

State of the Industry Report

Alternative seafood

January 2020 - June 2021



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The Good Food Institute (GFI) is a 501(c)3 nonprofit think tank and open-access resource hub developing the roadmap for a sustainable, secure, and just protein supply. We identify the most effective solutions, mobilize resources and talent, and empower partners across the food system to make alternative proteins accessible, affordable, and delicious.

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Section 1: Introduction

The alternative protein industry witnessed record-breaking growth in 2020, and alternative seafood is poised to become an increasingly important segment of the industry. In 2020, the U.S. retail plant-based food market grew 27 percent, almost twice the rate of the total retail food market (which grew faster than normal as a result of Covid shifting sales to the retail channel), to just over \$7 billion. U.S. plant-based meat retail sales grew 45 percent, flying past the \$1 billion mark for the first time and closing out the year at \$1.4 billion in total sales.

There is arguably no category more urgent and ripe for innovation than seafood. Alternative seafood retail sales in the U.S. grew by 23 percent, from \$10 million in 2019 to \$12 million in 2020. While this early growth is promising, alternative seafood remains a market whitespace, and is a fraction of the size of the alternative protein market, which is, in turn, a small slice of the overall meat and seafood market.

GFI is pleased to offer our first state of the industry report focusing on the global alternative seafood industry. This report covers the industry's commercial landscape, investment, and consumer insights from January 2020 to June 2021 and sales data from January 2020 to December 2020.

Section 2: Commercial landscape

The alternative seafood industry has grown significantly in recent years. In 2017, approximately 29 companies worldwide were making seafood from plants, from microbes through fermentation, and from animal cells. By the end of June 2021, that number had jumped to more than 87 companies.

This section includes lists of companies producing seafood in each of the three categories. While these lists are comprehensive, they are not exhaustive. If your company produces alternative seafood and is not on this list, please add it to GFI's [company database](#).

Companies producing plant-based seafood

Company	Headquarters	Product(s)
24 Vegan	Arcadia, California, USA	Fish sauce
Asante	Mexico City, Mexico	Ceviche
Atlantic Natural Foods	Nashville, North Carolina, USA	Shelf- stable tuna
Beleaf	City of Industry, California, USA	Shrimp, ribbon fish
Betterfish*	Berlin, Germany	Shelf- stable tuna
Birds Eye Green Cuisine	Feltham, UK	Fish sticks
Bonsan Absolutely Vegan	Kingston Upon Thames, UK	Whitefish fillets, shelf- stable tuna
Brew51*	Bangalore, India	Salmon fillets
Cavi-art	Herning, Denmark	Caviar
Chin Hsin Foods	Taiwan, China	Salmon, whitefish
Divina Teresa*	Mos, Spain	Squid, whitefish fillets, fish burgers
Finless Foods	Emeryville, California, USA	Raw tuna
Fisch vom Feld	Bremerhaven, Germany	Whitefish fillets, fish sticks
Fry's	Durban, South Africa	Shrimp, whitefish fillets
Gardein	Richmond, British Columbia, CA	Crab cakes, whitefish fillets
Good Catch	Newtown, Pennsylvania, USA	Fish sticks, whitefish fillets, crab cakes, fish burgers, shelf- stable tuna
Goshen Alimentos	Ibiúna, Brazil	Shrimp
Happy Ocean	Munich, Germany	Shrimp
Hooked Foods	Stockholm, Sweden	Shelf- stable tuna
Hungry Planet*	St. Louis, Missouri, USA	Crab cakes
IMA*	London, UK	Salmon
Impact Foods*	Berkeley, California, USA	Raw tuna
Incrivel Seara	São Paulo, Brazil	Cod, fish sticks

Jia Jia Wang Trading	Singapore	Salmon, prawns, abalone
Jinka	Burlingame, California, USA	Tuna spread
Karuna	Nagoya, Japan	Shrimp, oyster, shelf- stable tuna, whitefish fillets, swordfish
Kuleana*	San Francisco, California, USA	Raw tuna
Liang Yi Food Industries	Singapore	Anchovies, balacan (shrimp paste)
Lord of Tofu	Loerrach, Germany	Shrimp, shelf- stable tuna, whitefish fillets, shark
May Wah	New York, New York, USA	Shrimp, lobster, squid, abalone, salmon, scallops, shelf-stable tuna, crab, golden fish fillets
Mimic Seafood	Madrid, Spain	Raw tuna
Modern Meat	Vancouver, British Columbia, CA	Crab cakes
Moving Mountains	London, UK	Fish sticks, whitefish fillets
Naka	Karnataka, India	Undisclosed
Nestlé	Vevey, Switzerland	Shelf- stable tuna
New Wave Foods*	Stamford, Connecticut, USA	Shrimp
Novish	Breda, NL	Fish sticks, fish nuggets, fish burgers
Ocean Hugger Foods	New York, New York, USA	Raw tuna, raw eel
OmniFoods	Hong Kong SAR, China	Whitefish fillets, shelf- stable tuna, fish burger
OsomeFood	Singapore	Fishcakes, fishballs
Planted Foods*	San Francisco, California, USA	Shelf- stable tuna
Planteneers	Ahrensburg, Germany	Shelf- stable tuna, raw tuna, raw salmon, fish sticks
Plantish*	Revhovot, Israel	Whitefish fillets
Prime Roots	Berkeley, California, USA	Lobster ravioli, lobster mac and cheese
Revo Foods	Vienna, Austria	Salmon strips, salmon spread
San- Iku	Chiba, Japan	Shelf- stable tuna
Save Da Sea*	Victoria, British Columbia, CA	Smoked salmon
Schouten	Noord-Brabant, NL	Shelf- stable tuna, fish burger, fish sticks
Seasogood	's-Hertogenbosch, NL	Shelf- stable tuna
SeaSpire	Mumbai, India	Undisclosed
SoFine Foods	Landgraaf, NL	Fish fingers, fish nuggets, fish burgers
Sol Cuisine	Mississauga, Ontario, CA	Whitefish fillets
Something Better	Oakland, California, USA	Fish sticks
Sophie's Kitchen	Sebastopol, California, USA	Shrimp, whitefish fillets, smoked salmon, shelf-stable tuna
The Plant Based Seafood Co.*	Grimstead, Virginia, USA	Crab cakes, scallops, shrimp
The New Butchers	São Paulo, Brazil	Cod fillets and dumplings, salmon
Tofuna Fysh	Portland, Oregon, USA	Fish sauce
Umiami	Paris, France	Cod

VBites*	Corby, UK	Salmon, fish steaks, salmon strips, scampi, fish fingers, tuna pâté
Vegafit	Overijssel, NL	Fish sticks
Vegan Zeastar	Friesland, NL	Raw tuna, raw salmon, shrimp, calamari, cod
Veganz*	Berlin, Germany	Fish sticks, salmon
Vegefarm	Taiwan, China	Mackerel, shrimp, tuna salad, fish steak
Veggie Champ*	New Delhi, India	Fish sticks, shrimp, whole fish
Veggie Gourmet	Kemnath, Germany	Whitefish fillets
Wiesenhof	Visbek, Germany	Fish sticks, fish nuggets
Worthington	Ooltewah, Tennessee, USA	Tuna
Wu Chung	Taiwan, China	Abalone, tuna

*Indicates companies that are woman-owned/run

Company spotlight: Good Catch

In 2020, Gathered Foods—the makers of Good Catch plant-based seafood products such as tuna pouches, crab cakes, fish fillets, and fish sticks—entered into a joint venture partnership with legacy seafood company Bumble Bee Foods. The partnership enabled Gathered Foods to invest more heavily in its U.S. infrastructure. That same year, the company entered the European market and opened a new manufacturing facility in Heath, Ohio—a 42,500 sq. ft. facility enabling Gathered Foods to diversify its products and grow its manufacturing volume. This new U.S.-based factory is expected to eventually manufacture products worth \$100 million in revenue.

In 2021, Gathered Foods secured \$26.35 million in Series B funding. The company increased its presence in foodservice and is now available in Veggie Grill, Bareburger, and Whole Foods Delis.



Images courtesy of Good Catch

“Gathered Foods has a serious sense of urgency. In each funding round we search for value-added, strategic investors to bring the company to its next definitive milestone. In the case of our Series B, this was a focus on global supply chain and distribution, each of which will be paramount to the next phase in the company’s growth.”

—Chris Kerr, Executive Chair of Good Catch

Company spotlight: The Plant Based Seafood Co.

Virginia based seafood company, the Van Cleve Seafood Co., which previously sold plant-based seafood products under their Wild.Skinny.Clean line, launched The Plant Based Seafood Co. Their Mind Blown Coconut Shrimp was named the Most Disruptive Product of 2020 in the Prepared Foods' Spirit of Innovation awards. They also sell dusted scallops, dusted shrimp and lobster crab cakes.

In 2021, the female-owned company partnered with wholesale distributor, Pod Foods, as part of the company's retail launch in the U.S. Products are also sold directly to consumers on the company's website.



Images courtesy of The Plant Based Seafood Co.

“We believe that true and meaningful change comes from within, and is why we sought to be the first seafood company to offer a plant based alternative. Our history in the seafood industry gives us a unique inside view into the negative effects that unethical practices, climate change, and overfishing are having on our oceans. By creating plant based seafood, we are able to offer a seafood experience that consumers crave and can trust is not contributing to the problem.”

—Monica Van Cleve-Talbert, Co-Founder and CEO of The Plant Based Seafood Co.

Company spotlight: OmniFoods

In 2021, Green Monday's foodtech business, OmniFoods, expanded into plant-based seafood. Previously known for their plant-based pork mince, OmniPork, the Hong-Kong based company expanded its offerings to include six seafood products: two different fish fillets, an ocean burger, salmon, shelf-stable tuna, and crab cakes. The products, which are high in protein and omega-3 fatty acids, will first roll out in select Hong Kong restaurants before landing in retail later in 2021.



Images courtesy of Green Monday Group

“We cannot tackle climate change without addressing the destruction of our oceans. Overfishing and bottom trawling devastate our marine ecosystems. While conventional seafood accounts for 17 percent of animal-based protein sales in the U.S., plant-based seafood only accounts for less than 1 percent of the entire plant-based protein market in the U.S. This is why, since the launch of OmniPork in 2018, Green Monday has started focusing on seafood. The OmniSeafood series promises to not only wow taste buds, but also to awaken our consciousness toward our oceans.”

—David Yeung, Founder and CEO of Green Monday Group

Companies producing cultivated seafood

Company	Headquarters	Product(s)
Another Fish	Montréal, Québec, CA	Whitefish
Avant Meats*	Hong Kong SAR, China	Fish maw, sea cucumber, whitefish
Cell Ag Tech	Ontario, CA	Whitefish

Bluefin Foods*	Los Angeles, California, USA	Bluefin tuna
BlueNalu	San Diego, California, USA	Tuna, mahi mahi, red snapper
Bluu Biosciences	Berlin, Germany	Salmon, trout, carp
Cultured Decadence	Madison, Wisconsin, USA	Lobster
Finless Foods	San Francisco, California, USA	Bluefin tuna
Magic Caviar	Amsterdam, NL	Caviar
Sea-Stematic*	Johannesburg, South Africa	Undisclosed
Shiok Meats*	Singapore	Crustaceans
SoundEats	Seattle, Washington, USA	Undisclosed
Umami Meats	Singapore	Undisclosed
Wildtype	San Francisco, California, USA	Salmon

*Indicates companies that are woman-owned/run

Company spotlight: Avant Meats

Even at the midyear mark, 2021 has already been a significant year for the female-owned and Hong Kong-based Avant Meats. The company, which develops cultivated fish maw, sea cucumber, and whitefish, announced several noteworthy developments in the first half of the year:

- In March 2021, Avant Meats announced that it achieved a 90 percent reduction in cost in the production of its fetal bovine serum (FBS)-free cell culture media. They also announced a partnership with Chinese biopharmaceutical company, QuaCell, to bring the cost down an additional 75 percent.
- In April 2021, the company announced that they are establishing a new R&D and pilot manufacturing facility in Singapore. This plan received support from the Singapore Economic Development Board.
- In June 2021, Avant Meats was selected to join the World Economic Forum's 2021 cohort of Technology Pioneers. Along with 100 other early- to growth-stage companies around the world, Avant Meats will take part in a two-year program during which they'll have a platform to bring their unique insight and expertise to critical global discussions.

Company spotlight: Wildtype

In June 2021, cultivated salmon company, Wildtype, opened a pilot facility that will serve as part plant, part tasting room, and part educational center. The California-based company plans to launch first in foodservice and eventually in retail.



Image courtesy of Wildtype

“Our pilot plant was designed with multiple objectives in mind. First, it's a place where visitors can sample our products and learn about how they were made. It will also be a functioning food facility producing seafood for sale. Finally, it will allow us to continue to rapidly refine our production process as we continue to innovate.”

—Justin Kolbeck, CEO and co-founder of Wildtype

Companies producing seafood using fermentation

Company	Headquarters	Product(s)
Algama	Paris, France	Shelf- stable tuna
AquaCultured Foods*	Chicago, Illinois, USA	Whole-muscle cut
New Singularity	Hong Kong SAR, China	Shrimp, tuna, eel
Triton Algae Innovations	San Diego, California, USA	Tuna
Odontella*	Bordeaux, France	Salmon slices
Quorn	Stokesley, England, UK	Fish sticks

*Indicates companies that are woman-owned/run

2020 fermentation highlights

Fermentation in the alternative protein industry refers to cultivating microbial organisms for the purpose of processing a foodstuff or food ingredient; obtaining more of the organism itself as a primary source of protein; or deriving specialized ingredients, such as flavorings, enzymes, proteins, and fats, for incorporation into plant-based products or cultivated meat.

At the time of this report, Quorn's fishless fingers are the only widely available fermentation-enabled seafood product on the market. Below are several fermentation-enabled seafood product highlights from 2020 and early 2021:

- Aqua Cultured Foods is **developing the first whole muscle seafood alternative** created through microbial fermentation.
- Odontella, which makes a structured salmon analogue using seaweed and microalgae, **announced two contracts with food retailers** for at least 500,000 servings.
- ENOUGH **announced a prototype mycoprotein tuna steak** produced via a 3D printer made by Natural Machines.

Want to learn more about fermentation? GFI's **State of the Industry report for fermentation-enabled meat, eggs, and dairy** covers the commercial landscape, innovation opportunities, product and ingredient applications, investment trends, regulatory status, and more. Also read up on **the science of fermentation**.

Section 3: Notable partnerships and launches

Branded manufacturers and the incumbent meat and seafood industries are beginning to seize opportunities in the emerging alternative seafood market. In addition to generating new revenue streams, alternative seafood products offer a more stable and predictable supply of inputs, minimizing both risks and costs for large and small producers. Sustainability is also a significant driver, with companies recognizing increased consumer interest in more ocean-friendly seafood options. Players of all sizes are diving into alternative seafood in new and notable ways:

Large food companies and conventional seafood companies

- Seara Alimentos, a subsidiary of the Brazilian meat company JBS, **launched a line of plant-based products** including fish sticks and cod.
- Nestlé **launched its first plant-based seafood product**, Vuna. The plant-based tuna, which is sold under Nestlé's Garden of Eatin' brand in Switzerland, comes in a glass jar and on pre-made sandwiches. The company has **stated** that they are already developing additional plant-based seafood products.
- Thai Union **launched a range of plant-based products** and **plans to introduce a plant-based shrimp product** by the end of 2021.
- Virginia-based Van Cleve Seafood Company **launched The Plant Based Seafood Co.** which offers a range of plant-based seafood products.
- Cargill **introduced a plant-based scallop** co-branded with Lawson, a Japan-based convenience store chain.
- Birds Eye's plant-based brand, Green Cuisine, **added fish fingers** to its plant-based meat repertoire.

Partnerships

- Shiok Meats and Integriculture **announced a collaboration** to scale up production of Shiok's cultivated shrimp meat. Integriculture is adapting its food-grade culture medium, as well as its scalable cell culture protocols (CulNet System), for shrimp cell culture.
- Animal feed provider Nutreco **announced partnerships** with both Mosa Meat and BlueNalu.
- BlueNalu signed MOUs with **Pulmuone, Thai Union, and Mitsubishi**. The latter two partnerships will assess market development strategies for BlueNalu's products in Asia.
- The Plant Based Seafood Co. **announced a retail launch and partnership** with Pod Foods. Pod Foods is a female-owned, tech-forward distribution and logistics company that specializes in emerging brands.
- Ocean Hugger Foods **announced a relaunch** by the end of 2021 in partnership with Thailand-based Nove Foods. Its plant-based seafood products will be available in both retail and foodservice, with a focus first on the U.S. and Europe.

- New Wave Foods **entered a non-exclusive agreement** with the largest foodservice redistributor in the U.S., Dot Foods, to officially launch its plant-based shrimp in North American restaurants.
- Gathered Foods and Bumble Bee Foods **entered into a joint venture** to expand the reach of Good Catch plant-based seafood products in retail.
- Avant Meats **formed a strategic partnership** with Vinh Hoan Corporation (VHC), the world's largest conventional pangasius company. The partnership will support Avant Meats' development and commercialization while diversifying VHC's product portfolio to appeal to a growing consumer base. Avant Meats also **partnered** with Chinese biopharmaceutical company, QuaCell, to help bring the cost of their FBS-free cell culture media down an additional 75 percent.
- Dutch plant-based seafood company Novish **launched their plant-based seafood products** in the German fast food seafood chain Nordsee. Its plant-based products are now available in all 370 Nordsee locations in Germany, Austria, Cyprus, and the Czech Republic.

Section 4: Investments

This section provides a global overview of recent investment activity for alternative seafood companies. Investment activity has seen continuous growth over the last four years as investors increasingly identify the significant opportunity alternative seafood presents.

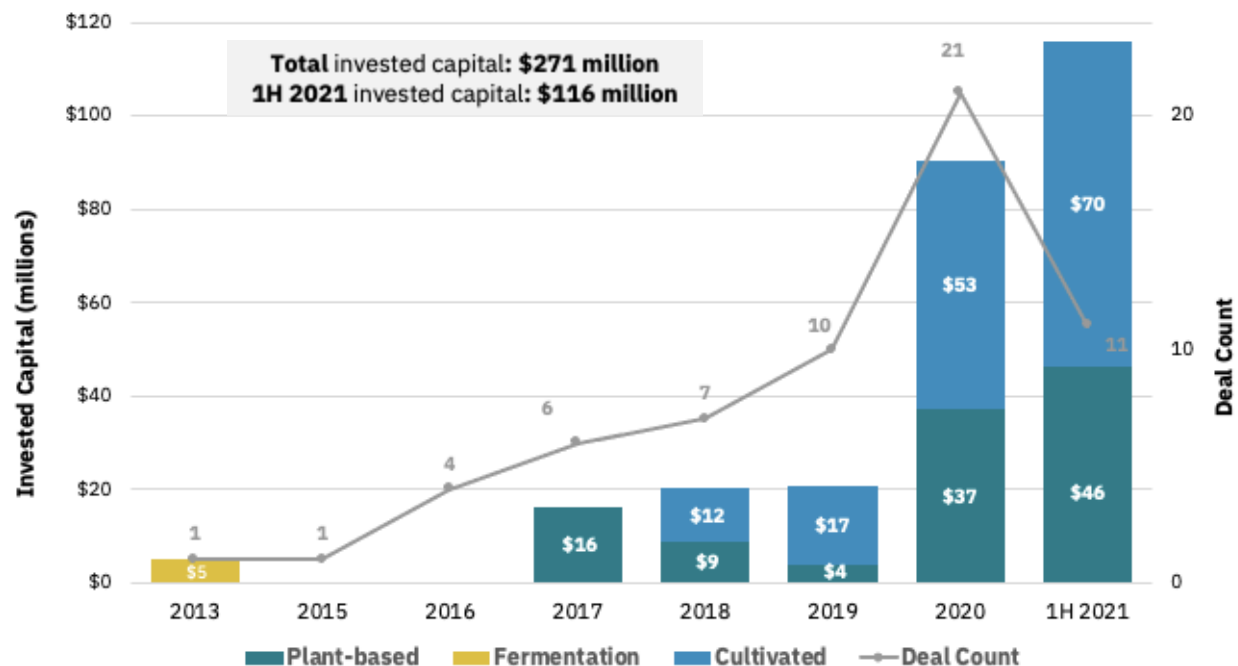
Data collection methodology

GFI conducted a global analysis of alternative seafood companies using data from PitchBook. Our analysis uses a list we custom built in PitchBook of companies that focus solely on alternative seafood. PitchBook profiled 37 alternative seafood companies, of which 24 have disclosed deals. Of the 61 deals closed from 2013 through mid-2021, 40 have publicly disclosed amounts. Because these aggregate calculations account only for companies with deals and deal sizes disclosed to PitchBook, they are conservative estimates.

For the purposes of this report, *invested capital/investment* refers to accelerator and incubator funding, angel funding, seed funding, equity and product crowdfunding, early-stage venture capital, late-stage venture capital, private equity growth/expansion, capitalization, corporate venture, joint venture, convertible debt, and general debt completed deals. Please note that the figures published in this report may differ from prior figures published by GFI as we continually improve our dataset.

Investment activity

Annual investment in alternative seafood companies: 2013 – 1H 2021



Source: GFI analysis of PitchBook Data, Inc. Invested capital includes accelerator and incubator funding, angel funding, seed funding, equity and product crowdfunding, early-stage venture capital, late-stage venture capital, private equity growth/expansion, capitalization, corporate venture, joint venture, convertible debt, and general debt completed deals.

Note: Data has not been reviewed by PitchBook analysts.

The first half of 2021 saw record investments, already exceeding total investment in 2020. Through June, 2021, there has been \$116 million of invested capital (excluding liquidity events) across seven deals with disclosed deal sizes. In total, there have been eleven disclosed deals; the sizes of four deals were not disclosed.

Most active investors in alternative seafood by deal count (2020-1H 2021)

Investor	Investor type	Headquarters	Deal count (2020-1H 2021)	Investments (2020-1H 2021) PB: plant-based C: cultivated F: fermentation
Big Idea Ventures	Venture Capital	New York, NY, USA	4	Gathered Foods (PB) Hooked (PB) New Wave Foods (PB) AquaCultured Foods (F)
CPT Capital	Venture Capital	London, United Kingdom	4	Avant Meats (C) BlueNalu (C) Bluu Biosciences (C) Gathered Foods (PB)

Siddhi Capital	Venture Capital	Cherry Hill, NJ, USA	4	BlueNalu, 2 (C) Gathered Foods, 2 (PB)
Agronomics (LON: ANIC)	Venture Capital	Douglas, United Kingdom	3	BlueNalu, 2 (C) Shiok Meats (C)
AiiM Partners	Impact Investing	Palo Alto, CA, USA	3	BlueNalu, 2 (C) Shiok Meats (C)
Clear Current Capital	Venture Capital	Hutchinson Island, FL, USA	3	BlueNalu (C) Gathered Foods, 2 (PB)
Unovis Asset Management	Venture Capital	New York, NY, USA	3	BlueNalu (C) Gathered Foods, 2 (PB)
208 Seed Ventures	Angel Group	Columbia, MO, USA	2	Avant Meats, 2 (C)
E2JDJ	Venture Capital	New Orleans, LA, USA	2	Gathered Foods, 2 (PB)
Enfini Ventures	Venture Capital		2	BlueNalu (C) Gathered Foods (PB)
Gaingels	Venture Capital	New York, NY, USA	2	Finless Foods (C&PB) New Wave Foods (PB)
Good Startup	Venture Capital	Singapore	2	Avant Meats (C) Cultured Decadence (C)
Lever VC China	Venture Capital	China	2	Avant Meats (C) New Singularity (F)
ProVeg Incubator	Accelerator/Incubator		2	Hooked, 2 (PB)
Social Starts	Venture Capital	San Francisco, CA, USA	2	Cultured Decadence (C) Finless Foods (C&PB)
SOSV	Venture Capital	Princeton, NJ, USA	2	Finless Foods (C&PB) New Wave Foods (PB)
Stray Dog Capital	Venture Capital	Leawood, KS, USA	2	BlueNalu (C) Gathered Foods (PB)
Veg Capital	Venture Capital	Loughborough, United Kingdom	2	Gathered Foods (PB) Hooked (PB)
VegInvest	Venture Capital	New York, NY, USA	2	Shiok Meats, 2 (C)

Source: GFI analysis of PitchBook data.

Notes: Data has not been reviewed by PitchBook analysts. "Most active investors in alternative seafood by deal count (2020-1H 2021)" includes any organization that made two or more publicly disclosed investments in an alternative seafood company from January 1, 2020 to June 30, 2021.



2020 and 1H 2021 investments in plant-based seafood companies with disclosed deal sizes

Company	Headquarters	Total disclosed funding (\$M)	Deal type	Year founded
AquaCultured Foods	Chicago, Illinois, USA	\$0.13	Accelerator/Incubator	2020
Gathered Foods	Newtown, Pennsylvania, USA	\$63.15	Series B, Early Stage VC, Series B2	2016
Happy Ocean	Munich, Bayern, Germany	\$0.14	Accelerator/Incubator	2020
Hooked Foods	Stockholm, Sweden	\$0.79	Early Stage VC, Seed, Accelerator/Incubator	2019
Kuleana	Berlin, Germany	\$0.17	Accelerator/Incubator	2019
New Wave Foods	Stamford, Connecticut, USA	\$18.0	Series A	2015
Revo Foods	Vienna, Austria	\$1.79	Accelerator/Incubator, Seed	2020
The Plant Based Seafood Co.	Grimstead, Virginia, USA	\$0.08	Accelerator/Incubator	2020

2020 and 1H 2021 investments in cultivated seafood companies with disclosed deal sizes

Company	Location	Total disclosed funding (\$M)	Deal type	Year founded
Avant Meats	Hong Kong SAR, China	\$3.10	Seed	2018
BlueNalu	San Diego, California, USA	\$80.05	Series A, Accelerator/Incubator, Early Stage VC	2017
Bluu Biosciences	Berlin, Germany	\$8.38	Seed	2020
Cultured Decadence	Madison, Wisconsin, USA	\$1.70	Accelerator/Incubator, Seed	2020
Finless Foods	San Francisco, California, USA	\$10.23	Series A	2016
Shiok Meats	Singapore	\$15.60	Early Stage VC, Series A	2018
Wildtype	San Francisco, California, USA	\$4.00	General Debt	2017

Publicly available investment vehicle

The vast majority of cultivated meat companies are private, making it difficult for the lay investor to access the segment. **Agronomics Limited (LSE: ANIC)** offers a solution: a **listed** vehicle on the Alternative Investment Market of the London Stock Exchange. The listing provides a wider range of investors access to this rapidly growing segment. Agronomics' cultivated meat **portfolio** includes BlueNalu, CellX, Meatable, Mosa Meat, New Age Meats, Shiok Meats, and SuperMeat.

2020 and 1H 2021 investments in fermentation-derived companies

While there were no investments in fermentation-derived companies in 2020 with disclosed deal sizes, fermentation seafood company New Singularity raised an undisclosed amount in a Seed round led by Lever VC China.

In 2021, AquaCultured Foods raised \$1,300 in Accelerator/Incubator funding from Big Idea Ventures and raised an undisclosed amount of Early Stage VC funding in a round led by Sustainable Food Ventures.

Investment spotlight: S2G Ventures

In 2020, S2G Ventures announced a new ocean and seafood strategy and investment team. The group has committed to \$100 million in “early, venture, and growth stage companies globally across thematic areas including seafood and alternative protein sources, aquaculture and supply chain innovation, traceability/transparency, algae/seaweed, and ecosystem services.” S2G, which includes Beyond Meat and Ripple Foods in its portfolio, is a multi-stage investment firm focused on human health, climate change, and planetary health.

Investment spotlight: BlueNalu

BlueNalu took second place among all cultivated meat companies for the largest fundraising round in the first half of 2021 when it raised \$60 million of convertible debt. This followed behind Eat Just's \$170 million raise through its new cultivated-meat-focused subsidiary, Good Meat. This raise enabled BlueNalu to launch the world's first commercial pilot facility for cultivated seafood. The 40,000-square-foot facility will support BlueNalu in its plans for market launch by the end of 2021.

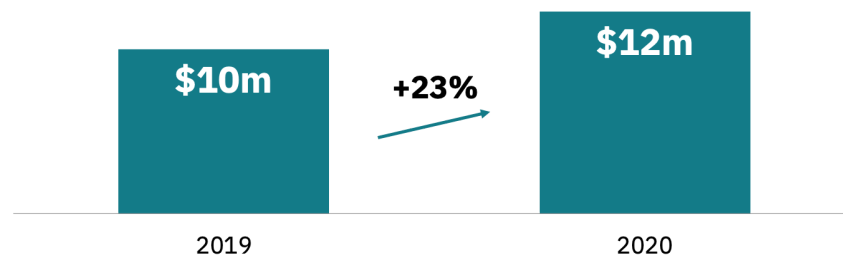
For more investment information on the entire alternative protein market, visit [GFI's investment page](#).

Section 5: Sales

U.S. plant-based seafood retail sales

Across the United States, plant-based seafood retail sales increased by 23 percent in 2020. Despite the two million dollar growth, plant-based seafood still remains a small fraction of the overall plant-based meat and seafood category, accounting for less than one percent of dollar sales.

U.S. retail sales of plant-based seafood reached \$12 million in 2020



Source: SPINS Natural Enhanced Channel, SPINS Conventional Multi Outlet Channel (powered by IRI) | 52 Weeks Ending 12-27-2020

Note: The data is based on custom-GFI plant-based categories that were created by refining standard SPINS categories. Due to the custom nature of these categories, the presented data will not align with standard SPINS categories

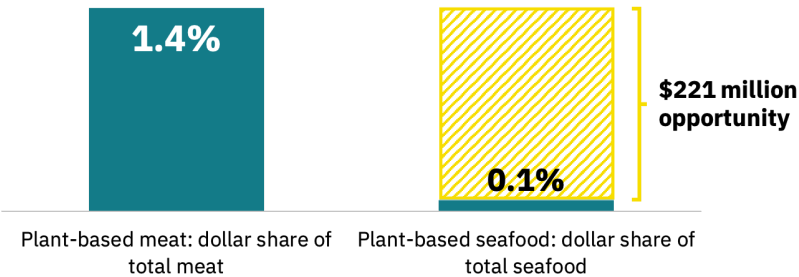
Plant-based seafood is well poised to capitalize on the momentum of the broader plant-based industry. The graph below compares the current retail dollar share of both plant-based meat and plant-based seafood, as a percent of total meat and seafood. In 2020, plant-based meat made up 1.4 percent of the retail dollar share amount of all meat products in the U.S., while plant-based seafood made up a mere 0.1 percent of the retail dollar share amount of all seafood products in the U.S (\$15 billion¹).

Retail plant-based seafood sales could grow by \$221 million if the category was able to capture the same share of the seafood market that plant-based meat has of the meat market. Because a large percentage (65%)² of seafood sales in the U.S. occur in foodservice, this opportunity is an underestimate of the total market opportunity, which is likely much greater.

¹ Nielsen, xAOC+Whole Foods, 52 weeks ending 12-31-2019

² Love, David C., et al. "Food Sources and Expenditures for Seafood in the United States." *Nutrients*, vol. 12, no. 6, 17 June 2020, p. 1810, 10.3390/nu12061810. Accessed 18 Sept. 2020.

\$221 million opportunity if plant-based seafood reaches 1.4 percent dollar share of the U.S. seafood market

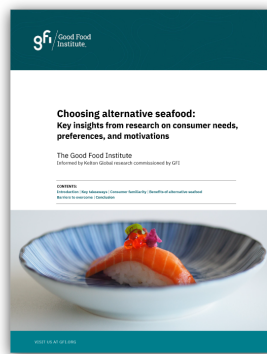


Source: SPINS Natural Enhanced Channel, SPINS Conventional Multi Outlet Channel (powered by IRI) | 52 Weeks Ending 12-27-2020

Note: SPINS does not report non-UPC animal-based meat counter sales. The plant-based meat share of the total meat category assumes that non-UPC animal-based meat counter sales are equivalent to animal-based packaged meat sales.

Section 6: U.S. consumer research

To date, little research has been conducted on consumer attitudes towards alternative seafood. To fill this gap, GFI partnered with consumer insights and brand strategy firm, Kelton Global, to determine U.S. consumer needs, preferences, and motivations as they relate to choosing alternative seafood. The resultant study, *Choosing alternative seafood: Key insights from research on consumer needs, preferences, and motivations*, surveyed 2,500 U.S. residents ages 18 to 65, with the sample reflecting nationwide population demographics. The results illustrate which consumers are interested in alternative seafood and why, offering key insights for industry players to better appeal to potential consumers and propel the entire industry forward.



[Read the full report.](#)

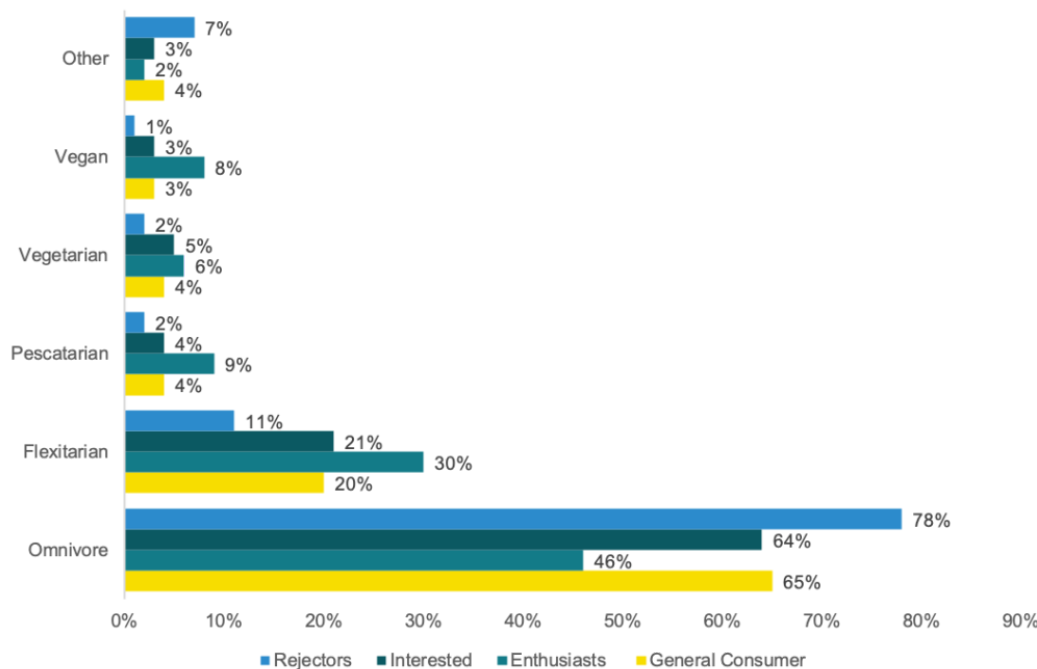
Major takeaways from the report

1. Alternative seafood is well-positioned to appeal to general consumers.

Participants in this study were grouped into three categories—alternative seafood enthusiasts, alternative seafood interested, and alternative seafood rejectors—based on how appealing they found plant-based or cultivated seafood and how likely they were to purchase either. Notably, a greater proportion of alternative seafood enthusiasts are flexitarian and pescatarian than the general consumer. Alternative seafood is therefore already appealing to groups beyond vegans and vegetarians.

2. Alternative seafood enthusiasts are more likely to identify as flexitarian or pescatarian.

Consumer interest by diet category



Base: n=2538, omnivores were 65% of sample
What is your dietary preference?

3. Taste and texture are table stakes.

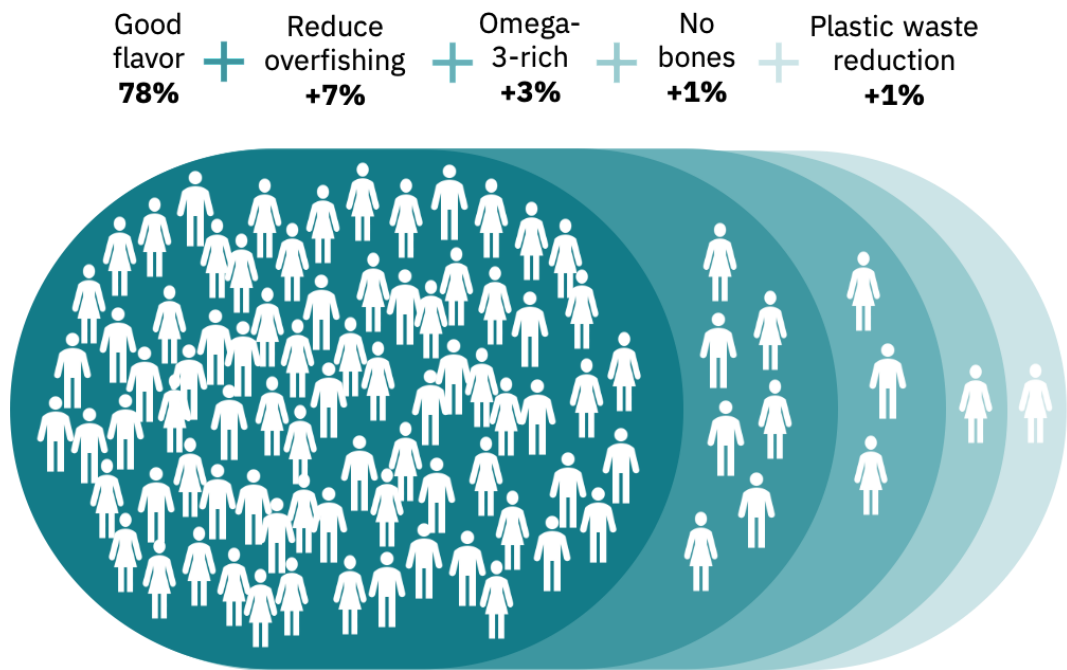
Consumers repeatedly cited taste and texture as the most important factors in determining whether or not they would eat alternative seafood products. When asked which functional factors were most important in choosing alternative seafood over conventional seafood, the majority of consumers cited flavor as most important, followed by food safety, tasting like conventional seafood, and texture. When asked why they might not choose alternative seafood, most consumers also cited anticipated taste and texture as barriers to choosing alternative seafood.

4. Environmental, health, and functional benefits messaging draws in additional consumers.

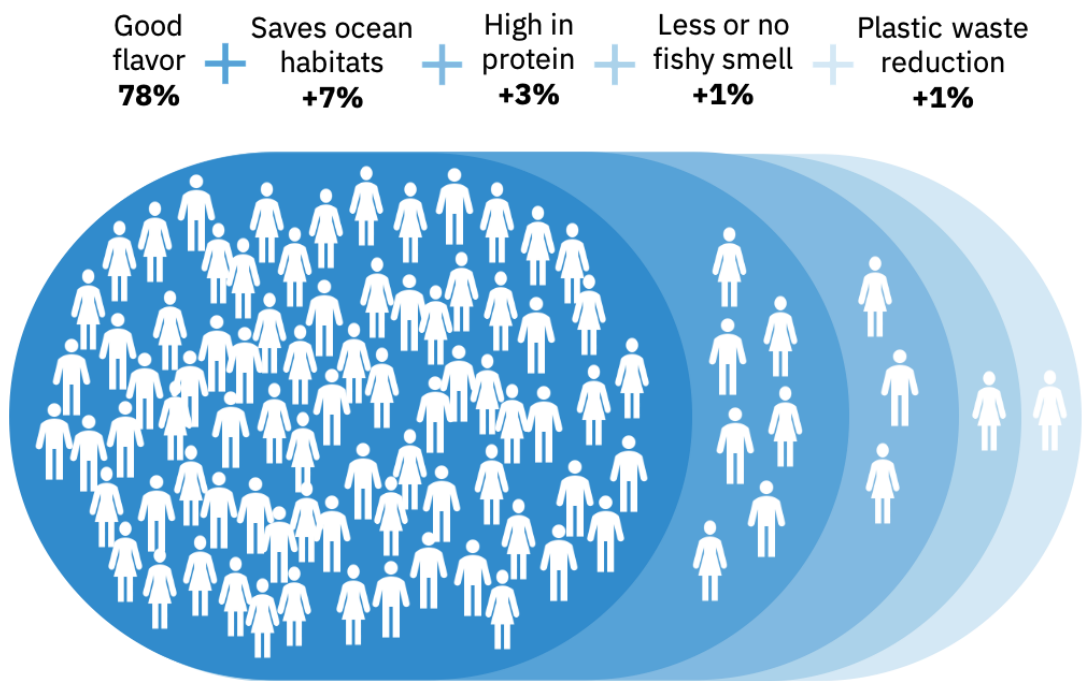
Proper messaging about alternative seafood benefits is crucial to consumer trial and adoption. 78 percent of consumers would try plant-based and cultivated seafood based on flavor messaging alone. Once consumers have a positive impression of alternative seafood flavor, messaging focused on these products' environmental, health, and functional benefits are likely

to bring additional consumers into the category. For cultivated seafood, messaging about these products’ ocean habitat benefits, protein content, lack of “fishy” smell, and reduction in plastic waste produced by ocean fishing can generate additional gains. For plant-based seafood, messaging about reduction in overfishing and plastic waste from fishing, high omega-3 content, and lack of fish bones can generate additional gains.

Plant-based seafood messaging attributes TURF (total reach)



Cultivated seafood messaging attributes TURF (total reach)



4. Consumers showed interest in both plant-based and cultivated seafood.

Consumers consistently ranked plant-based and cultivated seafood motivations and barriers in the same order of importance. This was true for environmental, health, and functionality benefits—with only a few negligible differences in the functionality category. After learning about plant-based and cultivated seafood, 42 percent of consumers found plant-based seafood appealing and 43 percent would consider purchasing it in the future. 35 percent of respondents found cultivated seafood appealing and 38 percent would consider purchasing it in the future.

Section 7: Conclusion and opportunities

With the growth of the alternative protein market and increasing consumer concern about the health of our oceans, alternative seafood is starting to see more attention from incumbent meat and seafood companies as well as existing alternative protein companies. Diversifying supply chains beyond wild-caught and farmed seafood better positions companies to weather supply and demand swings and shocks, which mitigates risk and increases operational stability. Incorporating alternative seafood into company business models has the potential to broaden consumer reach by creating products suitable to a range of diets and priorities, while appealing to younger generations who are increasingly looking for more sustainable and ethical protein options. Expanding alternative protein portfolios also helps companies meet increasingly critical corporate sustainability goals.

Opportunities

This report highlights the alternative seafood industry's impressive growth in the context of its still relatively small market size. With a small but growing industry comes significant opportunities for new product development and innovation. For more information about alternative seafood-specific whitespaces, check out GFI's [Advancing Solutions for Alternative Proteins \(ASAP\) database](#).

Three opportunities are highlighted below:

- 1. Species variety:** Because far more species of aquatic animals are consumed compared to species of land animals, there are nearly endless opportunities to develop novel products. Seafood preferences vary widely by region, providing unique opportunities for new products to be developed to meet niche market needs.
- 2. Texture parity:** Most plant-based products on the market are breaded or minced. With more sophisticated plant-based manufacturing methods, and with the advent of cultivated seafood, it is possible to create the layers of fat, collagen, and protein that give fish its desirable textural and cooking properties such as flakiness.
- 3. Refrigerated products:** There is little plant-based seafood in the refrigerated seafood section or at the seafood counter, where consumers are shopping for conventional seafood. Moving beyond frozen and shelf-stable products and getting out of the frozen veggie section will increase the visibility of plant-based seafood and accelerate the growth of the category by bringing in new consumers in the same way that placing plant-based milk and plant-based meat in the dairy and meat aisles have.

Additional resources

GFI's **Sustainable Seafood Initiative** is a hub for all things alternative seafood. Below are a few other seafood-focused resources:

- The **Ocean of Opportunity** whitepaper provides an overview of the alternative seafood sector.
- Read the **full report** on GFI-commissioned U.S. alternative seafood consumer research.
- Sign up for the **Turning the Tide** quarterly newsletter for relevant industry news, research updates, and events in alternative seafood.
- Visit GFI's **PISCES/ATLAS tool** for qualitative and quantitative information to inform alternative seafood species selection. This tool centralizes research on specific marine species, including nutritional profile, market size, greenhouse gas footprint, and animal welfare metrics to accelerate the development and commercialization of alternative seafood products.

Acknowledgments

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About GFI

The Good Food Institute is a 501(c)3 nonprofit organization developing the roadmap for a sustainable, secure, and just protein supply. We identify the most effective solutions, mobilize resources and talent, and empower partners across the food system to make alternative proteins accessible, affordable, and delicious.

Our Sustainable Seafood Initiative

The welfare of billions of people and the stability of life on earth depend on a healthy ocean. Overfishing has driven numerous species to extinction and ecosystems to the point of collapse. Shifting to plant-based, cultivated, and fermentation-derived seafood is the most tractable way to improve our ocean's health.

 Visit gfi.org/seafood to learn more.