Seafish Insight:

The global picture – fishmeal production and trends

July 2016

Taken from the UN FAO State of World Fisheries and Aquaculture (SOFIA), 2016. This flagship publication, issued every two years, provides a comprehensive, objective and global view of capture fisheries and aquaculture.

Overall highlights

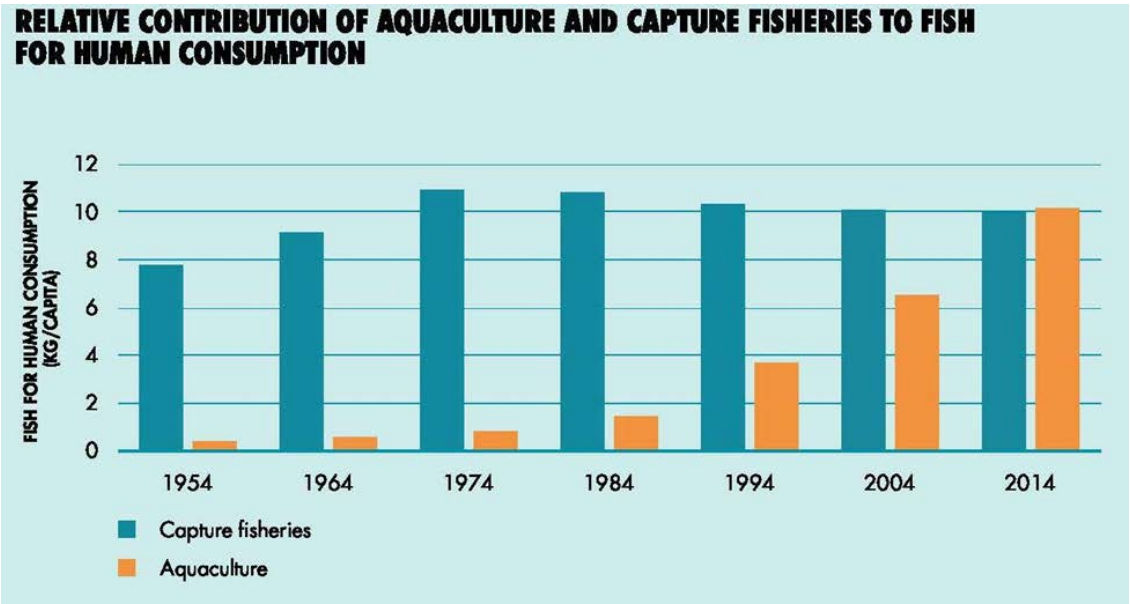
- Global total fisheries production (excluding aquatic plants) reached 167.2 million tonnes in 2014, with 93.4 million tonnes from capture and 73.8 million tonnes from aquaculture. Global total capture fishery production in 2014 was 93.4 million tonnes, of which 81.5 million tonnes was from marine waters (a slight increase on the previous years) and 11.9 million tonnes from inland waters.
- World aquaculture production continues to grow and now provides half of all fish for human consumption. Excluding fish destined for non-food uses, a milestone was reached in 2014 when, for the first time ever, the world's population consumed more farmed fish than wild-caught fish.
- When aquatic plants are included, world aquaculture production reached 101.1 million tonnes in 2014, representing 52% of total fisheries production (195.7 million tonnes).
- The share of commercially assessed fish stocks within biologically sustainable levels was 68.6% in 2013. Thus, 31.4% of fish stocks were overfished. Of the total number of stocks assessed in 2013, fully fished stocks accounted for 58.1% and under fished stocks 10.5%.
- The share of world fish production utilised for direct human consumption has increased significantly in recent decades, up from 67% in the 1960s to 87%, or more than 146 million tonnes, in 2014.
- Growth in the global supply of fish for human consumption has outpaced population growth in the past five decades, with world per capita apparent fish consumption doubling from about 10 kg in the 1960s to 20 kg today.
- In 2013, fish accounted for about 17% of the global population's intake of animal protein and 6.7% of all protein consumed. Fish provided more than 3.1 billion people with almost 20% of their average per capita intake of animal protein.
- In 2014, 84% of the global population engaged in fisheries and aquaculture were in Asia. An estimated 56.6 million people were engaged in the primary sector of capture fisheries and aquaculture in 2014.

Fishmeal is the crude flour obtained after milling and drying fish or fish parts, while fish oil is usually a clear brown/yellow liquid obtained through the pressing of the cooked fish. Many different species are used for fishmeal and fish oil production, with oily fish, especially anchoveta, the main groups of species utilised. A significant, but declining, proportion of world fisheries production is processed into fishmeal and fish oil thereby contributing indirectly to human consumption when they are used as feed in aquaculture and livestock raising.

See: http://www.fao.org/3/a-i5555e.pdf

Fishmeal and fish oil trends

- 21 million tonnes (22.4% of total catches) was destined for non-food products. Of this 21 million tonnes 76% (15.8 million tonnes) was reduced to fishmeal (FM) and fish oil (FO) in 2014, the rest being largely utilised for a variety of purposes including fish for ornamental purposes, culture (fingerlings, fry, etc.), bait, pharmaceutical uses, and as raw material for direct feeding in aquaculture, for livestock and for fur animals.
- This figure of 21 million tonnes has fallen from 34.2 million tonnes in 1994. The reasons for this drop range from the increased use for human consumption and a decrease in dedicated fishing for feed production (due to tighter quota setting and additional controls on unregulated fishing). Another factor is the increased use of fish residues and by-products, increasingly replacing whole fish for FM and FO production.
- FM and FO are still considered the most nutritious and digestible ingredients for farmed fish feeds. To offset their high prices, as feed demand increases, the amount of FM and FO used in compound feeds for aquaculture has shown a clear downward trend, with their being more selectively used as strategic ingredients at lower concentrations and for specific stages of production, particularly hatchery, broodstock and finishing diets.
- Owing to the growing demand for FM and FO, in particular from the aquaculture industry, and coupled with high prices, a growing share of FM is being produced from fish byproducts, which previously were often discarded. In industrial fish processing, 30–70% of the fish ends up as by-products, e.g. heads, viscera and backbones. These by-products are usually further processed into FM and FO, and are primarily used for feed purposes. Non-official estimates of the contribution of by-products and waste, rather than whole fish, to the total volume of FM and FO produced indicate it is now about 25-35% and this figure is expected to grow.
- FM and FO are highly traded products, an important source of revenue for some countries, and a very important feed ingredient for the aquaculture sector, the world's fastest growing food production sector
- There has been much research focused on finding replacements for FM and FO in aquaculture feeds. The amount of FM and FO used in compound feeds for aquaculture has shown a clear downward trend, with their being more selectively used as strategic ingredients at lower levels and for specific stages of production, particularly hatchery, broodstock and finishing diets.
- Increasingly, the utilisation of by-products is becoming an important industry, with a growing focus on their handling in a controlled, safe and hygienic way, thereby also reducing waste.

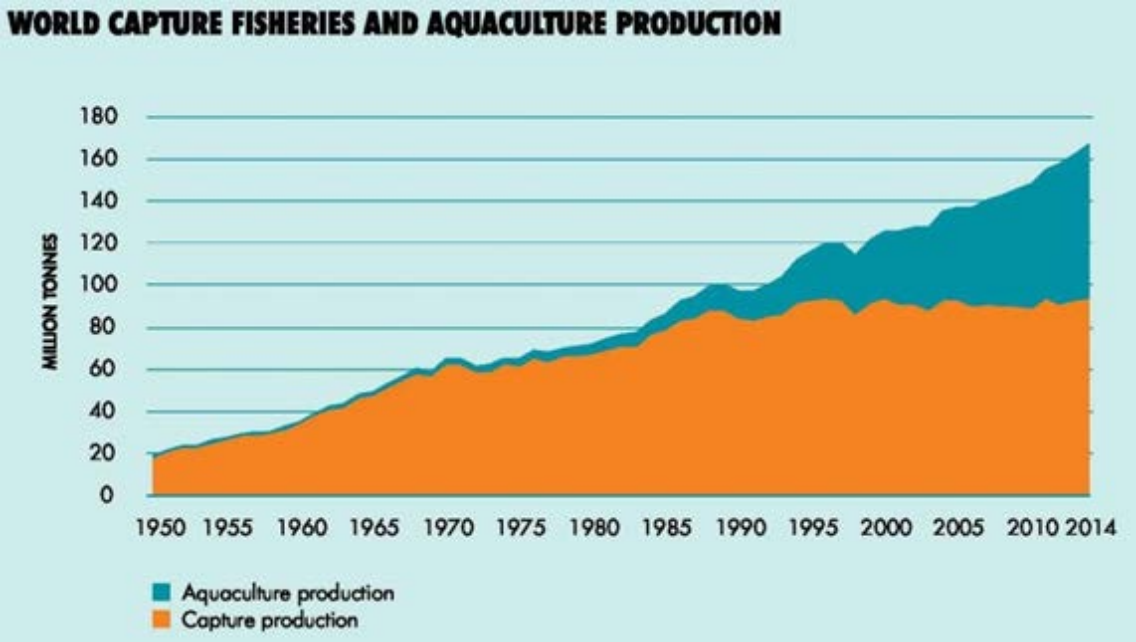


Fishmeal production

- The El Niño phenomenon affects anchoveta catches and stricter management measures have reduced catches of anchoveta and other species usually used for reduction. Hence, FM and FO production fluctuates according to changes in the catches of these species. FM production peaked in 1994 at 30.1 million tonnes (live weight equivalent) and has followed an oscillating and overall declining trend since then.
- In 2014, FM production was 15.8 million tonnes due to reduced catches of anchoveta.
- In 2015, total production was higher compared with 2014, but Chile produced less. In 2015, both Peru and Chile, the main exporters, recorded the lowest export volumes in the past six years. China remained the leading importer of FM with 2015 import volumes at the same levels as 2014.
- FO production is also declining, mainly because of lower production in Latin America, and more stringent quotas on raw materials contributing to price pressure and increased volatility. In 2015, FO production slightly declined compared with 2014, with reduced contributions from Peru and in particular from Chile.
- Owing to the growing demand for FM and FO, in particular from the aquaculture industry, and coupled with high prices, a growing share of FM is being produced from fish by-products, which previously were often discarded. Non-official estimates of the contribution of by-products to the total volume of FM and FO produced indicate it is about 25–35%. With no additional raw material expected to come from whole fish catches (in particular of pelagics), any increase in FM production will need to come from recycling by-products, with, however, a possible impact on its composition.

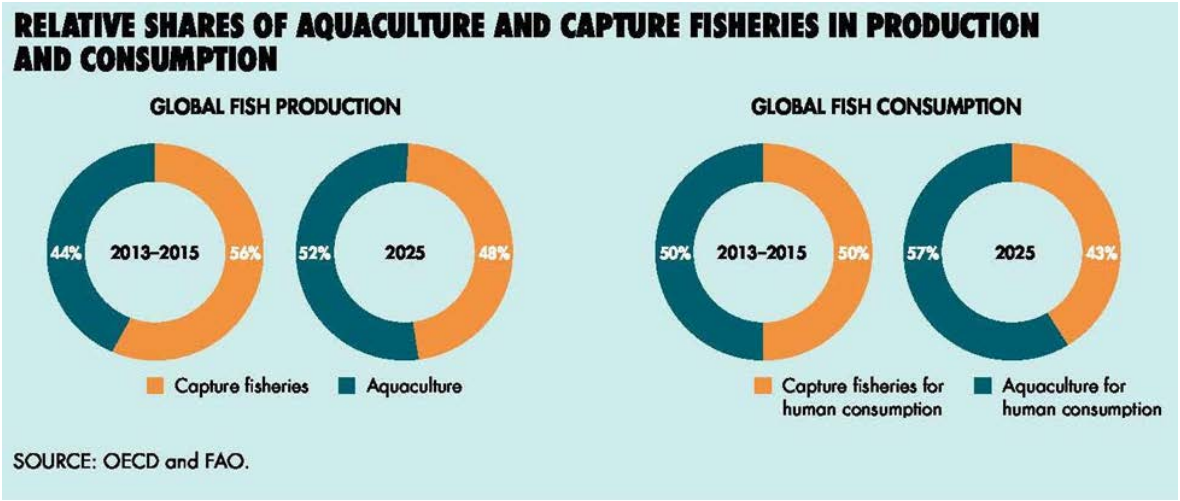
Fishmeal price

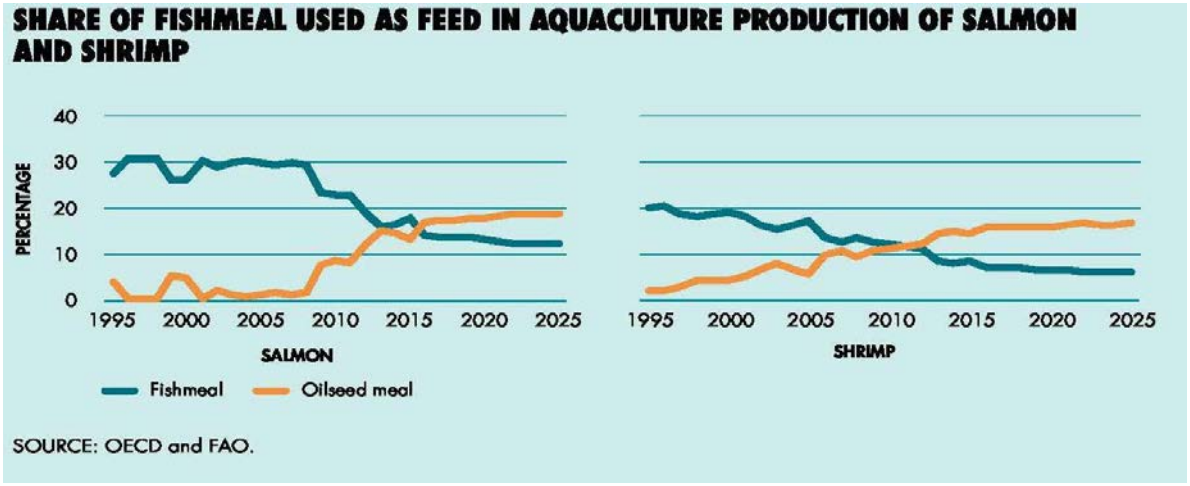
- With annual oscillations mainly caused by El Niño phenomena, FM production has declined gradually since 2005, while overall demand has continued to grow, pushing prices to historic highs through late 2014. Prices then declined until mid-2015 when high expectations for a strong El Niño started to push up prices again. FM prices are expected to remain high in the long term because of sustained demand.
- FO prices peaked in 2014, then decreased until mid-2015 before rising slightly for the rest of the year. Demand for FO is high because it is used as a human nutritional supplement as well as an important ingredient in feeds for selected carnivorous fish species. Due to the steady and growing demand, long-term FO prices are not expected revert to lower levels.



Looking ahead – the projected outlook for aquaculture to 2025 (Page 172)

- Surging demand for fish and fishery products will mainly be met by growth in supply from aquaculture production, which is expected to reach 102 million tonnes by 2025, 39% higher than the base period level.
- Aquaculture will remain one of the fastest-growing sectors for animal food production, although its annual growth rate is estimated to decline from 5.4% in the previous decade to 3.0% in the projection period. This slowdown in expansion will be mainly due to: constraints on the availability and accessibility to water of good quality; competition from alternative uses for optimal production locations; availability of fish seeds and feeds in the requisite quality and quantities; insufficient investments in infrastructure in regions endowed with natural resources for aquaculture production; capital constraints; and challenges in governance and regulatory framework.
- Furthermore, even if slightly declining, the still high costs of fishmeal, fish oil and other feeds will remain a constraining factor (as only about 30% of the species do not need any feed concentrates to grow).
- Developing countries will maintain their key role in aquaculture production, with a share of 95% of total production. They are expected to capture 96% of the additional fish output growth in the projection period. However, aquaculture production should continue to expand also in developed countries (rising 26% in the next decade) and in all continents, with variations across countries and regions in the product range of species and products. Asian countries will remain the main producers, representing 89% of total production in 2025, and with China alone.





Looking ahead – the projected outlook for fishmeal to 2025 (Page 171 – 179)

- The portion of capture fisheries yield used to produce FM will be about 16% by 2025, about 1% less than in the base period. This will be due mainly to the growing demand for human consumption of fish species previously used for reduction, as well as more limited availability of raw material and more fishmeal produced from by-products. The share of capture production reduced into FM and/ or FO will be slightly smaller in El Niño years owing to lower anchoveta catches.
- In 2025, FM and FO production, in product weight, should be 5.1 million tonnes and 1.0 million tonnes, respectively. In that year, FM production will be 15% higher compared with the 2013–15 average, but about 96% of the increase will stem from improved use of fish waste, cuttings and trimmings. As more fish is consumed as fillets or in other prepared and preserved forms, a growing share of its residual production, such as heads, tails, bones and other offal resulting from processing, is expected to be reduced into FM and FO.
- FM produced from fish waste will represent 38% of world FM production in 2025, compared with 29% for the 2013–15 average level. The use of fish by-products can affect the composition and quality of the resulting FM and/or FO with, in general, less protein, more ash (minerals) and increased levels of small amino acids (such as glycine, proline, hydroxyproline) compared with those obtained from whole fish. This difference in composition may hinder increased use of FM and/or FO in feeds used in aquaculture and livestock farming. However, the fish model and its projections do not take these changes into consideration.
- FM prices increased significantly from 2006 to 2013, peaking at US$1 747 per tonne in 2013. Since then, there has been a slight decline, but prices have remained high. By 2025, the average FM price is expected to be 14% lower in nominal terms and 30% lower in real terms compared with the base period. The only exceptions will be in El Niño years due to reduced catches in South America, in particular for anchoveta, which is mainly used for reduction into FM and FO. Starting from very high levels, FO prices are expected to decline in the period 2016–2025, but still remain higher than FM prices. The average FO price is projected to decline by 3% in nominal terms, and by 21% in real terms, between the base period and 2025.
- Consumption of FM and FO will remain characterised by the traditional competition between aquaculture and livestock for FM, and between aquaculture and dietary supplements for direct human consumption for FO, but will be constrained by the rather stable production. Due to still high prices and major innovation efforts, it is expected that the percentage of FM and FO in compound feeds in aquaculture will continue its downward trend, and FM and FO will be more frequently used as strategic ingredients to enhance growth at specific stages of fish production. Being rich in omega-3 fatty acids, FO is expected to be increasingly processed for direct human use as it is considered beneficial for a wide range of biological functions.

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

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