

Is THIS your

Can we feed the world the nutrients it needs *and* save the planet? Scientists say yes—but only if you change what's on your plate. (Yes, bugs are on the menu!) **BY KIM TRANELL** *Photography by ANTONIS ACHILLEOS*

When Laura D'Asaro opened the oven, the scene resembled a science fiction movie: Grub-like larvae crawled out from her cookies, like the first stages of an all-out waxworm invasion.

Except Laura and her college roommate, Rose Wang, had actually *put* the worms in their dough—just one small experiment in their ongoing mission to make insects appetizing. (What they learned that day: You've got to first freeze the bugs to kill them, so that the **resilient** critters don't survive the baking stage.)

Why on Earth would these friends be messing around with creepy-crawly cookies? "About 80 percent of the world already eats insects," says Laura, now 25, who first sampled a fried caterpillar while studying abroad in the East African nation of Tanzania. "Our big vision is for you to be able to walk into a restaurant someday and order an insect burger, just like you would order one made of chicken or beef."

While they're not quite there yet, Laura and Rose have come a long way since that failed cookie recipe. In fact, the two friends are now the co-founders of Six Foods, a company that makes tortilla chips using ground cricket flour.

But for these young women, it's not just a business. With their cleverly named "Chirps," they have joined an army of food futurists worldwide—nutritionists, scientists, chefs, and inventors who say we're in danger of depleting the natural resources we need to sustain our current diet.

They're all working tirelessly to figure out what new foods are tasty *and* nutritious enough to save humankind.

crickets

future dinner?

mealworms

seaweed

YOUR NUTRITION

CHASING SUSTAINABILITY

6 To fully grasp Laura and Rose's passion for pests, you first have to understand our world's **impending** population problem. According to the United Nations, the number of humans living on our planet is projected to explode in coming years, reaching a whopping 9.7 billion by 2050. Feeding those 2.4 billion extra mouths—the equivalent of an extra China and India!—will require a 70 percent increase in our food supply.

7 "We're all looking for ways to maximize food production while making sure that we deliver adequate protein, vitamins, and minerals," explains nutritionist Marianne Smith Edge of the International Food Information Council Foundation, an organization that tracks food trends and educates consumers.

8 But there's another piece to solving the popula-



I TRIED BUGS!

"I was nervous, but the cheddar-flavored Chirps tasted like Doritos. I would eat them again."

—John Skoblar, a ninth-grader from California

Score: 8

tion-boom puzzle, and that involves achieving something called **sustainability** (see chart on pg. 12): How can we amp up the supply of nutrition-rich foods without destroying our environment?

Right now, producing our protein-packed staples, like poultry and cattle, takes a tremendous amount of water, land, and energy—largely because raising animals also means growing the food they consume. (A telling stat: The grain fed to livestock in the

U.S. could feed nearly 800 million people directly.)

That's exactly why the Chirps founders and their fellow dietary **innovators** are looking lower on the food chain for our future fuel. Crickets, for example, are rich in protein, low in fat, and high in calcium and iron—yet it takes just one gallon of water and two bags of feed to produce a pound of cricket meat (as opposed to 2,000 gallons and 25 bags for a pound

The Way WE EAT

Milestones in the evolution of the "health"

1700s-1800s

Thanks to an abundance of wild game and free-roaming animals, early Americans eat a meat-heavy diet, which they see as essential for a strong and healthy body. (Believe it or not, some people even eat T-bone steaks for breakfast!)

1827

An English chemist named William Prout makes a monumental contribution to nutrition science by sorting foods into "sugars and starches, oily bodies, and albumins"—later known as carbohydrates, fats, and protein.

1860s

Many Americans develop a digestion problem called dyspepsia during the Civil War. So Dr. James Caleb Jackson creates Granula, the first cereal, to pump more whole grains into their meat-centered diets.

1912

Dr. Casimir Funk discovers vitamins, referring to the "vital" substances in foods that could help prevent disease. This eventually causes a major dietary shift toward fruits and vegetables—once thought of as unhealthy because they spoiled so easily!

of beef). "Insects are animals and taste like animals," says D'Asaro. "You can't make a much more realistic meat replacement than that."

BEYOND BUGS

When it comes to finding a sustainable protein source, is D'Asaro right—are bugs really our best replacement for meat? Right now, in a large lab on the outskirts of Los Angeles, dozens of top-notch scientists are tinkering with plant proteins, hoping to prove D'Asaro's statement wrong. These bright minds have been recruited by Beyond Meat, an eco-conscious company that's attempting to realign plant matter into a structure that perfectly mimics animal tissue.

"There's almost no mistaking that meaty texture [of real meat]," the company's founder, Ethan Brown, explains when asked what separates Beyond Meat from the Tofurkys and Gardenburgers of the world. "So we're spending millions of dollars a year on figuring out how to replicate it."

I TRIED SEAWEED!



"I sprinkled Maine Sea Vegetables Triple-Blend Seaweed Flakes on a bowl of chowder and I loved it. They're a healthier alternative to other seasonings and taste really good."

—Jamie Tran, an eighth-grader from New York

Score: 9

Brown's company—which has been backed by big tech-world investors, including the creators of Twitter—isn't the only think-tank focused on making more palatable "meat without feet." In 2013, Dutch scientists grew the world's first "test-tube burger" by starting with a few cow cells in a petri dish, a two-year project that cost \$325,000.

They've since reduced the price per patty to \$11, but the research team admits it will be another 20 years before they can make cultured meat commercially viable—and tackle the taste testers' gripes.

American diet—and how certain staples and habits came to be.

1965

The Immigration and Nationality Act of 1965 is passed, opening our borders to more immigrants from Asia, Africa, and Latin America. These new Americans bring their cuisines with them—forever changing the foods and flavors we enjoy.

1990s



Studies vilifying dietary fats propel America into a low-fat foods frenzy. The problem? All that fat is just replaced with sugar, keeping calorie counts high. (Many scholars believe this contributed to rising obesity rates.)

2015-2016

Recent reports show that our country is back on the right track. Calorie consumption has decreased, soda sales are down, and we're demanding more fresh foods over packaged snacks. Hooray!



2050 & beyond



Our world's population is set to explode. Can we shift to more sustainable foods lower on the food chain to feed the masses and lessen our impact on the environment? Only time will tell!

THE FACTS THAT MATTER:

THE FUTURE OF FOOD

What is SUSTAINABILITY?

The ability to be used without being completely depleted or destroyed.



The PROBLEM:

Our world's growing population.

7.3

BILLION PEOPLE

RIGHT NOW

8.5

BILLION PEOPLE

2025

9.7

BILLION PEOPLE

2050

70%

That's how much food production needs to increase to keep up!



What we eat RIGHT NOW

271 lbs.

The amount of poultry & meat the average American eats per year.



312 million TONS

The amount of poultry & meat produced worldwide in 2014!

Psst... Livestock emit 18% of all greenhouse gases!



What's the COST?



Making just one 1/4 lb. hamburger uses enough water to shower for the next 2.5 months.

What YOU CAN DO Now

Cool idea

Go meatless every Monday!

One small change = a huge impact for you & the planet.

If a family of 4 skips red meat 1 day per week: It's like taking your car off the road for 3 months!

Bonus!

You'll reduce your risk of:

- Heart Disease
- Diabetes
- Cancer
- Obesity



VEGGIES OF THE SEA

Sometime last year—while those Dutch innovators were busy fine-tuning their approach to lab-made meat—Chris Langdon, a marine scientist at Oregon State University (OSU), made an exciting accidental discovery. On a whim, he decided to fry up the unique strain of dulse seaweed he had developed to feed to shellfish, then eat it himself. And guess what? It tasted like...bacon!

Food visionaries rejoiced.

Could this particular salty-sweet strain of algae be a gateway food for our seaweed-suspicious society?

"While not high in protein, seaweeds are packed with vitamins and minerals," explains Michael Morrissey, the director of OSU's Food Innovation Center, where food scientists are scrambling to deliver dulse in products ranging from salad dressings to crackers.

Like Morrissey, sustainability experts strongly believe that algae farming could become the world's largest crop in the future: It grows fast and can be cultivated in the ocean, which is a major plus with land and fresh water in short supply.

Algae also has health values beyond its basic nutrient profile. Scientists are especially excited that seaweed tastes salty yet isn't high in dietary sodium—meaning it could add flavor to foods without raising our risk of high blood pressure and heart disease.

Yup, that's right. In 20 years time, you may be sprinkling seaweed granules—not salt—on your french fries!

YOUR DIET: 2050

Right now, you're probably still sitting at your desk thinking: *No way. I'll never choke down a single six-legged creature or slurp some slimy sea vegetable.* "[Americans] haven't made the leap to eating insects whole, and I don't know



I TRIED FAKE MEAT!

"The Beyond Meat Homestyle Chicken tasted like a chicken nugget... with some other flavor. I wouldn't eat this again."

—Tatum Morris,
a ninth-grader from Minnesota

Score: 5

if we will," says Amy Bentley, a food historian and associate professor of nutrition, food studies, and public health at New York University. "Food taboos are *incredibly* strong."

But then again, many of today's delicacies didn't start out that way. Lobster, now a gourmet dish, was once thought of as the "insect of the sea"—a throwaway food served to servants and prisoners. And how about one of today's go-to healthy meals, the sushi roll? Well, it's a

pretty safe bet that eating raw fish would have made Grandma gag at your age (unless, of course, she hails from Asia, where this particular dish originated).

The truth is, with the right resourceful scientists, creative culinary experts, and visionary businessmen on the job, your generation may be at the forefront of changing the way humans eat forever—whether you like it or not. Because what starts with some inconspicuous cricket-flour tortilla chips or a bacon-flavored seaweed snack can slowly evolve into a widespread belief that eating whole insects with a side of mushy seaweed is no big deal.

"Americans are really genius at making products and marketing them," Bentley explains of the forces that have driven our diet for decades. "If you got Beyoncé to sell algae, I bet it would do pretty well." ■

MEAT without FEET

The first "test-tube burger" was made in a petri dish and cost about \$325,000!

