

Cultivated Seafood Review

June 25, 2020

changing  tastes

A Look Ahead

- How will we eat fish and seafood in the U.S. over the next 3-5 years?
- Where will we eat it?
- What are the opportunities to shift us away from wild capture and conventional aquaculture fish and seafood and towards alternatives?
- What do the gatekeepers think?

Where We Looked

- A decade of on-line menus.
- A survey of 3,000+ adult U.S. consumers.
- Surveys and discussions with menu and purchasing decision makers who already buy fish and seafood.
- Implications of COVID 19 response.

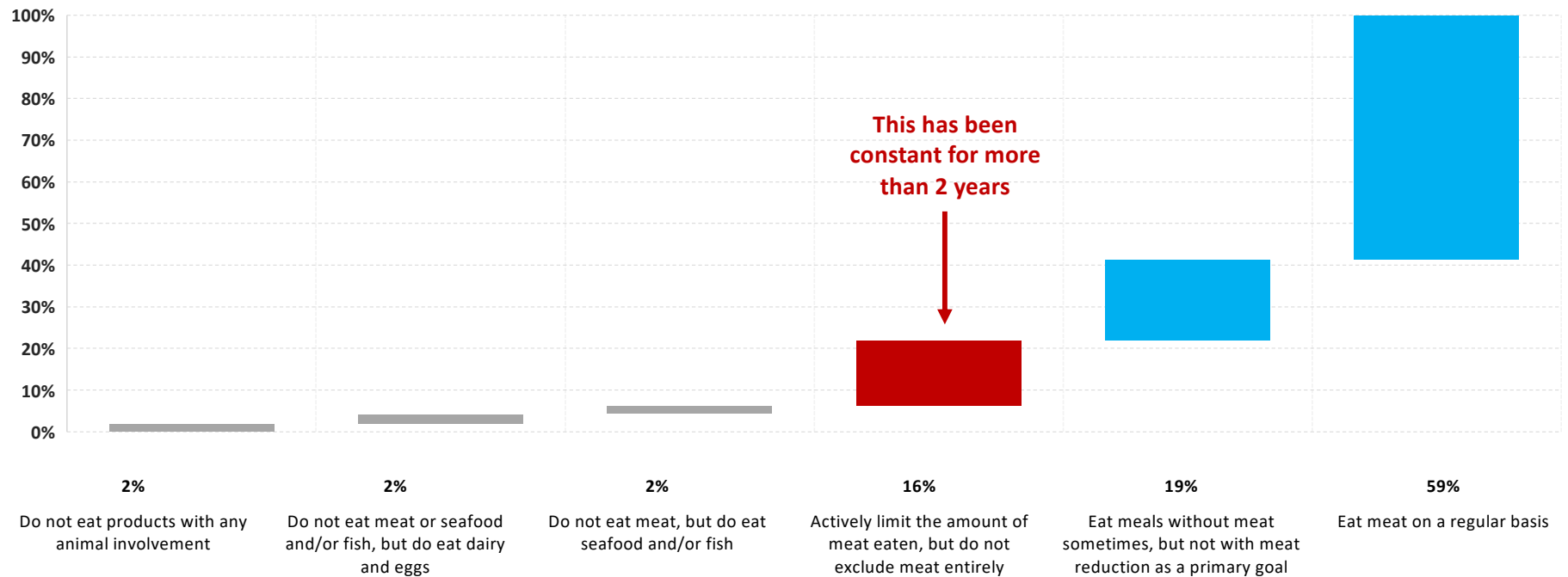


Key Findings



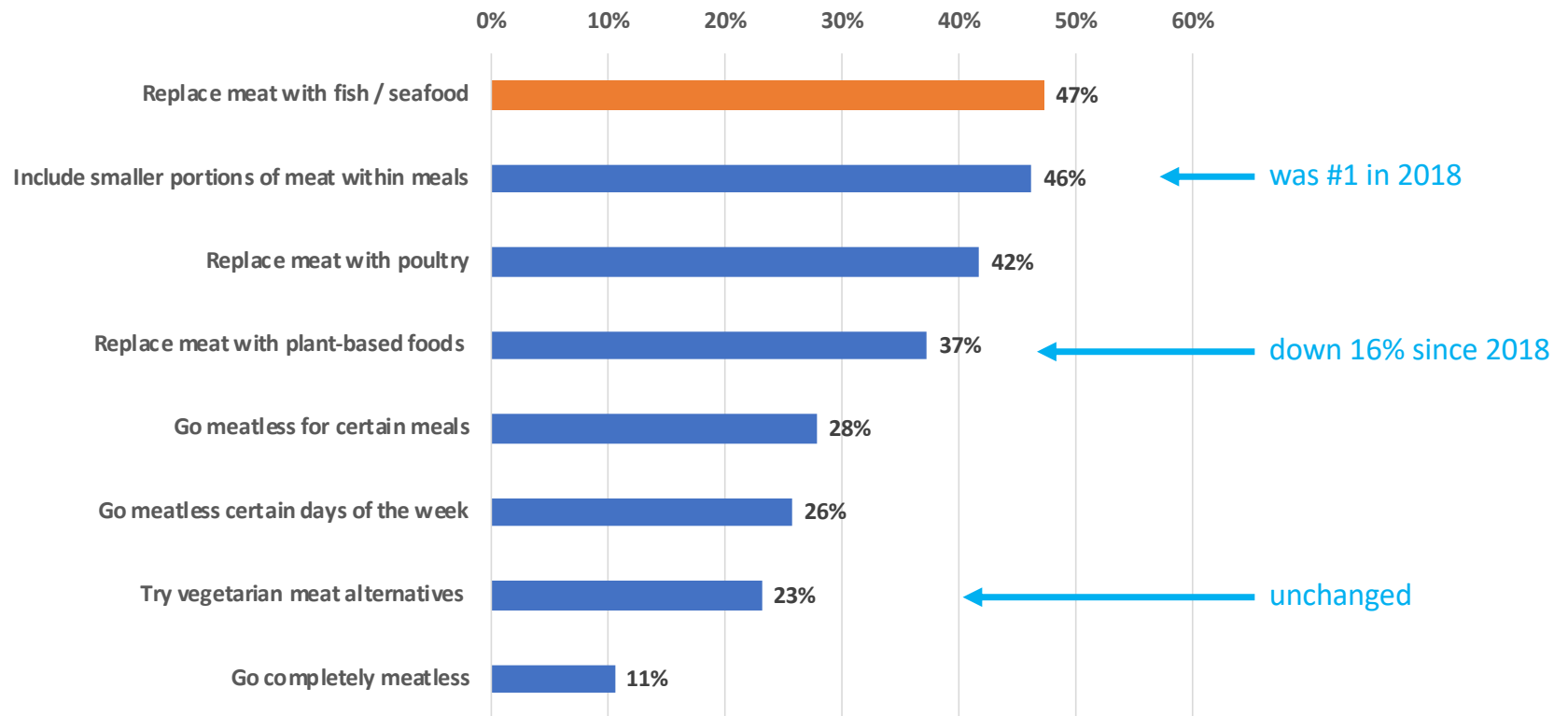
Fish and Seafood Consumption Poised to Increase in the U.S.

Search for new proteins and increasing diversity of animal proteins are drivers

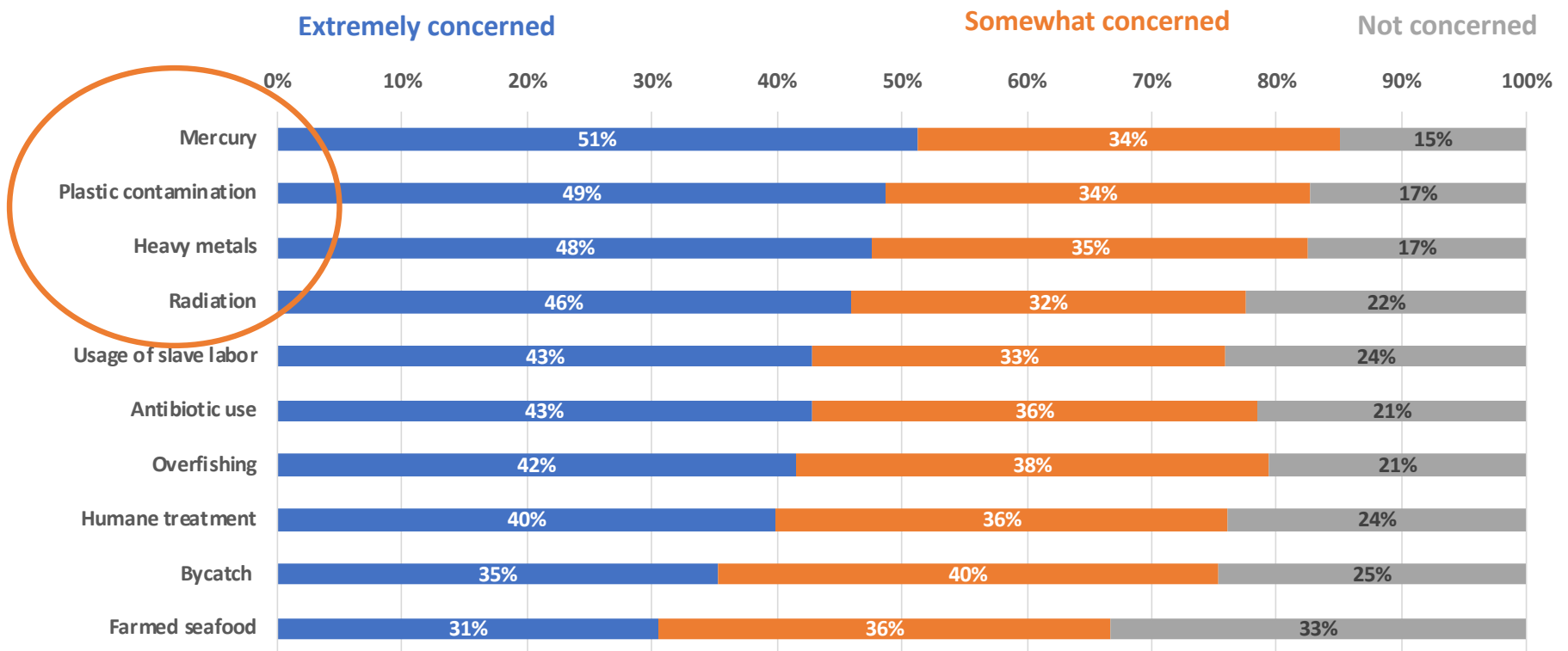


Fish and Seafood are Now the Preferred Replacements

Interest in plant-based alternatives is declining...along with actual rate of growth



But Consumer Concerns are Preventing Increased Consumption



The New Wisdom:

Ocean Health
and Our Health
are Connected
through Fish and
Seafood

- ✓ 93% of people eat fish
- ✓ Half do so for health reasons (omega 3s, heart health)
- ✓ Only 17% think it's safer to eat than other protein choices



Millennials are More Concerned Boomers and Silents Less So

How concerned, if at all, are you with each of the following as it pertains to fish and seafood? Select one per row.

	GENPOP	Gen Z	Millennial	Gen X	Boomer/ Silent
Mercury	85%	80%	88%	82%	87%
Plastic contamination	83%	84%	86%	81%	81%
Heavy metals	83%	84%	86%	80%	81%
Antibiotic use	79%	74%	84%	78%	74%
Overfishing	79%	81%	83%	77%	78%
Radiation	78%	81%	85%	76%	70%
Usage of slave labor	76%	79%	83%	75%	70%
Humane treatment	76%	76%	84%	76%	69%
Bycatch	75%	79%	80%	76%	70%
Aquaculture (Farming) Impacts	67%	71%	76%	67%	56%

The decline in ocean health including plastic pollution is rewriting the narrative that Americans prefer wild fish, which remains even more true among older Americans.

Key Findings

- Women are especially concerned and skeptical about how fish is produced. Less accepting of any production practice than men.
- Preference for wild erodes with age. GenZ has less established preference for wild. GenX also lower than GENPOP.
- People who try to eat healthy are less likely to prefer wild fish than the GENPOP.

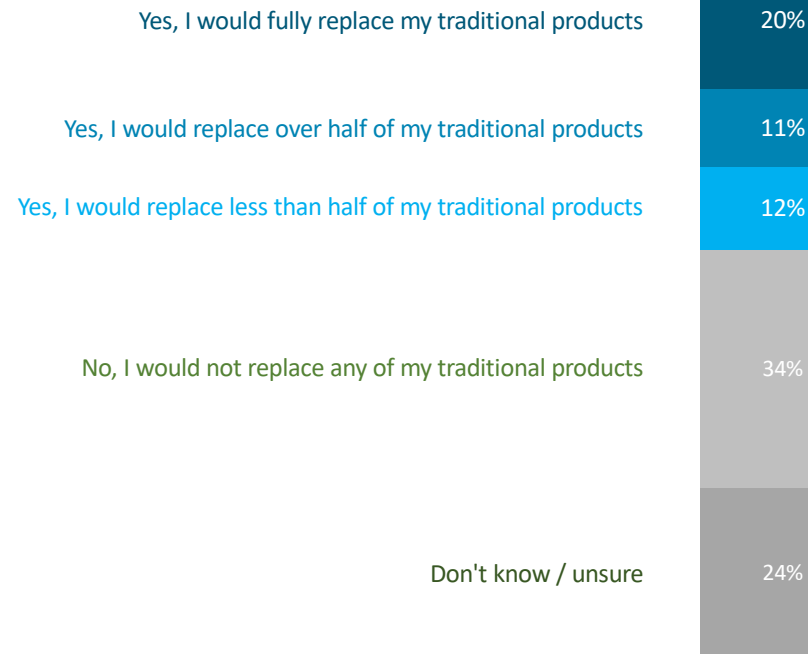
	TOTAL	Male	Female	Gen Z	Millennial	Gen X	Boomer/ Silent	Foodie	Try to eat healthy
Cellular aquaculture	42%	54%	28%	39%	57%	45%	22%	60%	32%
Farming fish / seafood near or on the shore	53%	66%	40%	42%	63%	56%	42%	67%	45%
Farming fish / seafood in nets or pens in the deep waters of the open ocean	54%	65%	41%	34%	65%	56%	42%	67%	46%
Wild caught fish / seafood	71%	78%	63%	54%	75%	70%	70%	79%	66%
Cellular agriculture	39%	52%	25%	33%	55%	42%	19%	58%	29%

Consumer attitudes supporting the older narrative that fish is the healthy choice are in decline and provide additional opportunities to drive down the consumption of wild capture fish to achieve 30 X 30.

Consumers Already Showing Acceptance

- Remarkable acceptance can be activated in the market.
- Ocean health concerns can be leveraged.

- Acceptance of all aquaculture increasing.
- Cellular has surprisingly wide acceptance ahead of introduction.
- The American consumer public is **already sufficiently interested in eating cellular seafood to place the goal of "30 X 30" within reach.**
- 30% of Americans are already willing to replace some or all of their current seafood consumption with cellular.



43% of consumers would consider replacing all or at least some of their current fish and seafood with cellular.

16% of consumers plan to eat more alternative seafood products.

33% of consumers say they never will.

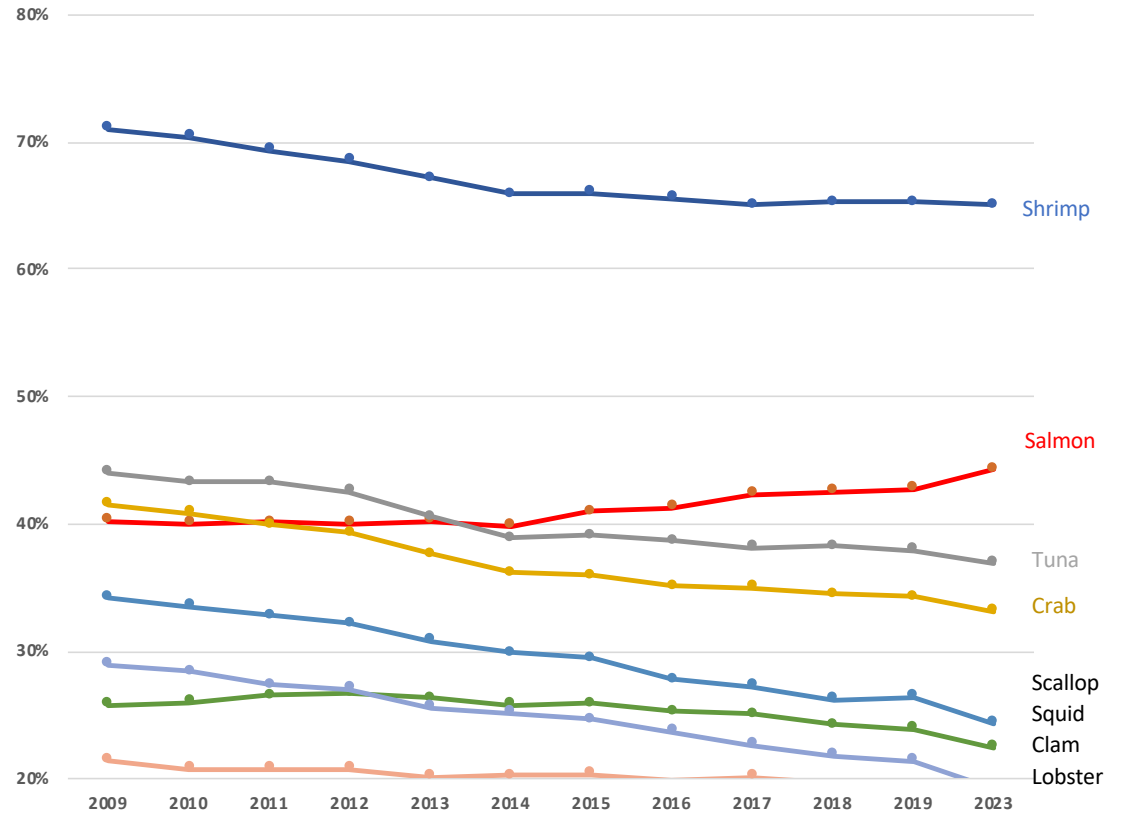


Types of Fish and Seafood

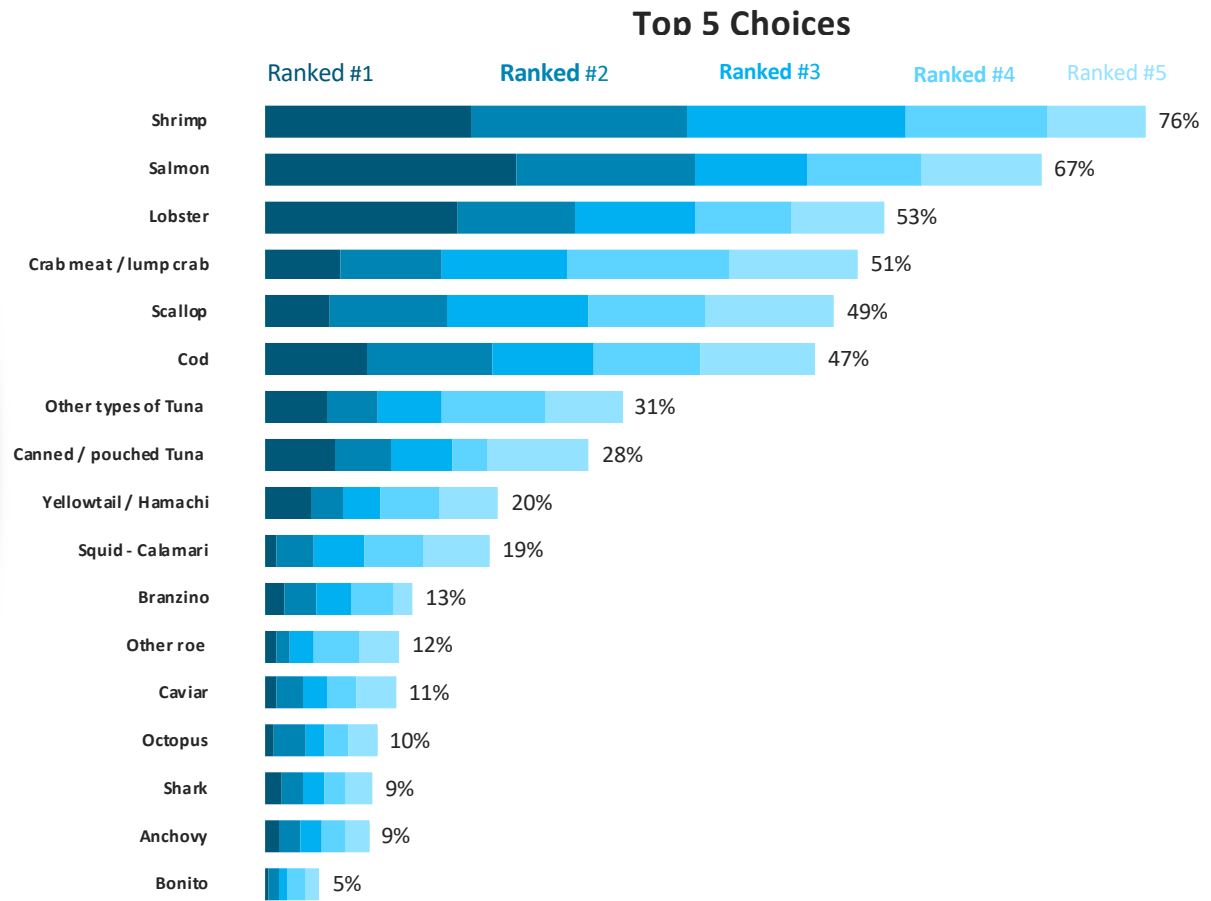
We don't have to replicate the current offer!

Favored Fish are Shifting Below the Surface

Share of U.S. Menus Offering



Setting aside Price, Gatekeepers are *most* Interested in Menuing Shrimp, Salmon, and Lobster



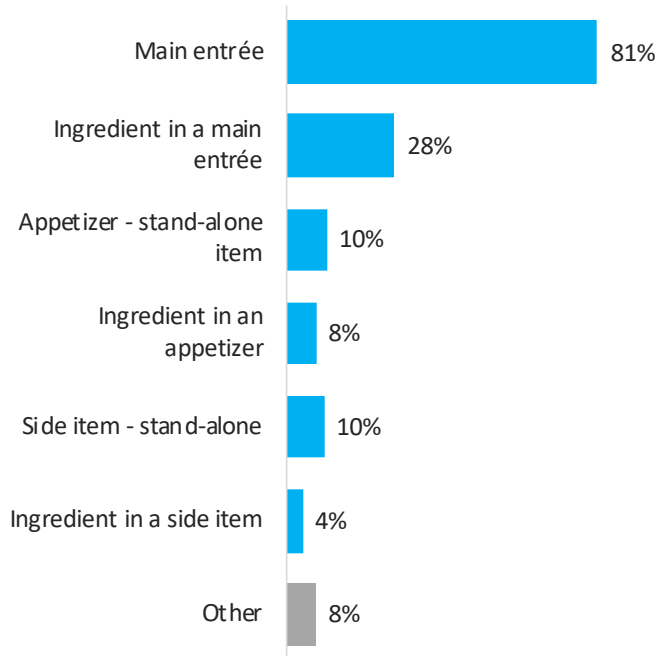
Salmon is typically offered as a main entrée, usually in 4-6 oz pieces.

« Most operators would prefer the salmon come with the skin already off.

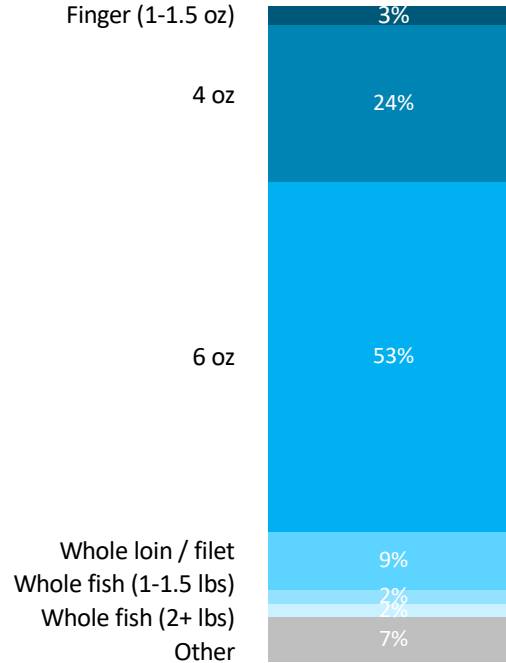
ADDITIONAL SALMON PREFERENCES

among those who offer salmon

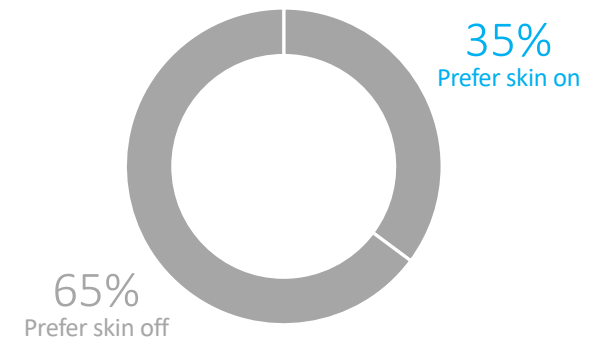
Menued today



Ideal portion size



Skin preference

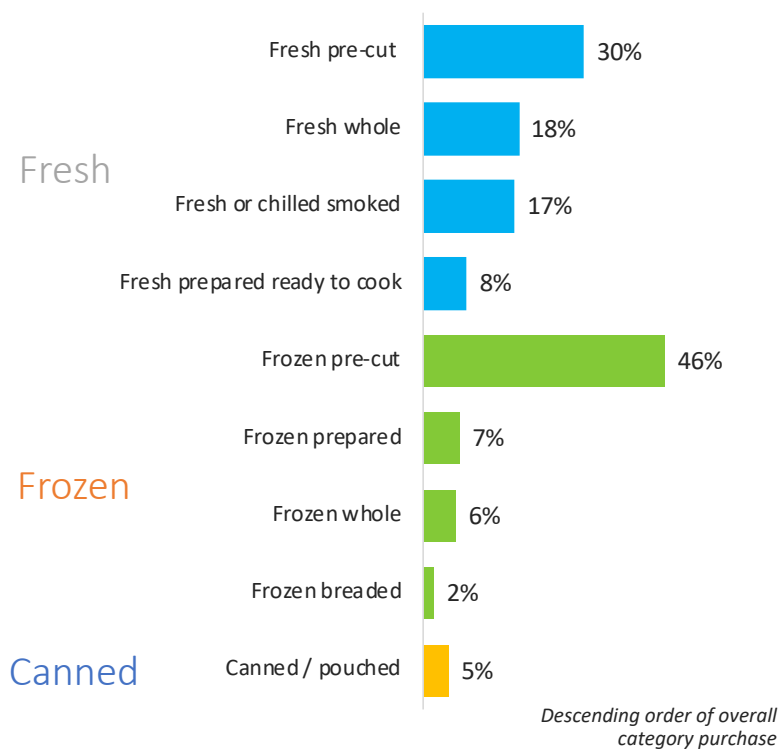


Pre-cut salmon is widely purchased today and preferred, especially frozen.

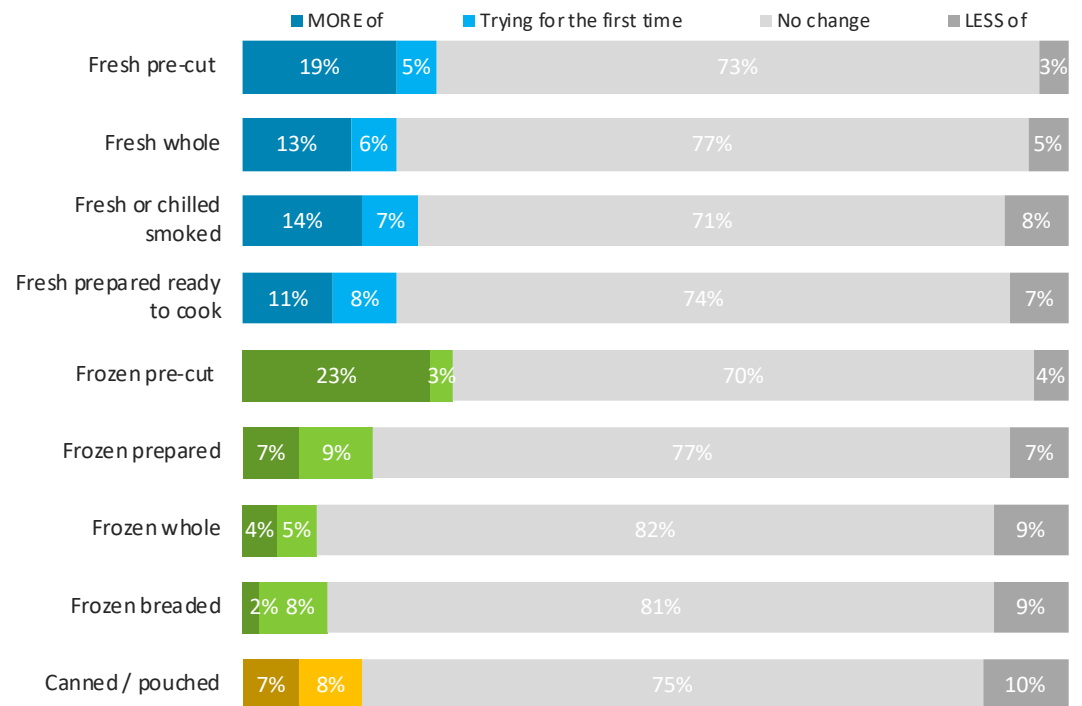
SALMON FORMATS

among those who offer salmon

Purchase today



Future buying interest



“Cooking” Methods will Continue to Evolve





Plant-Based Fish and Seafood



There is No
Seafood **Burger**



Clean Ingredients Matter

- Launch occurred alongside the clean ingredient movement.
- Big protein companies recognize this, and their product offerings are “clean” by comparison.

Gatekeepers Need to Understand Comparable End use Pricing

- Culinary flexibility and appropriate application.
- Edible amount by weight and yield.
- Savings from avoided on-site prep and hygiene.

Delivery Strategy Needed to Avoid Hurdles

- Costs of long-haul shipping for refrigerated prepared items.
 - Perceived value of plant-based dry “mush” are hurdles for achieving significant market share.
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COVID19 Implications

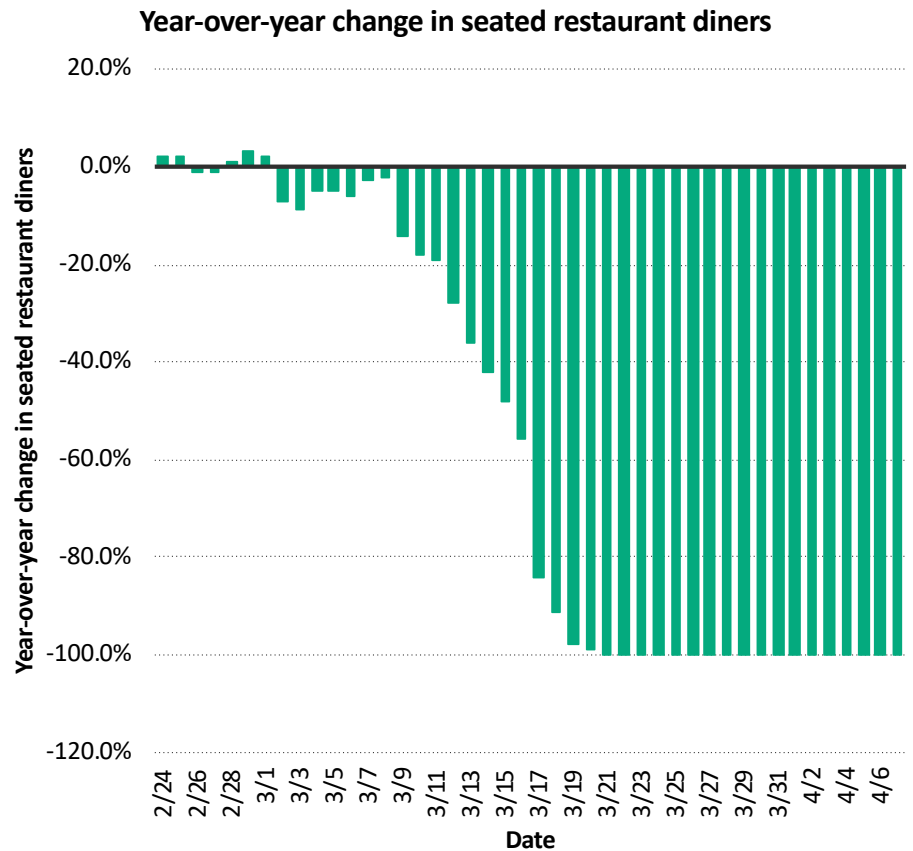


COVID 19 Implications

Over 70% of seafood sales in the U.S. have been “away from home” and more in full-service, seated formats.

Between 70-85% of independent full-service restaurants will not re-open.

Take-out has become a larger part of the offer.



COVID 19 Implications

- Ghost Kitchens went *from a blip to the new norm*.
 - Pre-Covid there were 352; now about 15% ($\pm 70,000$).
 - New and easier channel for piloting and introducing cellular and plant based seafood and handling all types of products.
- Pick Up and Delivery will garner a larger share of meals at home.
 - Pre COVID only 37% of independents.
 - Now a part of almost every restaurant.





**Opportunities
Ahead for the
Alternative
Seafood
Industry**

Amazingly High Receptivity

for cultivated seafood among consumers for a product that doesn't exist on market.

- Ocean health recognition may be major driver.
 - Increasing awareness of ocean health issues and COVID19 contamination issues can further shift gatekeeper and consumers away from wild fish and towards cellular (and advanced RAS/self-contained recirculating aquaculture).
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Don't Need to Replicate What We Already Harvest or Produce

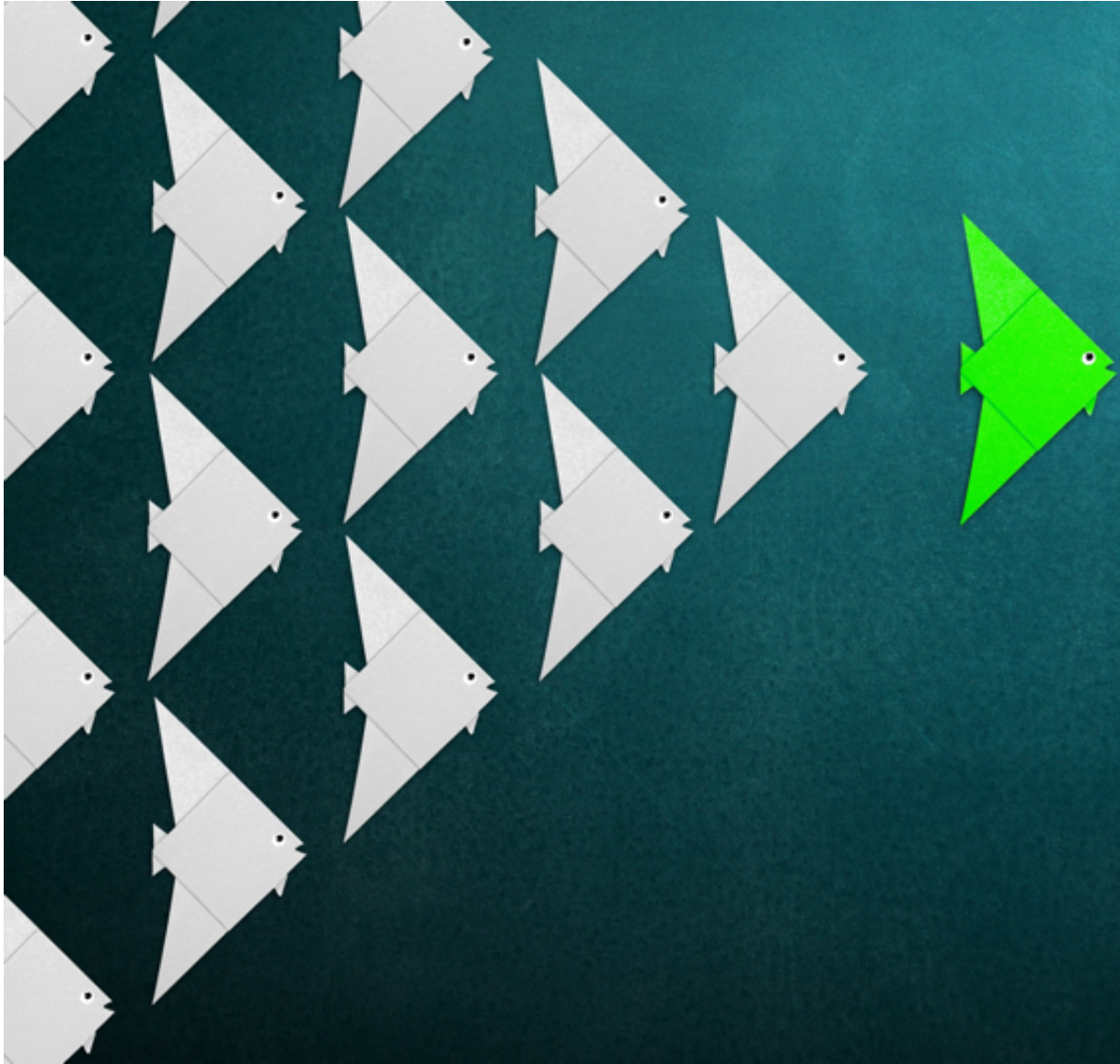
- Scallop, crabmeat (picked analog), lobster all can replace finfish.
- Preference for more homogenous ingredients can simplify development and speed to market.
- Substantial specific opportunities in:
 - Producing thin layers of finfish that can be cured and smoked.
 - Producing scallops.
 - Producing crab meat replacements.



Ready to Serve Opportunity

- Quick win to launch this format.
 - Avoid design that can handle a wide variety of cooking techniques.
 - Most cooking techniques work to:
 - Removing water from fresh product.
 - Have product absorb other flavors through liquid medium.
 - Achieve Maillard Reaction (browning).
 - All add cost to final product.
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For more information

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