

# Opportunities in Alternative Seafood

June 25, 2020



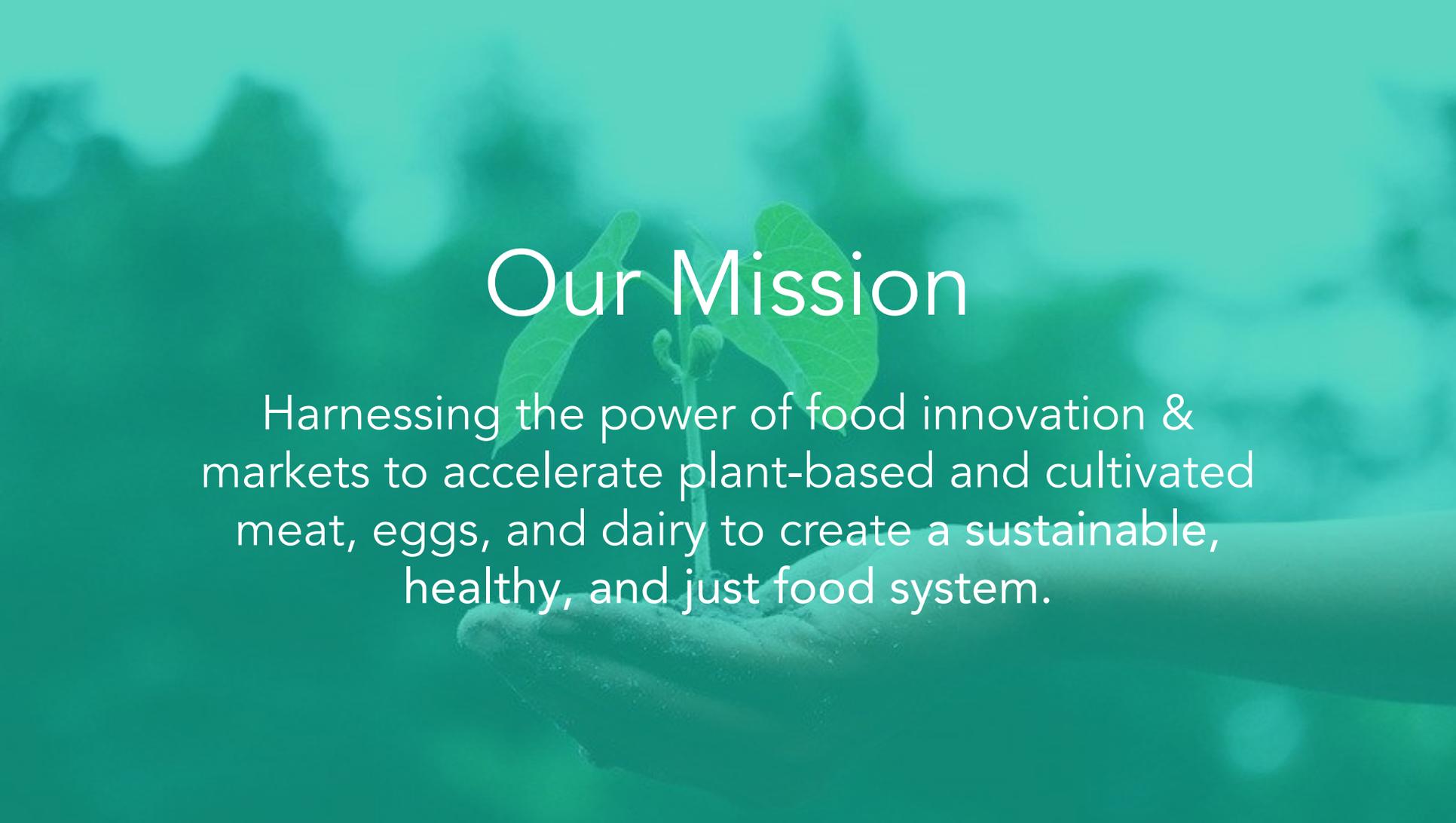
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# Overview

1. **Why alternative seafood and the current market** - The Good Food Institute
  - Introduction to GFI
  - Projected global seafood demand
  - Advantages of plant-based and cultivated seafood
  - The current state of the alternative seafood market
2. **Future consumer trends** - Changing Tastes
  - How will we eat seafood in the U.S. in the next 3-5 years?
  - Data from consumers, menus, and foodservice purchasing decision-makers

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# Introduction to GFI and alternative proteins

A hand is shown from the bottom right, cupping a small green seedling with two leaves and a tiny bud. The background is a soft-focus teal color with a bokeh effect of light spots. The text is overlaid on this background.

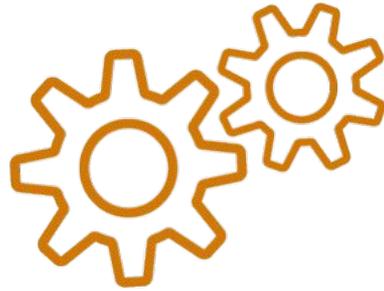
# Our Mission

Harnessing the power of food innovation & markets to accelerate plant-based and cultivated meat, eggs, and dairy to create a sustainable, healthy, and just food system.

# How will we feed 10 billion people by 2050?



Sustainably



Efficiently



Safely

# Three categories of alternative seafood

PLANT-BASED  
PROTEINS

*Sophie's*  
KITCHEN



FERMENTATION

Quorn™



CULTIVATED MEAT

WILD  
TYPE



# The Good Food Institute

Accelerating the shift to a sustainable, healthy, and just food system through three key areas of work:



## Science and Technology

Advancing and open-sourcing the foundational science of plant-based and cultivated meat



## Corporate Engagement

Consulting with the world's biggest food companies to help them capitalize on opportunities in the plant-based market and supporting startups to drive innovation



## Policy

Advocating for fair regulation of plant-based and clean meat and lobbying for governmental investment in sustainable protein R&D



GFI officially earned GuideStar's 2020 Platinum Seal of Transparency - obtained by less than 1% of nonprofits - reflecting our commitment to maximum impact, efficiency, and inclusion.

We act as a force multiplier, bringing the expertise of our departments to the rest of the world.



UNITED STATES  
BRAZIL  
INDIA

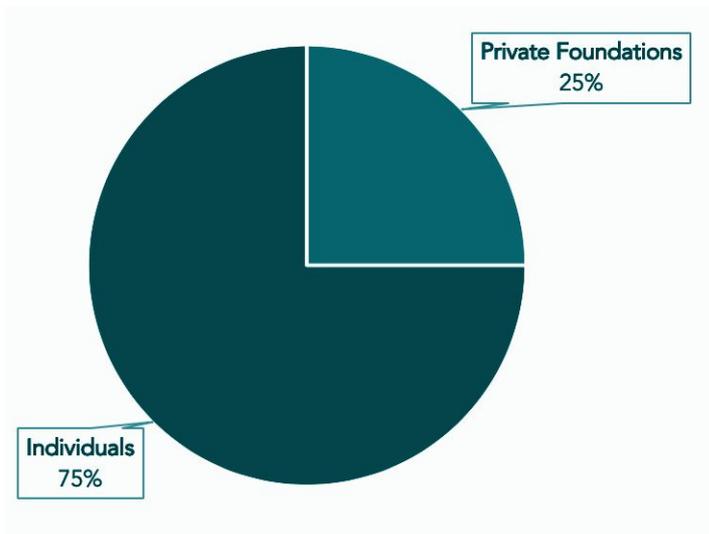
ISRAEL  
EUROPE  
ASIA PACIFIC

**90+ staff in 6 countries**

# How GFI is funded

GFI is 100% powered by philanthropy.

Our 2,800+ donors include:



We accept corporate support:

Event sponsorship:



- Kellogg's MorningStar Farms
- Beyond Meat
- EY

Supporting GFI's Research Grant Program:



Funds critical alternative protein open access research and connects researchers to private sector partners.

# Keep up with the news from GFI



Sustainable Seafood Initiative newsletter  
(launching this summer)

<https://go.gfi.org/seafood-newsletter>



Plant-Based Insider

<https://www.gfi.org/insider>



GFI e-news

<https://www.gfi.org/e-newsletter>

## What do you want to read in the Plant-Based Insider?

Tell us what content will be most valuable to you. Please take our [2-minute survey](#).

[Take the survey](#)

It continues to be an exciting time to be working in the plant-based industry. **Beyond Meat** went public this month ending the first day of trading up 163%, iconic restaurant chains **Burger King** and **Del Taco** added plant-based meat to their menus, and **Chick-Fil-A** is investigating plant-based options. Not to diminish that amazing progress, but we also face an increasing number of state-level label censorship bills—some similar to the one passed in Missouri last year. Please read on for more information.

## Policy Update

### Label Censorship bills

Last year, Missouri became the first state in the country to adopt a law



## Plant-Based Insider

The latest news & opportunities for the plant-based industry

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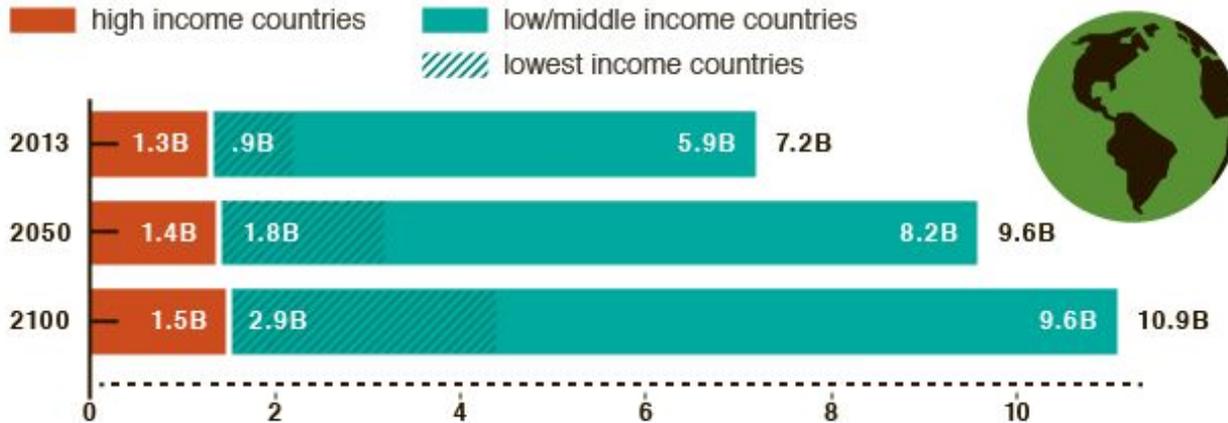
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**Global seafood demand is on the rise.**

# Projected population growth

High population growth is projected in low- and middle-income countries.



Source: UN-DESA, 2013

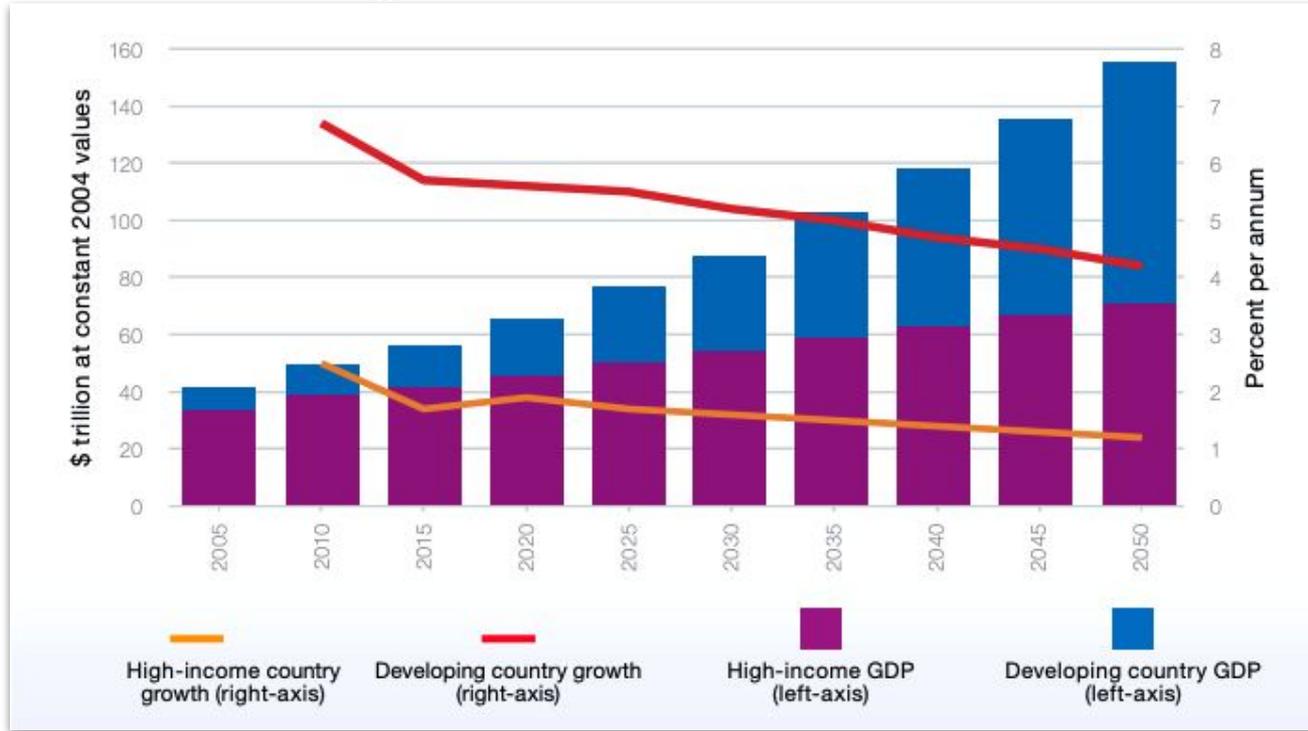
**Big Facts**  
[ccaafs.cgiar.org/bigfacts](http://ccaafs.cgiar.org/bigfacts)



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



# Projected income growth

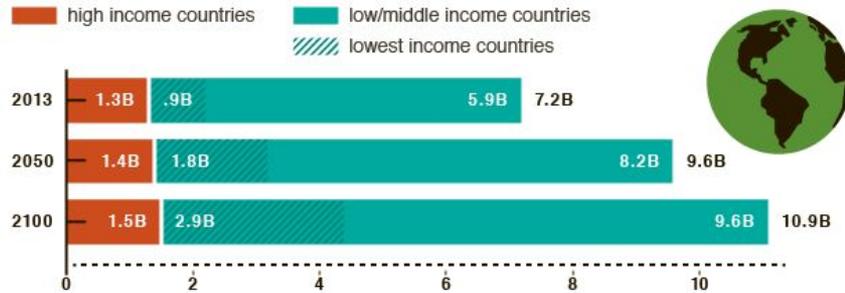


Source: Simulation results with World Bank model, 2009

# Growing global demand for seafood

Global demand for seafood is projected to be 30% higher than 2010 levels by 2030.

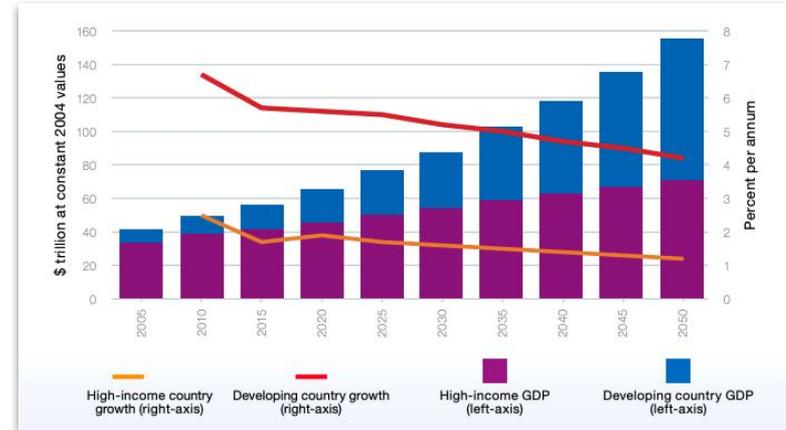
High population growth is projected in low- and middle-income countries.



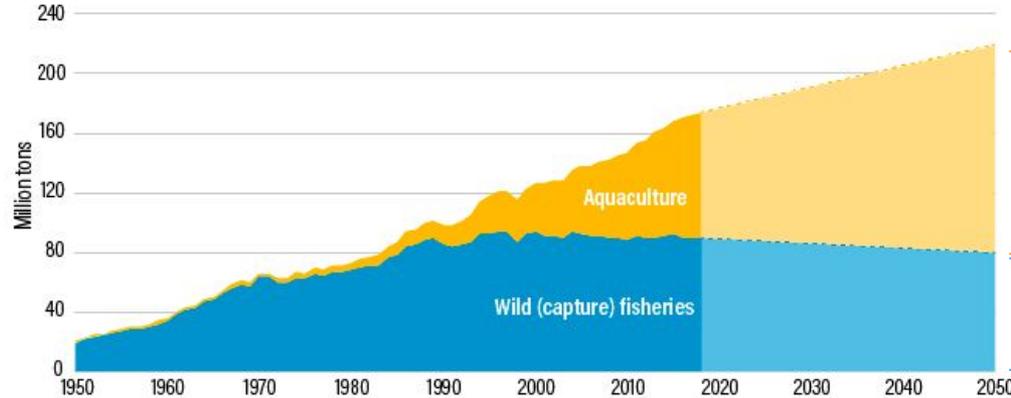
Source: UN-DESA, 2013

**Big Facts**

[ccafs.cgiar.org/bigfacts](http://ccafs.cgiar.org/bigfacts)



# Projected seafood demand



## How will we meet increasing demand?

Aquaculture growth is only anticipated to keep pace with increased demand for 17 countries, while around 170 countries will be left with substantial unmet demand (2017 FAO study).

Marginal increases in wild-caught seafood

Sources: Historical data, 1950–2016: FAO (2017b) and FAO (2018).

Projections to 2050: Calculated at WRI; assumes 10 percent reduction in wild fish catch from 2010 levels by 2050, linear growth of aquaculture production of 2 Mt per year between 2010 and 2050.

 WORLD RESOURCES INSTITUTE

## FISH TO 2030

### Prospects for Fisheries and Aquaculture



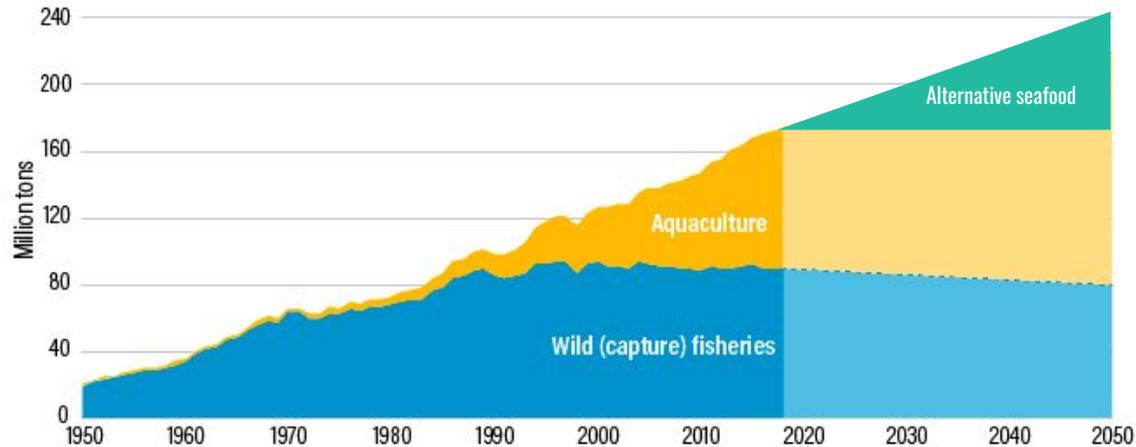
THE WORLD BANK



## AES

Agriculture and  
Environmental Services

# Another supply source: alternative seafood



Sources: Historical data, 1950–2016: FAO (2017b) and FAO (2018).  
Projections to 2050: Calculated at WRI; assumes 10 percent reduction in wild fish catch from 2010 levels by 2050, linear growth of aquaculture production of 2 Mt per year between 2010 and 2050.



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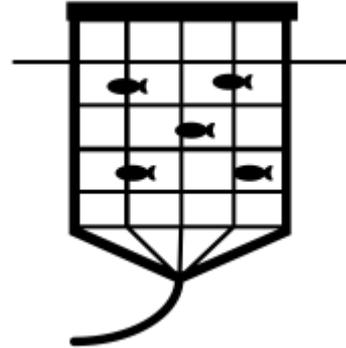
# Advantages of alternative seafood production

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Demand for seafood is largely met through two production systems



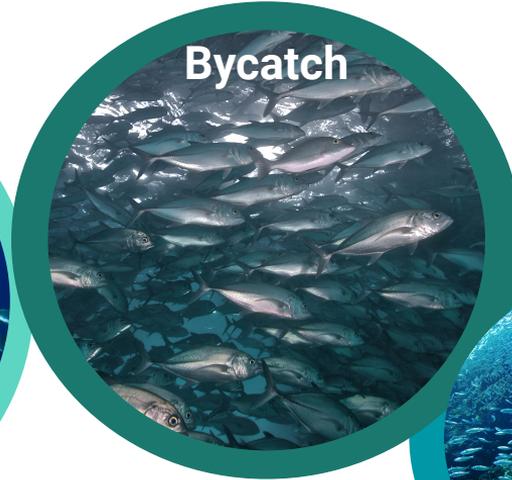
**Wild-capture  
fishing**

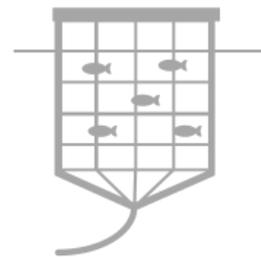


**Aquaculture**

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# Alternative seafood eliminates concerns with wild-caught seafood





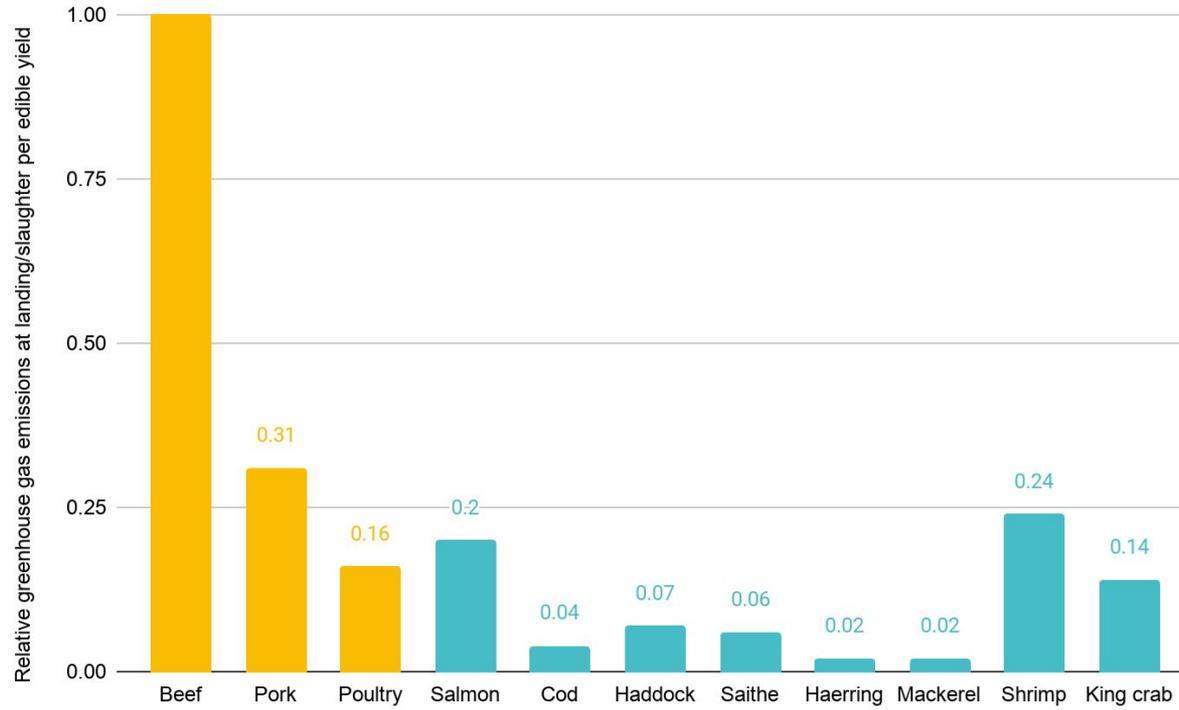
# FAIRR report shows aquaculture investment risks



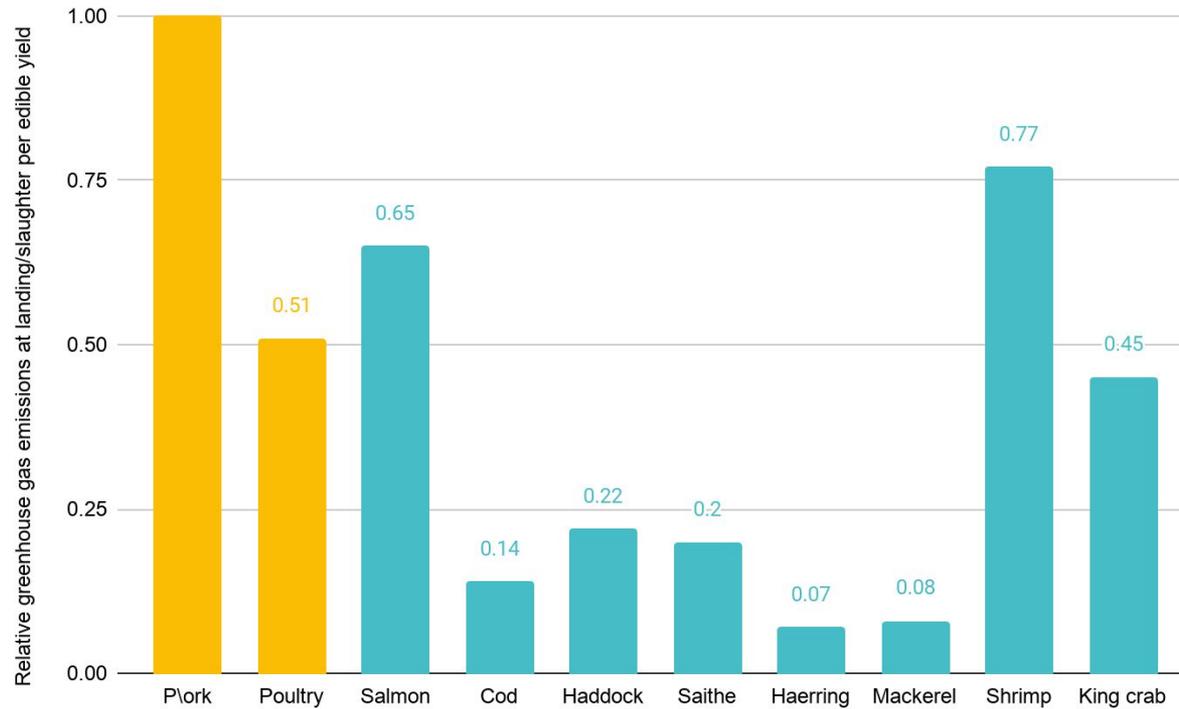
This slide is reproduced courtesy of the FAIRR initiative, a global investor network focused on risk and opportunity in protein supply chains.

For more information please see [www.fairr.org](http://www.fairr.org)

# Greenhouse gas emissions of seafood



# Seafood emissions relative to pork



# Efficiencies of alternative seafood supply chains

Because alternative seafood can be more **demand-driven** than conventional seafood, producers are able to:

Respond quickly to changes in demand



Locate facilities close to demand centers



Only produce what consumers want



Reduce waste



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# The current landscape

# Three categories of alternative seafood

PLANT-BASED  
PROTEINS

*Sophie's*  
KITCHEN



FERMENTATION

Quorn™



CULTIVATED MEAT

WILD  
TYPE



# Plant-based seafood

Using plant-derived ingredients to replicate the flavor and texture of seafood



\*Often thought of as “plant-based”  
Quorn actually uses fermentation to create its signature ingredient, mycoprotein

# Plant-based seafood startups



Plant-based tuna,  
shrimp, and salmon



Plant-based shrimp  
using algae, soy and  
pea protein



Plant-based tuna,  
burgers, crab cakes  
using legumes



OCEAN HUGGER  
FOODS, INC™



Plant-based tuna and  
eel alternatives using  
whole vegetable  
ingredients

# New plant-based seafood companies



**Kuleana**  
Plant-based raw bluefin  
tuna sashimi



**Hooked**  
Plant-based shredded  
seafood products



**Wild Skinny Clean**  
Plant-based shrimp and  
crab cakes

# White space in plant-based seafood



**We eat 200-300 different species of seafood.**

Because far more species of fish are consumed compared to species of land animals, there are nearly endless opportunities to develop novel products.



**Most plant-based products are ground or minced.**

With more sophisticated manufacturing methods, it may be possible to create the layers of fat, collagen, and protein that give fish its desirable cooking properties like flakiness.



**Very few products are in the fresh, refrigerated category.**

Most plant-based seafood products are either shelf-stable or frozen. Plant-based seafood could build on the long-standing success of refrigerated plant-based milk and the momentum of fresh plant-based burger growth.

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# Cultivated seafood could reach the market before cultivated terrestrial meat

Potential technical advantages:

1. Can grow in lower temperature
2. Can grow in low oxygen conditions
3. High buffering capacity - ability to maintain neutral pH
4. Rapid growth of muscle cells
5. High expression of telomerase
6. Simple structure relative to muscle tissues found in many terrestrial animals.



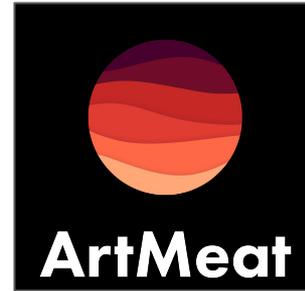
Photo credit: Wild Type Foods

For more detail, see: Rubio, N., Datar, I., Stachura, D., & Krueger, K. (2019). Cell-based fish: a novel approach to seafood production and an opportunity for cellular agriculture.

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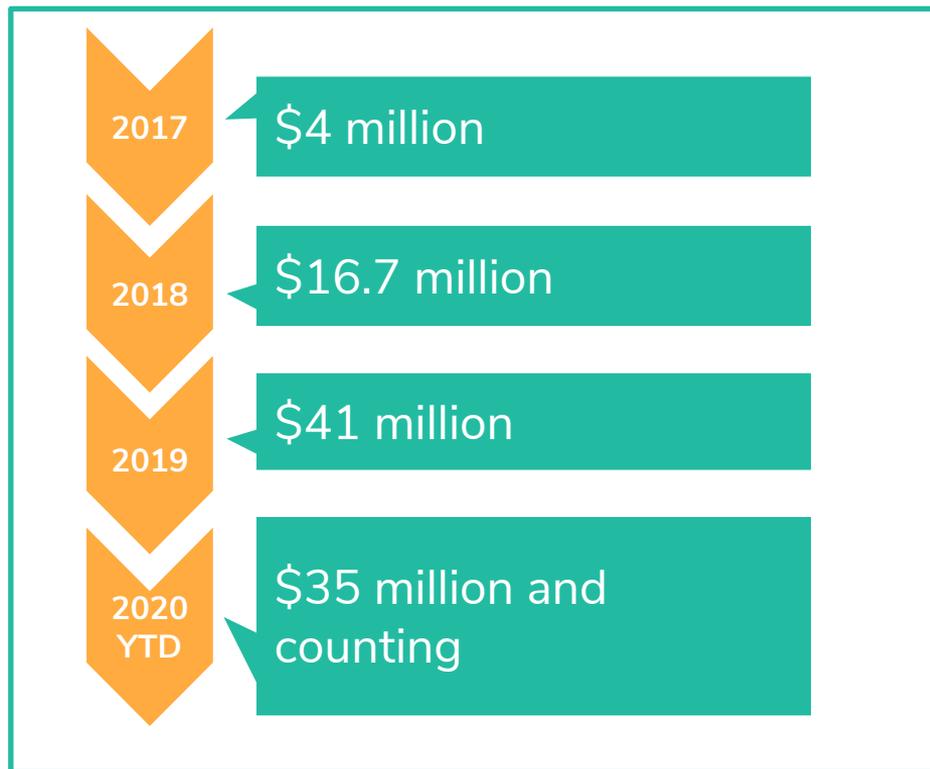
# Cultivated seafood

Produced by cultivating cells from marine animals





# Recent investment activity



# Plant-based seafood

accounts for just \$9.5 million (1%) of total plant-based meat dollar sales - **Plant-based seafood is a market white space.**

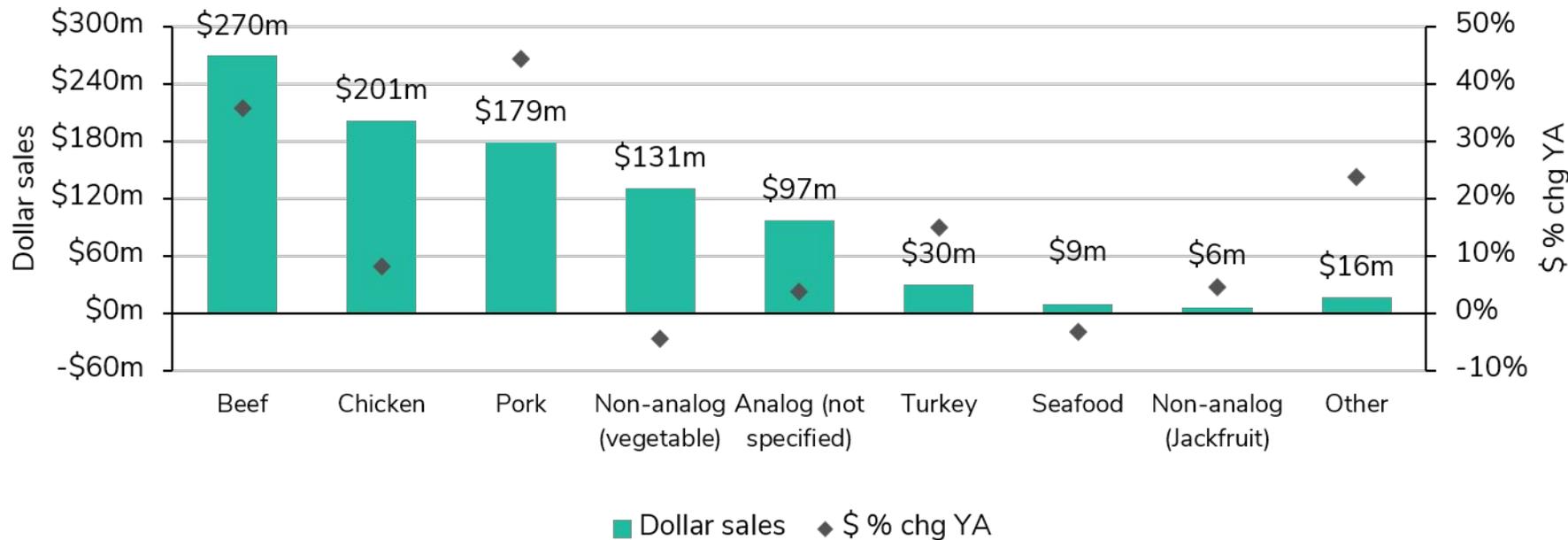


Photo courtesy of Hungry Planet

Note: the data presented on this slide 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 versions of beef, poultry, and pork products make up more than 60% of plant-based meat sales

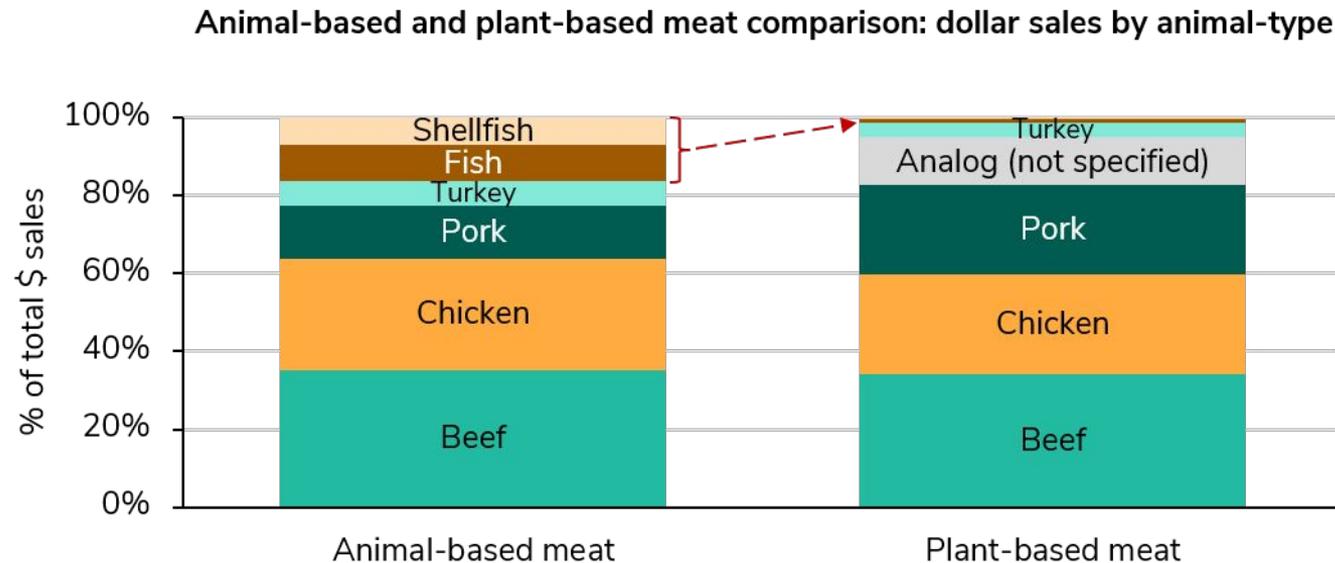
Plant-based meat dollar sales and YoY growth by animal-type  
2019



Note: the data presented on this slide 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.

Source: SPINSscan Natural and Specialty Gourmet (proprietary), SPINSscan Conventional Multi Outlet (powered by IRI), 52 weeks ending 12-29-2019

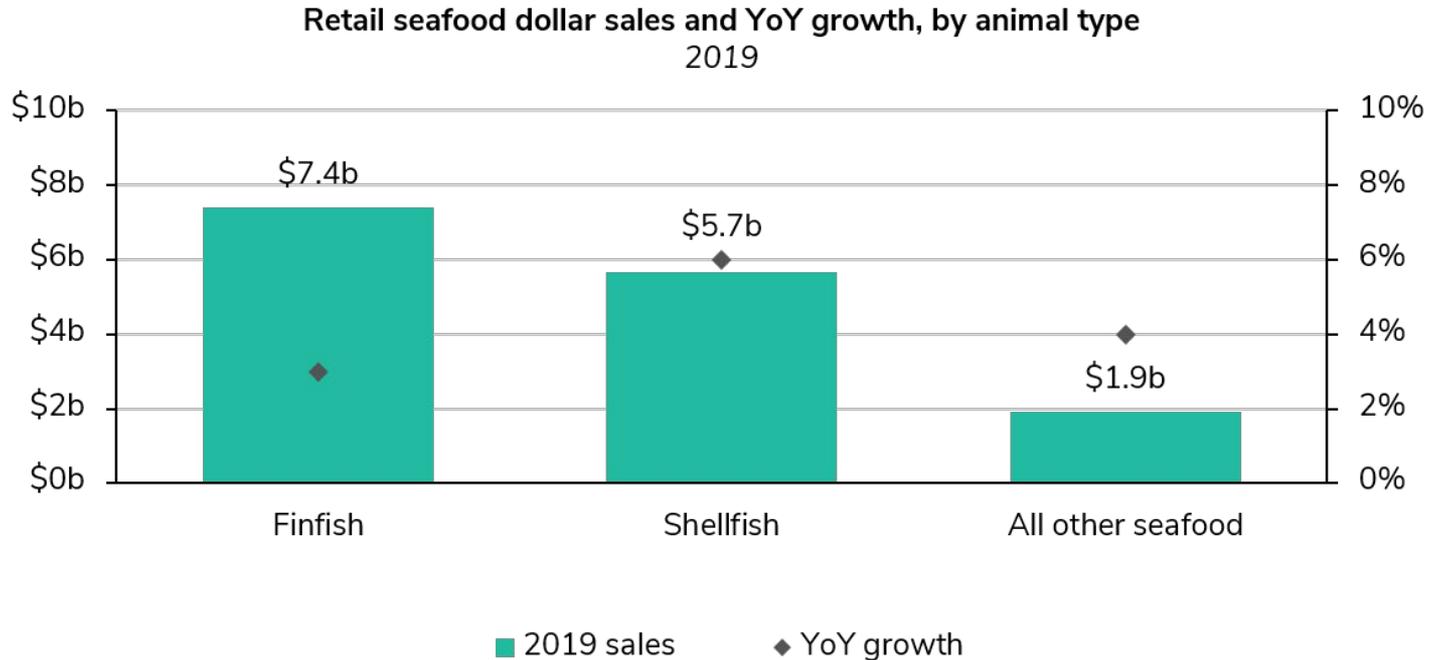
# Fish and shellfish are underrepresented in the plant-based meat market



Note: Animal-based meat dollar sales for year ending August 2018; plant-based meat dollar sales for year ending April 2019; the data presented on this slide 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.

Source: Nielsen custom defined data set, xAOC + WFM, 52 weeks ending 8/11/18; SPINSscan Natural and Specialty Gourmet (proprietary), SPINSscan Natural and Specialty Gourmet (proprietary), SPINSscan Conventional Multi Outlet (powered by IRI), 52 weeks ending 12-29-2019

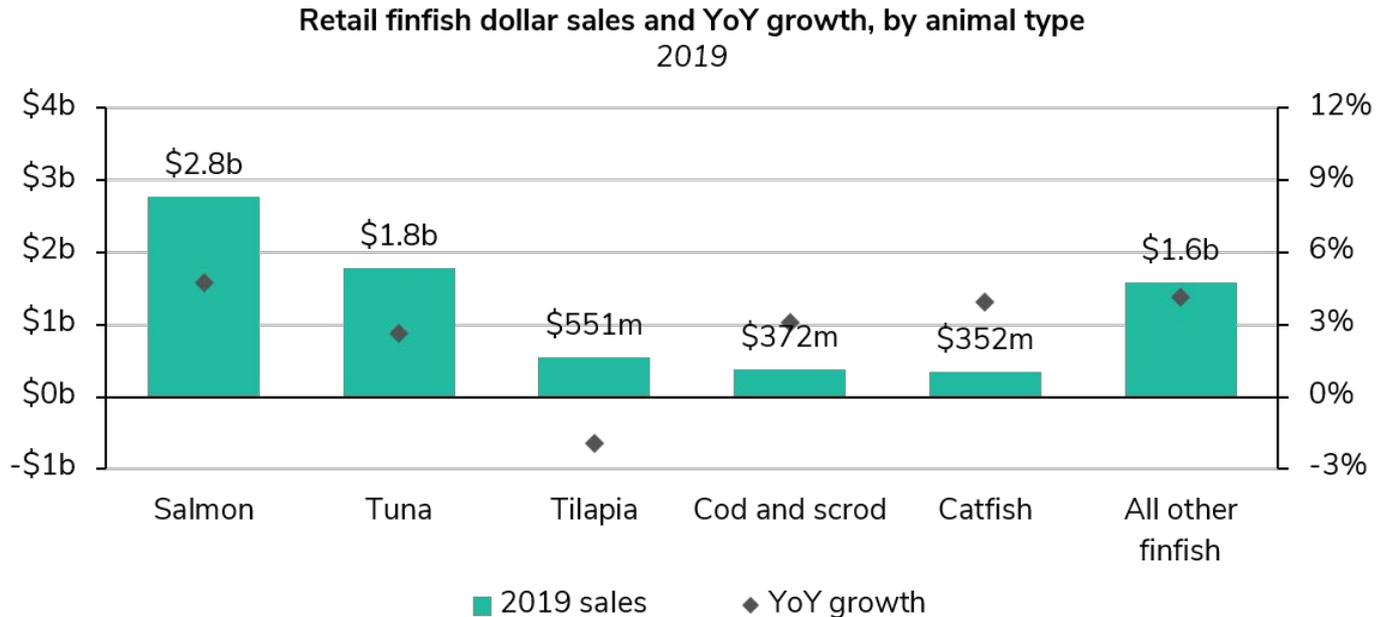
# The retail seafood category is worth \$15b, with finfish accounting for ~50%, and shellfish for ~ 1/3



Note: "All other seafood" includes sushi, complete meals, octopus, squid, caviar, meal kits, snacks, and combination packs

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

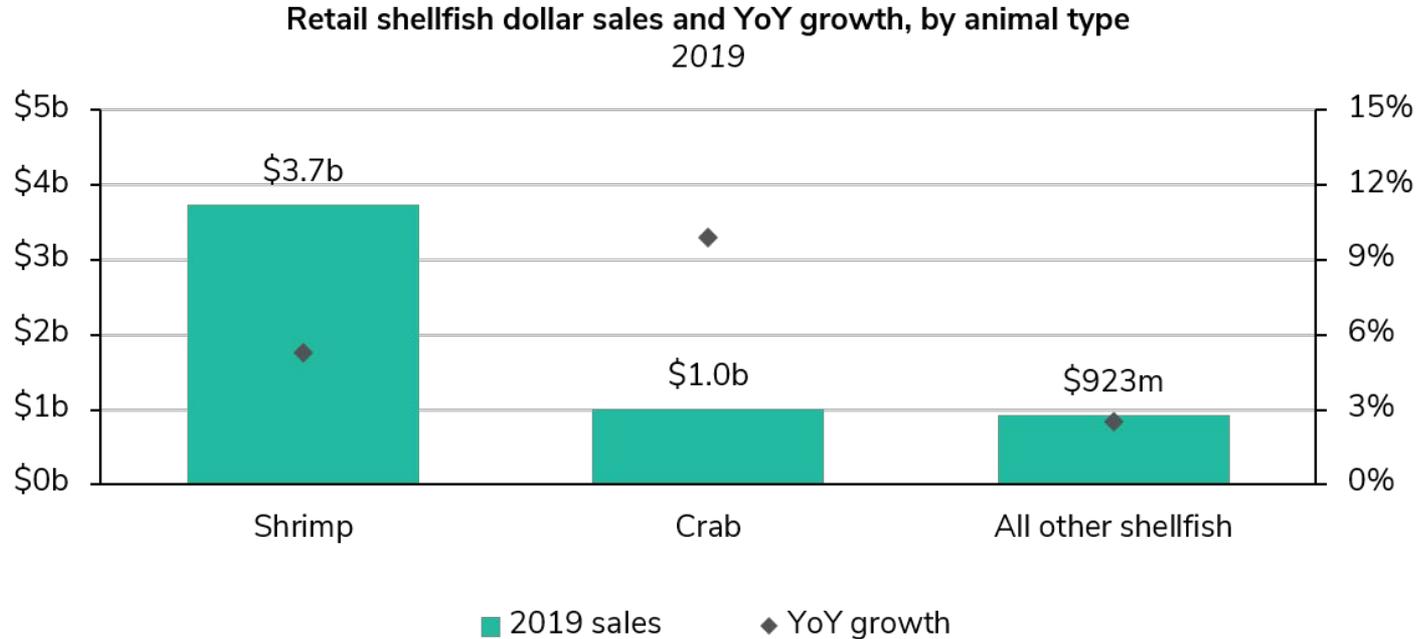
# Within finfish, salmon and tuna comprise the majority of volume at over 60% of dollar sales



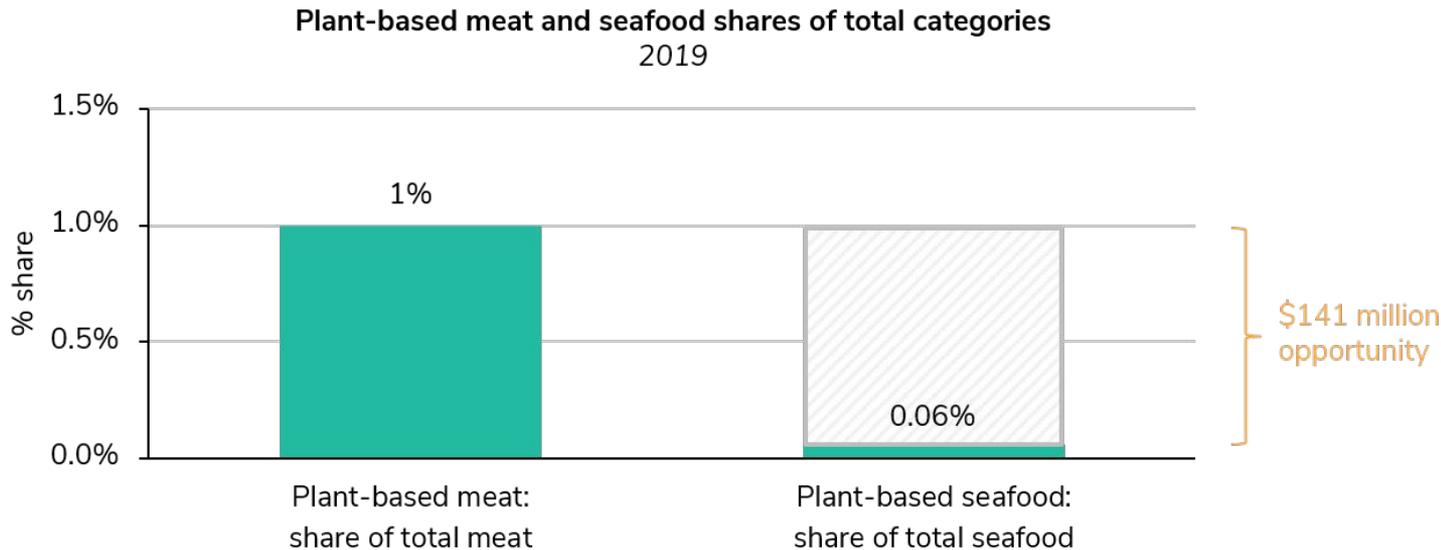
Note: "All other finfish" includes anchovy, flounder, grouper, haddock, halibut, herring, mackerel, mahi mahi, perch, pollock, roughy, sardine, sea bass, snapper, sole, swordfish, trout, and whiting

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

# Shrimp makes up the majority of shellfish sales, followed by crab



# The opportunity for plant-based seafood to reach just 1% share of the seafood market is worth \$141 million



Note: SPINS does not report non-UPC meat counter sales. To account for this, the plant-based meat total retail share calculation uses the \$95 billion total meat market size reported by Nielsen, as this number includes both retail packaged meat sales and non-UPC meat counter sales. The plant-based data presented on this slide 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.

Source: SPINSscan Natural and Specialty Gourmet (proprietary), SPINSscan Conventional Multi Outlet (powered by IRI), 52 weeks ending 12-29-2019; Nielsen (2019), [The F Word: Flexitarian Is Not a Curse to the Meat Industry](#)

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# Incumbent protein companies are getting on board

**Broaden**

their consumer base by making something for everyone.

**Appeal**

to the next generation of protein consumers.

**Enhance**

their sustainability and social responsibility stories.

**Diversify**

sources of supply and investments to increase resilience to shocks.

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# Tyson Ventures

- Invested in plant-based seafood company New Wave Foods in September, 2019



Photo credit: New Wave Foods

*“I tasted it for the first time in a cafe in Palo Alto, and I had no idea I was eating plant-based shrimp.”*

- *Former Tyson Ventures CFO Tom Mastrobuoni*

# Van Cleve Seafood

- Virginia family-owned seafood company
- Launched plant-based shrimp and plant-based crab cakes in new line in october, 2019



Photo credit: The Van Cleve Seafood Co.

*“We see the trend turning into more of a movement and wanted to create something to satisfy everybody. Since we know seafood so well, who better than us to create the plant-based alternatives that taste just like the real thing?”*

- *Shelly Van Cleve, co-owner and VP of Product Development, the Van Cleve Seafood Co.*

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## Nutreco

- Announced strategic partnership with BlueNalu in January, 2020



*“Since the global demand for protein is increasing, we need to provide protein from a variety of sources, including traditional aquaculture farming as well as new innovative solutions. Nutreco’s strategic partnership with BlueNalu is very exciting as it opens the opportunity to up-scale real seafood production in a highly sustainable way.”*

*- Rob Koremans, CEO, Nutreco*

# Bumble Bee Foods



- Joint Venture with Good Catch announced March, 2020
- CEO joined board of Gathered Foods in April, 2020



Photo credit: Good Catch Foods

*"It is critically important that as an industry we continue to find innovative solutions to decouple growth with environmental impact. Providing great-tasting alternative ways for consumers to enjoy ocean-inspired foods is a key pillar of our long-term commitment to ocean health."*

- *Jan Tharp, President & CEO, Bumble Bee Foods*

# Alternative seafood is already global



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# Alternative seafood is already global



# Keep up with the news from GFI



Sustainable Seafood Initiative newsletter  
(launching this summer)

<https://go.gfi.org/seafood-newsletter>



Plant-Based Insider

<https://www.gfi.org/insider>



GFI e-news

<https://www.gfi.org/e-newsletter>

The screenshot displays the 'Plant-Based Insider' newsletter sign-up page. At the top, the GFI logo is visible. Below it, a banner features the text 'Plant-Based Insider' and the tagline 'The latest news & opportunities for the plant-based industry'. A section titled 'What do you want to read in the Plant-Based Insider?' includes a survey link and a 'Take the survey' button. The main content area discusses the excitement of working in the plant-based industry, mentioning 'Beyond Meat' (up 163%), 'Burger King' and 'Del Taco' adding plant-based meat, and 'Chick-Fil-A' investigating plant-based options. It also notes the increasing number of state-level label censorship bills, similar to one passed in Missouri. A 'Policy Update' section is partially visible at the bottom, mentioning 'Label Censorship bills' and Missouri's recent adoption of a law.