



Plant-based colors for fish alternatives

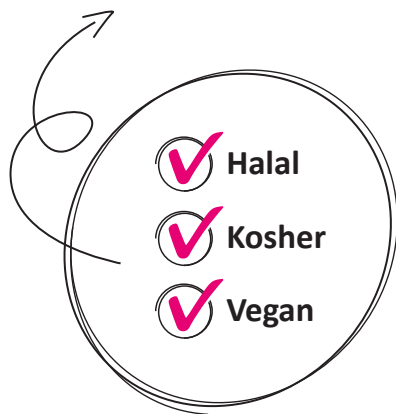
GROWING COLORS

EXBERRY®

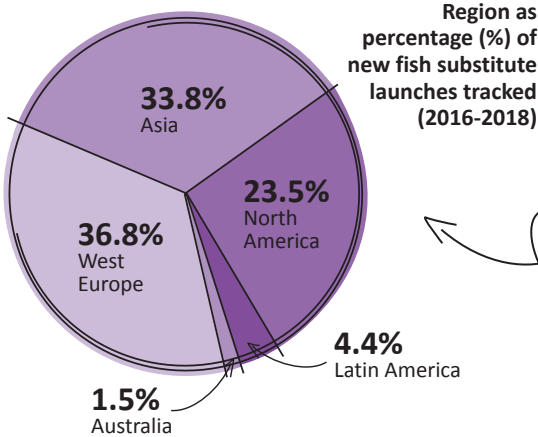
What are the numbers?

Demand for plant-based meat, dairy and cheese alternatives is growing, and the next boom could come in plant-based fish and seafood substitutes.

Forbes has tipped vegan seafood to become 'big business'¹, while the Financial Times described it as the 'new plant-based meat'.² A wide range of plant-based seafood is now available, from scampi and crabcakes to canned tuna and smoked salmon, as manufacturers develop innovative new ways to recreate different tastes and textures.



Plant-based seafood still represents a tiny fraction of the global seafood market.³ In the U.S., a Nielsen study conducted for The Good Food Institute found annual sales of fish substitutes were around \$9.3 million in 2018. While that represents only around 1% of the \$800 plant-based meat substitutes category, plant-based seafood sales in the country grew 19% between 2017 and 2018.⁴ The majority of fish substitute launches in the 2016-2018 period were in Western Europe (36.8%), Asia (33.8%) and North America (23.5%), suggesting there is significant growth potential across the world.⁵



Why plant-based fish alternatives?

A global Ipsos MORI study in 2018 showed that 3% of consumers were vegan, 5% were vegetarian and 14% were flexitarian, eating meat or fish only occasionally.

In addition, nearly seven million people in the U.S. alone are allergic to shellfish⁶, and fish is also among the FDA's top eight major food allergens.⁷ Health concerns may also lead consumers to avoid consumption of fish and shellfish contaminated with methylmercury⁸, while microplastics in sea-



EXBERRY® COLORING FOODS ARE AVAILABLE IN THE FORMATS:

- LIQUID
- POWDER
- MICRONIZED POWDER
- OIL DISPERSIBLE
- ORGANIC

food is another issue that has attracted attention.⁹ Another significant factor is the growing concern around overfishing. In 2015, 33.1% of fish stocks were fished beyond biological sustainability, while 59.9% were fished at the maximally sustainable level.¹⁰ There are also issues around the sustainability of fish farming, including the use of wild fish stock for feed and the use of antibiotics.¹¹

How can EXBERRY® Coloring Foods help your business?

Some plant-based seafood alternative products can create challenges in terms of texture, but manufacturers are now developing innovative ways to mimic the flakiness of fish.¹²

Many of the current analogue products are based on soy, pea, lentil and chickpea, mainly processed by extrusion or created by mixing proteins with stabilizing systems and a heating step. Both of these processes, in combination with high pH values, are challenging for many clean-label, plant-based colors.

The task is to find the Coloring Food combination for your specific fishless fish application. With more than 40 years' experience in Coloring Foods, GNT is perfectly placed to find the ideal solution.

Plant-based color solutions for plant-based fish alternatives

For plant-based products to successfully mimic fish and seafood, a fresh and appealing appearance is crucial. And in this health- and ethics-driven category, consumers are particularly likely to demand clean-label, plant-based ingredients.

The combination of high pH and heat treatment presents challenges for natural red color shades, but EXBERRY® Coloring Foods can deliver a perfect



solution. Sourced only from fruits, vegetables and edible plants, they can help you create new color concepts for seafood alternatives without having to compromise on appearance or quality. In addition, they tap into consumer expectations of clean and clear labelling.

EXBERRY® Coloring Foods

There are more than 400 shades available in the EXBERRY® Coloring Foods range. Below are some of options that can be used to deliver the ideal appearance to your fish and seafood alternative products.

To find out more about how our Coloring Foods can help you unleash the full potential of your plant-based fish and seafood products, please get in touch. We offer a full support package.

Sources: ¹ Forbes, 'Vegan Seafood Is About To Become Big Business-- And Not A Moment Too Soon' (2018), ² Financial Times, 'Plant-based fish is the new plant-based meat' (2019), ³ The Good Food Institute, 'An Ocean of Opportunity: Plant-based and cell-based seafood for sustainable oceans without sacrifice' (2019) ⁴ Wall Street Journal, 'Fish: The Final Frontier in Fake Meat' (2018), ⁵ Innova Market Insights, ⁶ American College of Allergy, Asthma and Immunology, 'Shellfish Allergy', ⁷ U.S. Food & Drug Administration, 'What You Need to Know about Food Allergies', ⁸ World Health Organization, 'Mercury and health', ⁹ Smith, M. et al. 'Microplastics in Seafood and the Implications for Human Health' Current Environmental Health Reports (2018), ¹⁰ UN Food and Agriculture Organization, 'The State of World Fisheries and Aquaculture' (2018), ¹¹ FAIRR, 'Shallow returns? ESG risks and opportunities in aquaculture' (2019), ¹² IFT, 'Mimicking Meat, Seafood, and Dairy' (2018)



EXBERRY®	Raw materials	Liquid	Powder
Shade Brilliant Orange	Paprika, carrot	✓	✓
Shade Fiesta Pink	Beetroot, carrot	✓	✓
Shade Vivid Red	Carrot, blackcurrant	✓	✓
Shade Brown	Carrot	✓	✓

COLORING
WITH FRUIT
& VEGETABLES

