible Foods awards company stock options to all employees, regardless of position or title, reinforcing our philosophy of shared ownership and investment in our people.

To support fitness goals and healthy lifestyles, we offer our employees a fully paid basic health club membership. We also sponsor employee sports teams and running clubs and host major events each year for our staff and their families.

To lighten our employees’ daily commute time and to lower our overall climate footprint, we support employee ride-sharing and are members of the U.S. DOE Workplace Charging Challenge. More than 50% of our employees take public transportation, carpool, or ride their bikes to work on a regular basis. These efforts make a huge difference in the Bay area, as it is one of the worst regions in the United States for traffic congestion.

Impossible Foods also provides a wide variety of plant-based meals and snacks to employees throughout the day—from hot catered lunches at least twice a week, to pantries full of staples such as soups, pasta, cereal, cookies and crackers.

CREATING JOBS AND SUPPORTING OUR COMMUNITIES

The company receives daily deliveries of fresh fruits and vegetables, plus nuts and chips, for munching throughout the day. We encourage our business partners and our colleagues throughout the Bay Area to similarly reduce the impact of their extensive canteen catering operations by reducing or eliminating animal products.

OUR NEW OAKLAND FACILITY

In March 2017, we launched our first large-scale production facility in Oakland, CA. When fully ramped up, the facility will enable Impossible Foods to make at least 1 million pounds of meat per month. The site will increase our production by 250X and modernize a vacant greyfield site formerly occupied by a local bakery company. The increased production capacity will help us scale our business while also bringing job creation and urban revitalization opportunities to the fabric of a hardworking industrial area.

Working with an Oakland based recruiter, we are on track to hire and train 80 additional employees by the time our 67,000 square foot plant is running at full capacity. All candidates, regardless of background, are eligible to apply for competitive positions at higher-than-standard-wages. Our training protocols for Oakland, now in development, will cover a range of manufacturing positions in operations, food safety and sanitation, quality control, packaging, logistics and distribution.
In 2016, the strategy team at Impossible Foods launched an internal Sustainability Task Force. A variety of employees from nearly every major division of the company work together to help implement sustainability improvements wherever possible. For example, the task force has conducted regional field trips, including a visit to our local waste processing and recycling facility, and is developing a “Green Days” program in which company volunteers can use work hours to participate in a variety of environmental and community projects.

Attracting and training great talent is ultimately the most important thing we can do. We recruit from leading local schools and sponsor cross-functional internships and apprenticeship programs that have led to 14 full-time hires specializing in R&D, strategy and engineering.

Facility tours and research projects for local high schools and colleges give local students a glimpse into our vision of a sustainable future. Our promote-from-within philosophy has given more than 40 employees increasing levels of responsibility within the organization.

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A DIVERSE TEAM OF

SCIENTISTS
ENGINEERS
CHEFS
FARMERS
FOODIES

IMPOSSIBLE®
AWARDS & RECOGNITION

2014  BIZSMART AT WORK RECYCLING AND COMPOST AWARD
       Rethink Waste and Recology

2015  EARLY STAGE COMPANY OF THE YEAR
       Global Cleantech 100

2016 - 2017  40 HOTTEST EMERGING COMPANIES IN THE ADVANCED BIO ECONOMY
             Biofuels Digest

2017  BUSINESS ENVIRONMENT AWARD FOR ENVIRONMENTAL INNOVATION
       Acterra Awards

WORLD CHANGING IDEA AWARD FINALIST
       Fast Company

20 BRANDS TO WATCH
       The Challenger Project
REFERENCES


