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**the support it needs to thrive.**



# Seafish Insight: Fishmeal production and trends

Source: FAO SOFIA 2020.

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## Introduction

**This summary of global fishmeal production and trends is taken from the United Nations Food and Agriculture Organisation (FAO) State of World Fisheries and Aquaculture (SOFIA) report 2020.**

**This flagship publication, issued every two years, provides a comprehensive, objective and global view of capture fisheries and aquaculture.**

Fishmeal is a flour-type material obtained after milling and drying of fish or fish parts, while fish oil is obtained through the pressing of the cooked fish and subsequent centrifugation and separation.

These products can be produced from whole fish, fish trimmings or other fish by-products resulting from processing. Many different species are used for fishmeal and fish oil production, small pelagic species predominating. Many of the species used, such as anchoveta (*Engraulis ringens*), have comparatively high oil yields but are rarely used for direct human consumption.

Fishmeal and fish-oil production fluctuate according to changes in the catches of these species. Anchoveta catches, for example, are dominated by the El Niño phenomenon, which affects stock abundance. Over time, adoption of good management practices and the implementation of certification schemes have decreased the volumes of catches of species targeted for reduction to fishmeal.

To download a copy of the UN FAO State of World Fisheries and Aquaculture (SOFIA) report 2020 see: <http://www.fao.org/publications/sofia/2020/en/>

*This is a summary of the content of the FAO SOFIA Report. It is not necessarily the view of Seafish. It is an information service provided by Seafish for industry and key stakeholders.*

## Overall highlights

Global fish production is estimated to have reached about 179 million tonnes in 2018. Of the overall total, 156 million tonnes were used for human consumption, equivalent to an estimated annual supply of 20.5 kg per capita. The remaining 22 million tonnes were destined for non-food uses, mainly to produce fishmeal and fish oil. Aquaculture accounted for 46% of the total production and 52% of fish for human consumption.

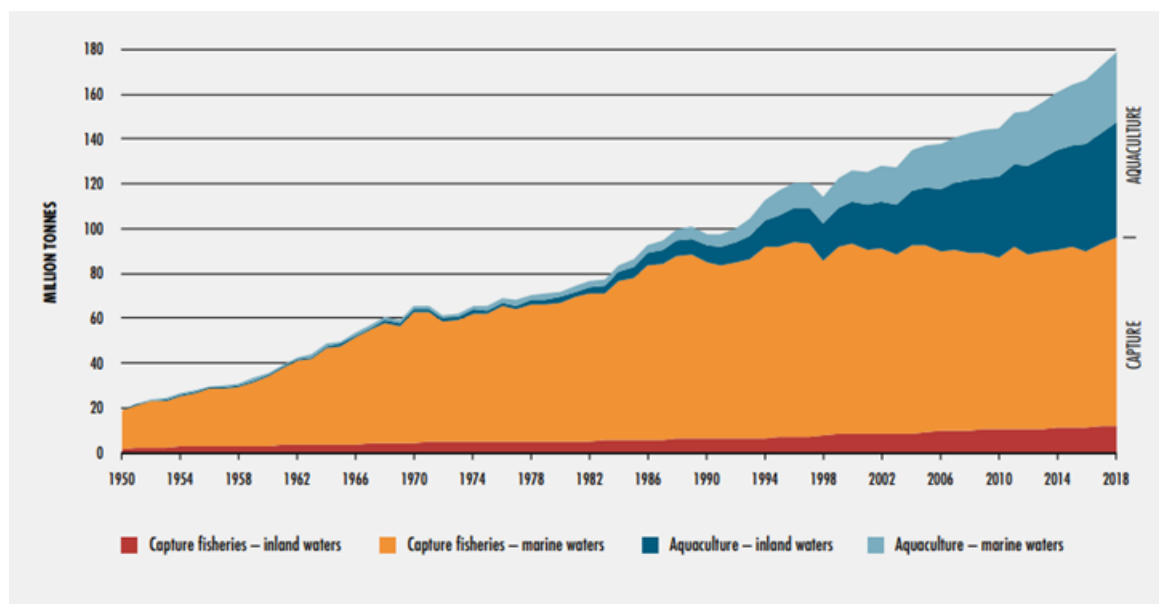
### Total capture

- Global capture fisheries production in 2018 reached a record 96.4 million tonnes, an increase of 5.4% from the average of the previous three years.
- World total marine catch was 84.4 million tonnes, up from 81.2 million (and 79.3 million tonnes in 2016).
- The rise in marine catches resulted mainly from increased anchoveta catches (*Engraulis ringens*) in Peru and Chile.
- The top seven producing countries of global capture fisheries accounted for almost 50% of total capture and the top 20 producing countries accounted for about 74% of total capture fisheries production.
- Finfish represented 85% of total production, with small pelagics as the main group, followed by gadiformes and tuna and tuna-like species.

### Aquaculture

- In 2018, total world aquaculture production reached an all-time high of 114.5 million tonnes (82.1 million tonnes aquaculture fish production, 32.4 million tonnes of aquatic algae and 26,000 tonnes of ornamental seashells and pearls).
- The contribution of world aquaculture to global fish production reached 46% in 2018, up from 25.7% in 2000 compared with 12.7% in 2000.
- In 2018, aquaculture fish production was dominated by finfish (54.3 million tonnes – 47 million tonnes from inland aquaculture and 7.3 million tonnes from marine and coastal aquaculture), molluscs, mainly bivalves (17.7 million tonnes), and crustaceans (9.4 million tonnes).

### World capture fisheries and aquaculture production



## Overall highlights contd

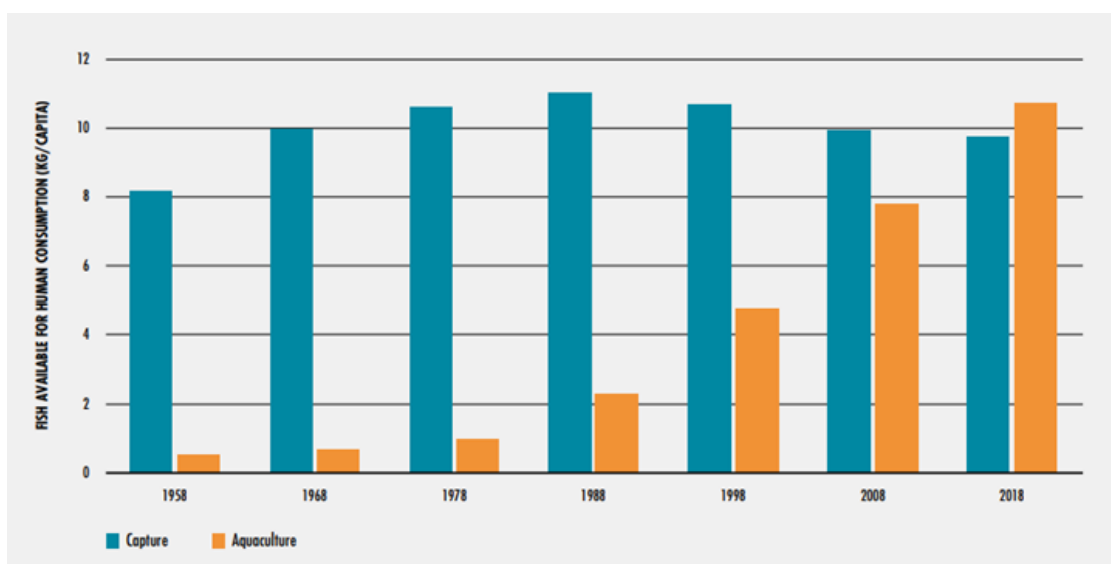
### Consumption

- Global food fish consumption increased at an average annual rate of 3.1% from 1961 to 2017, a rate almost twice that of annual world population growth (1.6%) for the same period, and higher than that of all other animal protein foods (meat, dairy, milk, etc.), which increased by 2.% per year.
- In per capita terms, food fish consumption grew from 9.0 kg (live weight equivalent) in 1961 to 20.5 kg in 2018, at an average rate of about 1.5 percent per year.
- In 2017, fish consumption accounted for 17% of the global population’s intake of animal proteins, and 7% of all proteins consumed.
- Globally, fish provided more than 3.3 billion people with 20% of their average per capita intake of animal proteins and reached 50% or more in some countries.
- Preliminary estimates for 2016 and 2017 point to further growth to about 20.3 and 20.5 kg, respectively.
- The expansion in consumption has been driven not only by increased production, but also by a combination of many other factors, including reduced wastage, better utilisation, improved distribution channels and growing demand, linked with population growth, rising incomes and urbanisation.

### Outlook

- Total fish production (excluding aquatic plants) is expected to expand from 179 million tonnes in 2018 to 204 million tonnes in 2030.
- In absolute terms, the overall increase up to 2030 is 15% (26 million tonnes) over 2018, a slowdown compared with the 7% growth in the period 2007–2018.
- Aquaculture will continue to be the driving force behind the growth in global fish production, extending a decades-old trend.
- Aquaculture production is projected to reach 109 million tonnes in 2030, an increase of 32% (26 million tonnes) over 2018. Yet, the average annual growth rate of aquaculture should slow from 4.6% in 2007–2018 to 2.3% in 2019–2030.
- The share of farmed species in global fishery production (for food and non-food uses), is projected to grow from 46% in 2018 to 53% in 2030.

### Relative contribution of aquaculture and capture fisheries to fish for human consumption

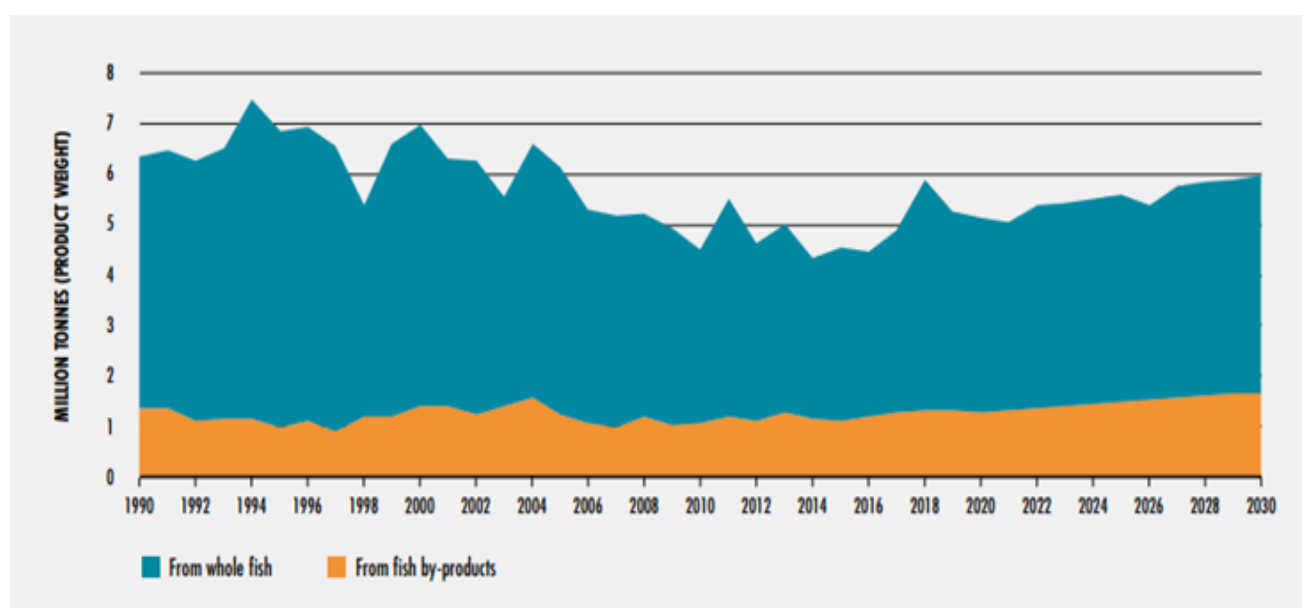


## World fishmeal and fish oil production and use

**A progressive reduction in supply has been coupled with a surging demand driven by a fast-growing aquaculture industry, which increased the prices of fishmeal and fish oil. As a result, a growing share of fishmeal and fish oil is being produced from fish by-products.**

- The amount of fish utilized for reduction to fishmeal and fish oil peaked in 1994 at over 30 million tonnes and then declined to less than 14 million tonnes in 2014. In 2018, it rose to about 18 million tonnes due to increased catches of Peruvian anchoveta.
- In 2018, about 88% (156 million tonnes) of world fish production was utilised for direct human consumption. The remaining 12% (22 million tonnes) was used for non-food purposes, of which 82% (or 18 million tonnes) was used to produce fishmeal and fish oil. The proportion of fish used for direct human consumption has increased significantly from 67% in the 1960s.
- Fishmeal and fish-oil production fluctuate according to changes in the catches of those species, in particular anchoveta, dominated by the El Niño–Southern Oscillation, which affects stock abundance. Over time, the adoption of good management practices and certification schemes has decreased the volumes of unsustainable catches of species targeted for reduction to fishmeal.
- With no major increases in raw material expected to come from whole wild fish (in particular, small pelagics), any increase in fishmeal production will need to come from by-products, with different nutritional value, being lower in protein, but richer in minerals and amino acids in comparison with fishmeal obtained from whole fish.
- A growing share of fishmeal and fish oil, estimated at 25–35%, is produced from the by-products of fish processing, which previously were often discarded or used as direct feed, in silage or in fertilizers. Regional differences do exist. For example, by-product use in Europe was estimated at a comparatively high proportion of 54% of total production.

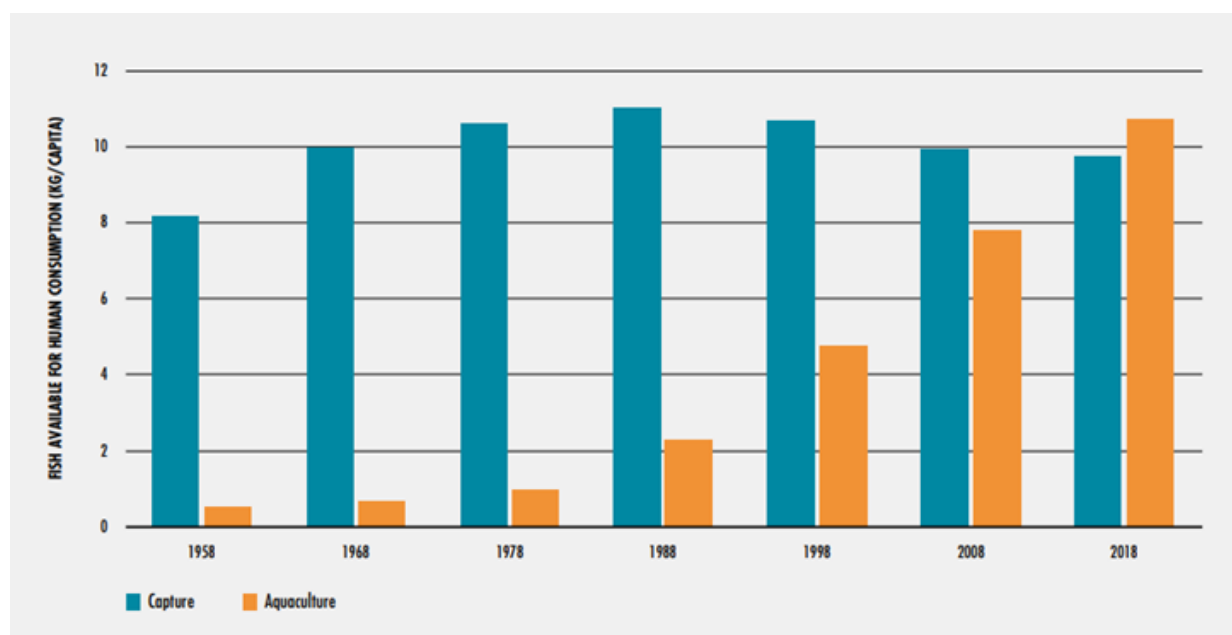
### World fishmeal production 1990 – 2030



## Fishmeal and fish oil use in aquafeeds

Fishmeal and fish oil are still considered the most nutritious and most digestible ingredients for farmed fish, as well as the major source of omega-3 fatty acids (eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]). However, their inclusion rates in compound feeds for aquaculture have shown a clear downward trend, largely as a result of supply and price variation coupled with continuously increasing demand from the aquafeed industry.

### Relative contribution of aquaculture and capture fisheries to fish available for human consumption

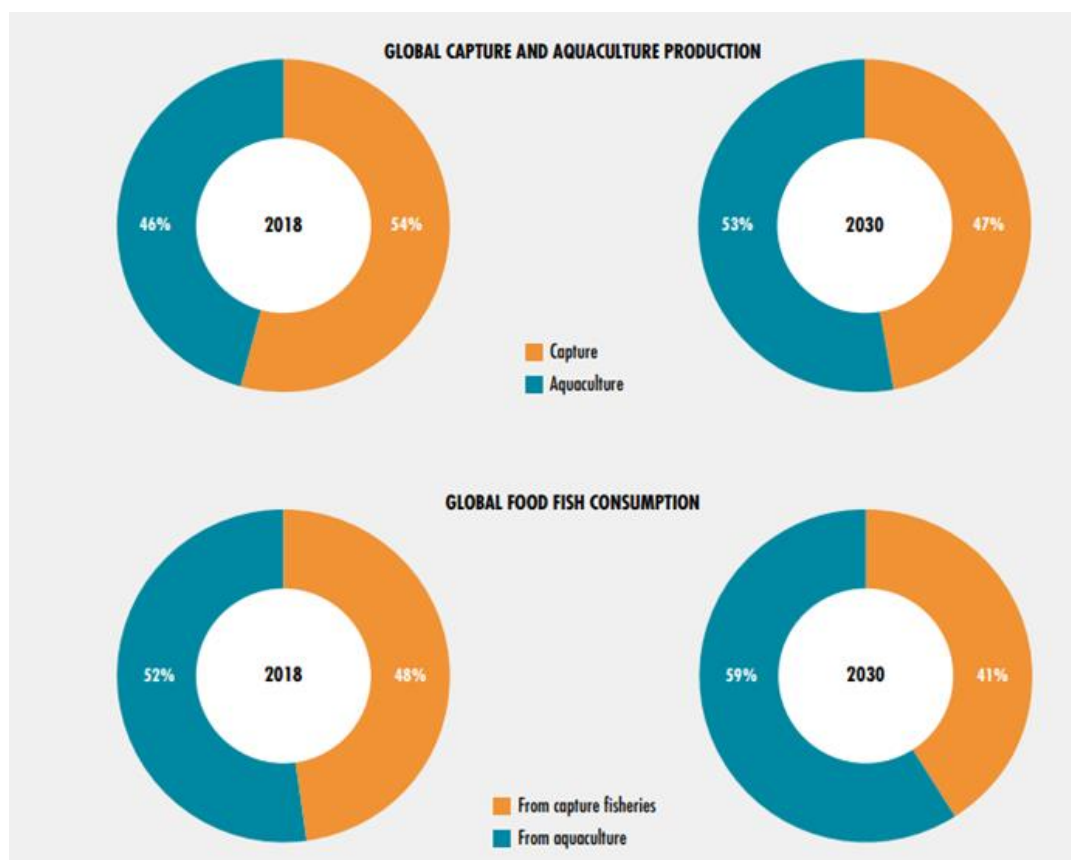


- With regard to direct human consumption, fish oil represents the richest available source of long-chain polyunsaturated fatty acids (PUFAs), which perform a wide range of critical functions for human health. However, the Marine Ingredients Organisation (IFFO) estimates that about 75% of annual fish-oil production still goes into aquaculture feeds.
- Because of the variability of fishmeal and fish-oil production and associated price variations, many researchers are seeking alternative sources of PUFAs. These include stocks of large marine zooplankton, such as Antarctic krill (*Euphausia superba*) and the copepod *Calanus finmarchicus*, although concerns remain over the impacts on marine food webs. Krill oil in particular is marketed as a human nutrient supplement, while krill meal is finding a niche in production of certain aquafeeds.
- Fishmeal and fish oil are increasingly used selectively at specific stages of production, such as for hatchery, broodstock and finishing diets, and the incorporation of fishmeal and fish oil in grower diets is decreasing. For example, their share in grower diets for farmed Atlantic salmon is now often less than 10%.

## Looking ahead to 2030

- The share of capture fisheries production reduced into fishmeal and fish oil should decline slightly in the next decade (18% by 2030 compared with 19% in 2018).
- However, in 2030, the total amount of fishmeal and fish oil produced is expected to be higher than in 2018, by 1% and 7%, respectively, owing to an increased amount of the production being obtained from fish waste and by-products of the processing industry.
- Between 2018 and 2030, the proportion of total fish oil obtained from fish waste is projected to increase from 40% to 45%, while for fishmeal this proportion will grow from 22% to 28%.
- Capture fisheries production is projected to stay at high levels, reaching about 96 million tonnes in 2030, with some fluctuations over the next decade linked to the El Niño phenomenon. This will cause reduced catches in South America, especially for anchoveta, resulting in an overall decrease in world capture fisheries production of about 2% in those years.
- In terms of species, the majority (62%) of global aquaculture production in 2030 will be composed of freshwater species, such as carp and Pangas catfish (including *Pangasius* spp.), as compared with 60% in 2018. Production of higher-value species, such as shrimps, salmon and trout, is also projected to continue to grow. In general, species that require larger proportions of fishmeal and fish oil in their diets are expected to grow more slowly owing to expected higher prices and reduced availability of fishmeal.

### An increasing role for aquaculture



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**the support it needs to thrive.**

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