

Faux Fish Is The Next Big Plant-Based Thing—Here's What's In It

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Learn how alternative seafood is made and why it could be a boon for the environment.

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Credit: Prime Roots

From meatless chicken tenders to plant-based burgers, vegan alternatives to chicken, pork, and beef have become nothing short of ubiquitous.

And now, alternative seafood is poised to join them.

Brands like New Wave Foods—which announced an \$18 million Series A round of funding in January—are working on getting alternative seafood into retailers and restaurants across the US. Others like Prime Roots are opting for a direct-to-consumer model, resulting in a short supply chain and fresher product.

But what exactly is in alternative seafood? And could it be a sustainable solution to the harsh environmental impact of how we currently get our seafood? We spoke to industry experts and nutritionists to find those answers and more.

What's in Faux Fish?

According to a [June 2020 study](#) published in *Nutrients*, researchers found that 63% of seafood consumed in the US happens at home. Most Americans, on average, consume [16 pounds of seafood every year](#)—the most commonly eaten species being shrimp, salmon, canned tuna, catfish, and tilapia.

While buying from [local aquaculture operations](#) and picking invasive or invaluable species such as lionfish and oysters are [sustainable and smart choices](#), they're not the only options. Enter alternative seafood.

Faux fish, or alternative seafood as it's commonly called, can be divided into two distinct types: plant- or fungi-based substitutes primarily made from plant proteins, [vegetables](#), sea plants, or koji, and cell-cultured or lab-grown seafood.

Though not as prolific as their plant-based chicken and meat counterparts, the market for alternative seafood is rapidly growing. Or, as Larissa Zimmeroff explains, alternative seafood is an area in the plant-based market that still has a lot of white space left to explore and develop.

Zimmeroff has been covering developments in the food tech space for close to seven years. Her debut book, [*TECHNICALLY FOOD: Inside Silicon Valley's Mission to Change What We Eat*](#), published earlier this month, is a great reference point for anyone looking to better understand the plant-based meat industry.

According to Zimmeroff, taste and flavoring are the two main reasons why there are fewer alt-seafood options when compared to alt-meats. "Part of the problem is that it's pretty easy to make a burger with textured vegetable protein (TVP), which gives that stringiness, meatiness, tug, and texture of meat," she explains. "But with fish, it needs to be smooth and have a much different bite."

Turning "Fibrous Fungus" Into Lobster Ravioli

The aim of alternative seafood is to provide a product that closely resembles the texture and taste of seafood, minus the environmental and ethical considerations. That's the impetus that led Kimberlie Le to develop a fish-free salmon burger. "What we discovered is that with seafood, no matter which option you pick, there is some compromise that you are going to be making," explains Le.

Her creation not only won [UC Berkeley's Alt. Meat Lab competition](#) but garnered a \$4.5 million investment that led to the formation of [Prime Roots](#), a Berkeley-based, direct-to-consumer brand that makes a variety of plant-based seafood and meats using koji.

An umami-rich mold starter, koji has been used for centuries to ferment miso, soy sauce, and sake. It's also beloved in haute-cuisine establishments for its ability to mimic the naturally distinct taste of meat. Apart from its umami-ness, however, Le explains that koji doesn't have much flavor or taste.

"A whole food source of protein, koji serves as our building block," she says of the fibrous, filamentous fungus that makes up the base of Prime Roots' plant-based products. "By adding flavors and color to koji, we can make a lot of different meats and seafood more convincingly—without having to mask the flavor of soy and pea, which other plant-based companies have to focus on."

"We're excited to be part of the new wave of alt-meat products that are focusing on seafood," says Le. Their plant-based lobster ravioli, which debuted earlier this year, will be followed by other seafood products that are currently in the pipeline.

"Tuna and salmon are some of the most consumed seafood, so targeting what people are already eating and giving them a truly no-compromises, plant-based solution is ideal," she says. "If you're worried about your mercury consumption or you're worried about microplastics, we want you to try this instead."

The Other Alternative: Cell-Cultured Seafood and Shellfish

While plant-based seafood is made entirely from plants or fungi, cell-cultured seafood is composed of actual fish meat that's cultivated in a lab-like setting.

Also known as cultivated or lab-grown seafood, cell-cultured seafood is part of the nascent field of cellular agriculture. "Muscle and fat cells that make up the meat are grown in a controlled environment similar to a fermenter that's used to brew beer," explains Isaac Emery, Ph.D., an environmental scientist and founder of Informed Sustainability Consulting based out of Seattle, Washington. It's an authentic meat steak or filet, minus the process of raising and culling the animal in question.

"Growing crops to feed cells in a bioreactor for cultivated seafood uses much less land than what is currently needed for farm-raised fish and shrimp," notes Emery. Another significant potential environmental impact? Reducing the water pollution that occurs as a result of the use of fertilizer run-off and manure.

Salmon, bluefin tuna, shrimp, lobster, crawfish, and crab are just some of the seafood [varieties] currently being developed by cultivated meat companies such as Wildtype, Finless Foods, and BlueNalu. "There are a lot of companies working on it," says Emery. "But we don't quite know how to make it efficiently or affordably just yet."

Plant-Based Seafood Nutrition Vs. The Real Thing

While fresh shrimp contains 120 milligrams of cholesterol, New Wave's plant-based shrimp is both cholesterol- and trans-fat-free. Thanks to the use of legumes and algae, it's also rich in the omega-3 fats DHA and EPA, which aid brain health and help reduce

inflammation.

"Plant-based seafood, in some ways, may offer nutritionally better products than some seafood," says Susan Greeley, RD, a health-supportive culinary arts chef-instructor at the Institute of Culinary Education. "This depends on what nutritional content is desired—fiber, heart-healthy fats, and whole plant protein are all examples."

So as with all food, you have to read the label. Take, for example, a can of Sophie's Kitchen Black Pepper Toona: made with TVP, it's plant-based, gluten-, soy-, and GMO-free. But one can of "toona" is 240 calories—that's 49 calories higher than regular tuna—and contains less than half the protein of the real stuff.

Another alt-seafood consideration for Greeley is the sodium content. Diets high in salt can increase the risk for developing hypertension, a significant cause of stroke and heart disease. A 100 gram serving of faux tuna has 375 milligrams of sodium. Canned tuna, on the other hand, has 50 milligrams of sodium per 100-gram serving.

"I would consider a can of 'toona' to be a high sodium food," she says, adding that plant-based does not always equate to healthier—especially if a food is highly processed. "If you're looking for a low-sodium option, canned tuna fish, in this case, is a much better choice."

The Future of Alternative Seafood

A \$1.4 billion industry, the US market for plant-based meats is growing three times as fast as its animal-based counterpart. According to GFI, a non-profit dedicated to alternative protein research, this translated to a 45% increase in growth in 2020 alone, signaling a change in habits as consumers opt for more sustainable food options that benefit not just their personal health, but the environment and all involved workers as well.

When it comes to environmental impact, Emery explains that one of the biggest consequences that alternative seafood will have has less to do with replacing the seafood that we eat now and more to do with preventing new fish farms and shrimp farms from coming into being.

"When we think about the current damage to mangrove forests from shrimp farms and ocean ecosystems from commercial fishing operations, that's bad," explains Emery. "But cutting down what's left? That's even worse."

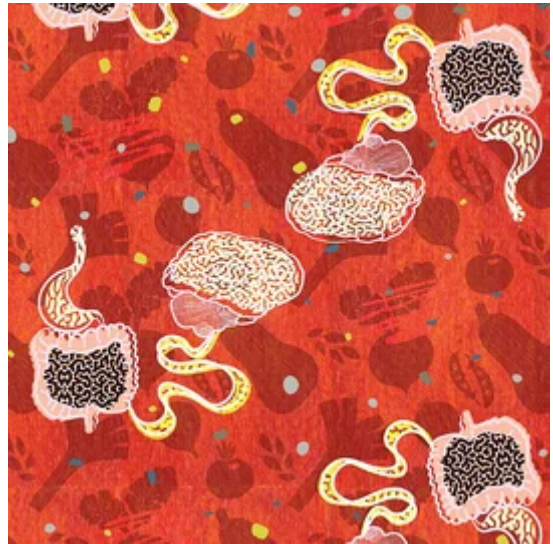
As the effects of climate change worsen, Emery says we have to shift to a preventative mindset. "Preventing more damage and protecting the ecosystems that we still have left is more important than reversing the damage that's been done," he says. "The more we can do to preserve what's left, the better off we'll all be."

For Greeley, developing plant-based and cell-cultured seafood is not necessarily about replacing seafood, but creating sustainable alternatives that help expand our global food supply chain and provide consumers with adequate plant-based protein choices.

Le agrees: "One of the biggest things to getting more people to try plant-based seafood is having more plant-based options available," she explains. "The majority of people in [the Prime Roots] community identify as flexitarian. Our products are not just for vegans or vegetarians—they are for everyone."

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