

FISH AND SEAFOOD

Market situation

During 2015, the global fishery and aquaculture sector showed sustained growth in overall production and consumption. In 2014, aquaculture's contribution to total fish supplied for food overtook that of wild fish for the first time and this trend continued in 2015. In the same year, after a period of continuous expansion, trade of fish and fishery products declined in value terms. This slowdown was caused by economic contractions in key markets, exchange rate developments and lower fish prices. China, the leading producer, processor and exporter, and the third largest importer of fish and fishery products entered a period of serious uncertainty, even reducing its fish exports due to a slowdown in its processing sector. Seafood consumption in the Russian Federation suffered from the effects of its continuing trade embargo on fish from certain countries. Norway had record total export values, while in Thailand and other large shrimp supplying countries lower shrimp prices pushed total export values down significantly. Catches of anchoveta (mainly used to produce fishmeal and fish oil) were better than expected, relieving some short-term pressure on fishmeal and fish oil prices.

Prices of wild species increased more than those of farmed seafood in 2015, as measured by the FAO Fish Price Index (base 2002-04 = 100). Since reaching a peak in March 2014, with the index at 164, overall fish prices have shown a decreasing trend, with the index falling to 135 in July 2015 due to reduced consumer demand in key markets and an increased supply in certain fishery species. During the end of 2015 and early 2016, prices started to slightly recover.

Projection highlights

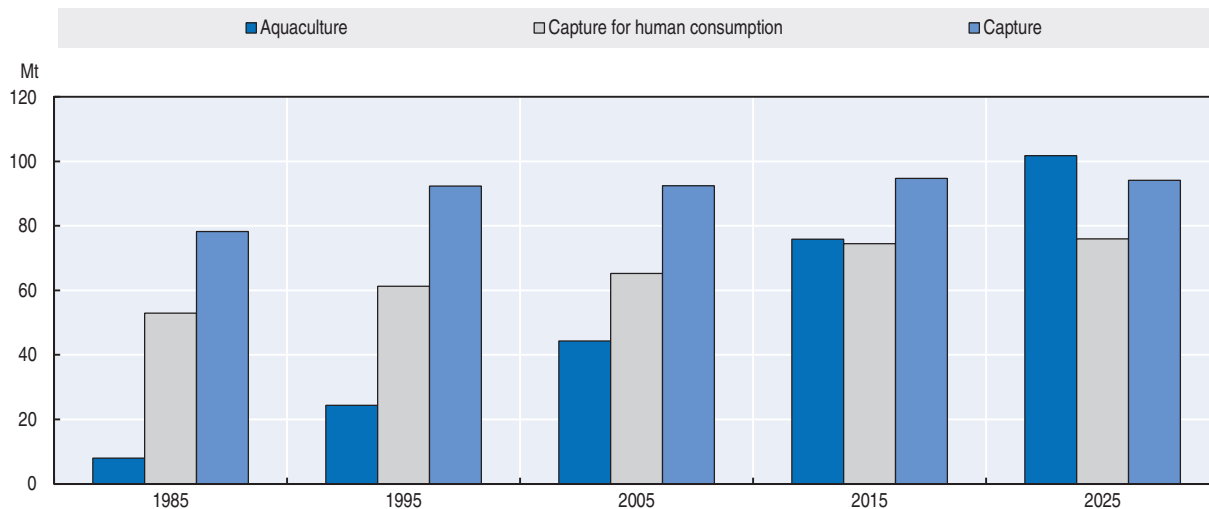
The outlook for the fish sector remains largely positive. In nominal terms, average fish prices are all expected to decline in the first part of the projection period before recovering in the last five years of the outlook period. In 2025, average producer prices are projected to be slightly higher than during the 2013-15 base period, as demand growth is expected to outpace supply. However, the average prices for traded products for human consumption, fishmeal and fish oil are projected to be slightly lower in 2025 relative to the base period. In real terms, however, all prices are expected to decrease over the next decade from the record highs attained in 2014.

World fish production is projected to grow at 1.5% p.a. during the outlook period, a slowdown relative to the 2.5% p.a. of the previous decade. Production is expected to reach 196 Mt, with an overall increase of 29 Mt, or 17%, between the base period and 2025. Most of the production growth for fish will take place in developing countries and in particular in Asia. As capture fisheries production is expected to increase by only 1%, by 2025, the majority of growth will come from aquaculture, which will surpass total capture fisheries in 2021 (Figure 3.6). Despite the increasing role of aquaculture in total fish supply, the capture sector is expected to remain dominant for a number of species and vital for domestic and international food security.

Aquaculture will continue to be one of the fastest growing food sectors despite its average annual growth rate slowing from 5.4% p.a. in the previous decade to 3.0% p.a. in the


period 2016-25. This deceleration is due to higher costs, combined with competition for land, water and labour from alternative production systems. Much of the increase is expected in freshwater species.

Figure 3.6. **Aquaculture production and capture fisheries**



Note: "Capture for human consumption refers" to the Capture production excluding ornamental fish, fish destined to the production of fishmeal, fish oil and other non-food uses. All aquaculture production is assumed to be destined to human consumption.

Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-data-en>.

StatLink  <http://dx.doi.org/10.1787/888933381641>

World production of fishmeal is expected to increase by 15% in 2025 relative to the average 2013-15 level to reach 5.1 Mt, while fish oil should grow by 17% to 1 Mt during the same period. Approximately 38% of fishmeal in 2025 will be obtained from fish by-products.

World fish consumption as food is projected to increase by 21% (or 31 Mt live weight (lw)) in 2025 compared to the base period, growing at 1.8% p.a. in the next decade compared to 3.1% p.a. in the previous one. In 2025, fish originating from aquaculture is expected to represent 57% of the fish consumed. Fish consumption will continue to expand more strongly in developing countries than developed countries, where there is an overall slowdown in consumption growth. Per capita fish consumption is expected to increase in all continents, while the fastest growth rates are projected for Oceania and Asia.

Fish and fishery products (fish for human consumption, fishmeal) will continue to be highly traded with about 36% of total fishery production (31% excluding intra-EU trade) expected to be exported in 2025. Trade of fish for human consumption is projected to increase by 18% (or 7 Mt lw) by 2025. However, its annual rate of growth is projected to decline from 2.3% p.a. during the last decade to 1.9% p.a. over the next decade reflecting the slowdown in production and demand. Developing countries will continue to be the main exporters of fish for human consumption, but their share in world exports will decrease from 67% in 2013-15 to 66% in 2025. During the same period, developed countries will reduce their share in world imports from 54% to 53%.

A number of uncertainties and challenges can affect projections for fish. The outlook for capture fisheries, fishmeal and fish oil depend on the natural productivity of fish stocks

and ecosystems, which is uncertain, as well as on variable weather patterns. For aquaculture, relevant factors are the accessibility and availability of sites and water resources as well as to technology and finance; the sustainability, availability and cost of fish seeds (e.g. eggs, spawn, offspring, fry, larvae) and feeds; antibiotic use; assessment of environmental impacts (including pollution, fish diseases and escapees); and food safety and traceability issues. Furthermore, trade policies, trade agreements and market access remain important factors influencing the overall dynamics of world fish markets.

The expanded fish and seafood chapter is available at

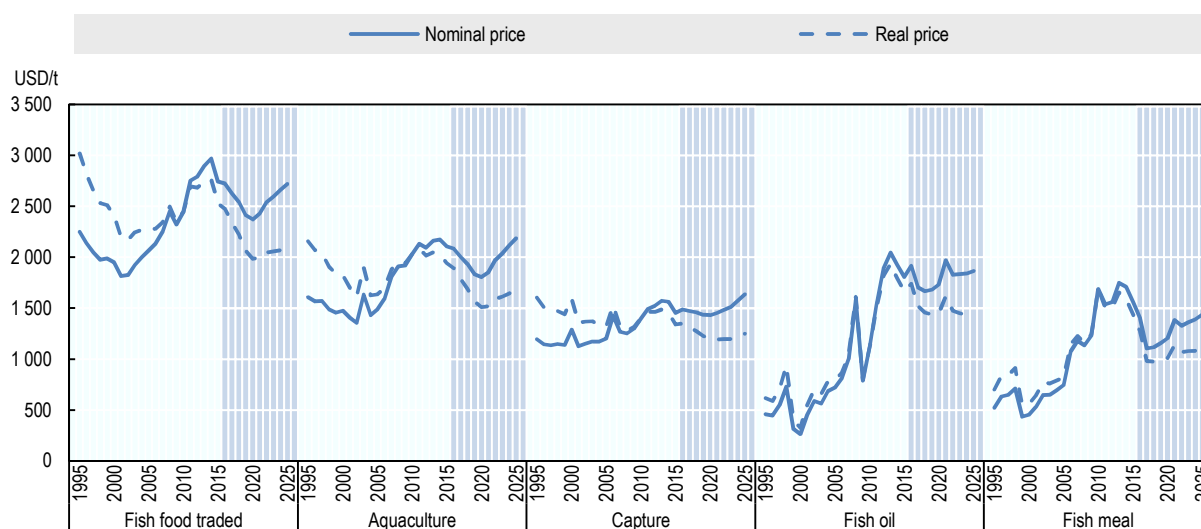
http://dx.doi.org/10.1787/agr_outlook-2016-12-en

FISH AND SEAFOOD

Prices

Fish¹ prices start with lower levels in 2015 compared to the peaks recorded in 2014. In the short term, slower economic growth, sluggish demand in some key markets, and lower input costs are expected to cause prices to decrease further. However, in the medium term, prices are expected to subsequently stabilise and grow slightly, and then remain on an elevated plateau by the end of the decade. Yet all prices will trend moderately downward when measured in real terms (Figure 3.6.1). The average fish prices for aquaculture, capture, and traded products for human consumption in real terms will eventually fall below the low levels recorded in 2000, while the price of fishmeal and fish oil will remain well above the levels of 2000 due to a shortage of these products on the market.

Figure 3.6.1. World fish prices



Note: Fish food traded: world unit value of trade (sum of exports and imports) of fish for human consumption. Aquaculture: FAO world unit value of aquaculture fisheries production (live weight basis). Capture: FAO estimated value of world ex-vessel value of capture fisheries production excluding for reduction. Fishmeal: 64-65% protein, Hamburg, Germany. Fish oil: any origin, N.W. Europe.

Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <http://dx.doi.org/10.1787/888933381956>

On the demand side, the main drivers affecting world fish prices for capture, aquaculture and traded products will be income, population growth and meat prices; on the supply side, the main factors will be rather stable capture fisheries production and costs for feed, energy and crude oil. The average price for fish caught in the wild (excluding fish for reduction) is expected to increase more than that for farmed fish. In 2025, capture and aquaculture fish prices will be 7% and 2% higher compared to the 2013-15 base period, with an average annual growth of 1.0% p.a. and 0.8%

p.a. over the projection period. In real terms, both capture and aquaculture prices are expected to decline by respectively 13% and 17% by 2025 compared to 2013-15.

Demand will be the main factor behind the more sustained increase in the average price for capture fisheries, although this price will continue to be lower than that for farmed fish due in part to the large share of lower value fish in overall catches. The limited increase of the average aquaculture prices is also due to the decline of feed prices from the high levels recorded in 2011-12 as well as better feed conversion ratios and continued productivity gains (although at a slower pace than in previous decades). Coarse grains, other lower protein feed, and fishmeal will continue to be used as ingredients for raising aquaculture species that require feed. The price ratio between aquaculture and maize is expected to fluctuate inside a narrow band over the next decade, at a higher level than during the 2006-12 period, but much lower than before 2006. The price ratio between fish raised in aquaculture to fishmeal will eventually stabilise over the projected period at much lower levels than before 2006.

Fishmeal prices increased significantly from 2006 to 2013, peaking at USD 1747/t in 2013. Since then, there has been a slight decline, but prices remained high. The average fishmeal price is projected to decrease during the projection period; in 2025 it is expected to be 14% lower in nominal terms and 30% in real terms as compared to the base period. The only exceptions will be in the years when *El Niño* occurs;² this disturbance of normal weather patterns affects catches in South America in particular, especially the anchoveta species which is usually reduced into fishmeal and fish oil. The price ratio between fishmeal and oilseed meal is expected to increase due to a strong preference for fishmeal at certain stages of animal rearing, in particular for some species raised in aquaculture. This difference in price ratio will be accentuated in *El Niño* years as fishmeal supplies will become very limited.

Since fish oil prices are starting from very high levels, a 3% decline in nominal terms and 21% in real terms is expected by 2025 compared to the 2013-15 period. The popularity of the Omega-3 fatty acids in human diets and the growth in aquaculture production have contributed to an increase in the fish to vegetable oil price ratio since 2012. It is assumed this high ratio will be maintained over the medium-term and magnified in years when *El Niño* occurs.

The average price of traded fish products for human consumption is also expected to decline during the outlook period, with a 5% decrease in nominal terms and 23% in real terms in 2025 compared to 2013-15. The main drivers for this decline will be the competitive prices of substitutes, in particular chicken, the slowdown in demand from key markets due to sluggish economic growth, and the reduced production and marketing costs of aquaculture products due to lower transport and feed costs.

Production

Global fish production (capture + aquaculture) increased by 24% between 2006 and 2015. Over the course of the outlook period, global fish production will continue to expand, driven by technological improvements and sustained demand for fish, but at a slower rate compared to the previous decade. In absolute terms, the overall increase is projected to be approximately 29 Mt by 2025, 9 Mt less than over the past decade. Fish supplies in many regions will be affected by resource availability, regulations (environmental and food safety), and technological improvements. The relatively greater abundance and accessibility of natural resources in developing countries means they are expected to account for most of the projected growth in production and that their share of total production will increase from 83% in the base period to 85% in 2025. Regional differences in fish production are expected to persist. A more marked expansion is expected in Asia, with its share of total fish production going up from 70% in 2013-15 to 73% in 2025. China is projected to strengthen its leading role, increasing its share from an average of 37% over 2013-15 to 40% in 2025.

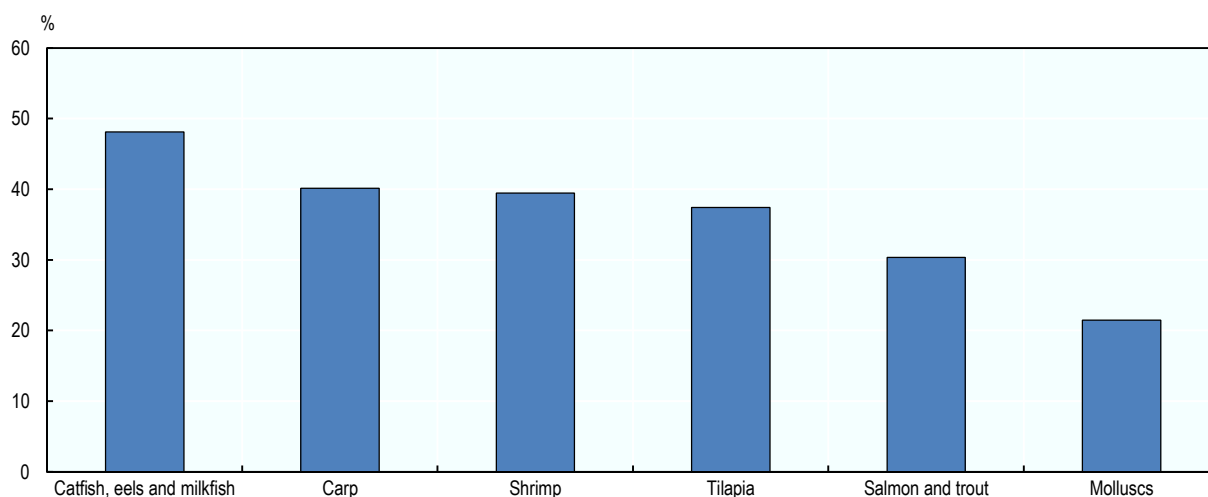
World capture fisheries production is not expected to increase by much at the beginning of the outlook period due to the effects of *El Niño* and the severe quotas being applied to catches for some species. It is projected to grow by just 1% by 2025 relative to 2013-15, although *El Niño* events are expected to cause a 2% reduction in production in the years they occur. This 1% increase, although limited, should be possible due to improved catches in some fishing areas where stocks of certain species are recovering, as well as from reduced onboard waste and discards.

Despite a slowdown in its annual growth rate (5.4% p.a. in 2006-15 vs 3.0% p.a. in 2016-25), aquaculture will be the main driver of growth in seafood production. Aquaculture production is expected to be 39% higher in 2025, relative to the base period, reaching 102 Mt. The anticipated slowdown in growth will mainly be due to restrictions caused by the scarcity of suitable locations due to competition from other users of water and coastal spaces, capital constraints, governance challenges, and regulatory framework. Furthermore, even if decreasing over the outlook period, the continued high costs of fishmeal, fish oil and other related feeds will serve as a drag on growth as they are a crucial component of production for many species, in particular carnivorous ones. Growing from a share of 44% in the base year, aquaculture will overtake capture fisheries in 2021 and reach 52% of total fish production in 2025.

Overall, freshwater species, such as carp, catfish (including *Pangasius*) and tilapia, will account for most of the increase in aquaculture production and represent around 60% of total aquaculture production in 2025. Production of higher value species, such as shrimps, salmon and trout, is also projected to continue to grow in the next decade (Figure 3.6.2).

Figure 3.6.2. Growth in world aquaculture production by species

2025 vs 2013-15



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

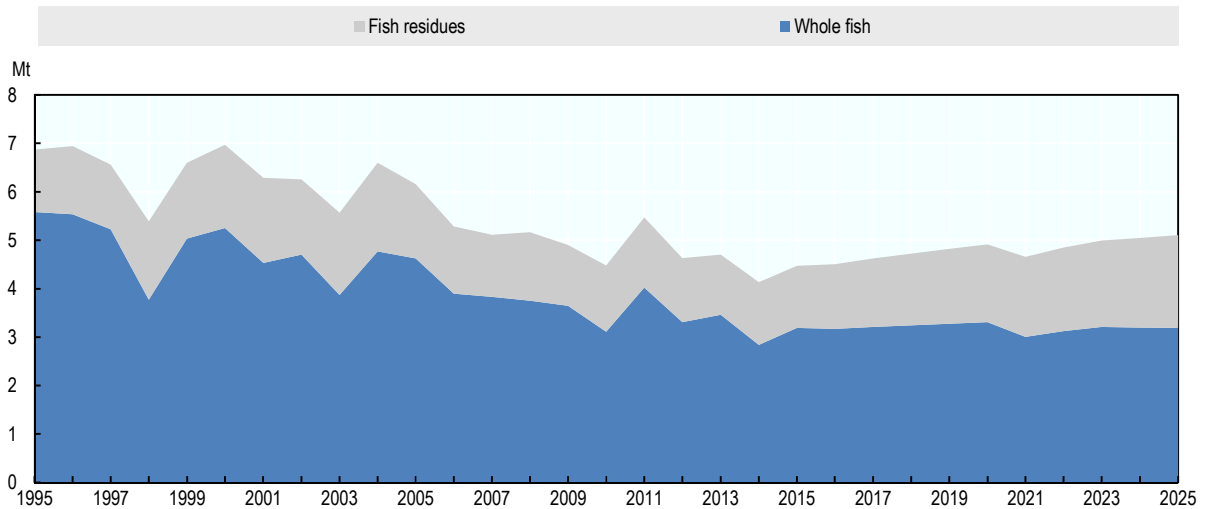
StatLink  <http://dx.doi.org/10.1787/888933381960>

Developing countries will consolidate their position as lead aquaculture producers, with a share of almost 95% of global aquaculture production and account for 96% of the additional aquaculture output. Their production will increase by 40% in 2025 relative to the base period. Aquaculture will also show an impressive increase in developed countries, growing 26% during the same period, and expand by 40% in Latin America and the Caribbean, 39% in Asia, 35% in Africa, 30% in Oceania, 28% in Europe, and 23% in North America between the base period and 2025. The bulk of aquaculture production will continue to originate from Asian countries, which will account for 89% of total production in 2025. China will remain the dominant producer, accounting for 62% of total production. China, India, Indonesia, and Viet Nam are expected to represent the majority of growth in terms of quantity. In percentage terms, a significant expansion is projected for Brazil, Ghana, Nigeria, Bangladesh, Colombia, Mexico, and Norway.

The share of total fish production destined for direct human consumption is projected to increase from 88% of the average over 2013-15 to 91%, or 178 Mt, by 2025. Most of the remaining 18 Mt is expected to be reduced to fishmeal and fish oil, contributing indirectly to human consumption when they are used as feed in aquaculture and livestock breeding. Despite the decline in the proportion of world capture fisheries production not destined for human

consumption, the overall production of fishmeal and fish oil (in product weight) is projected to increase in 2025 by 15% and 17%, respectively, compared to the averages of 2013-15. Due to limited raw material, the most of the increase in fishmeal and fish oil production (96% and 74% respectively) will come from recycling by-products resulting from fish processing into fillets and other products. In 2025, fishmeal obtained from by-products is expected to account for 38% of total fishmeal production by 2025, up from 29% in 2013-15 (Figure 3.6.3). During the same period, the share for fish oil could reach 43% of total production, compared with 38% in 2013-15.

Figure 3.6.3. Fishmeal production by source



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <http://dx.doi.org/10.1787/888933381970>

Consumption

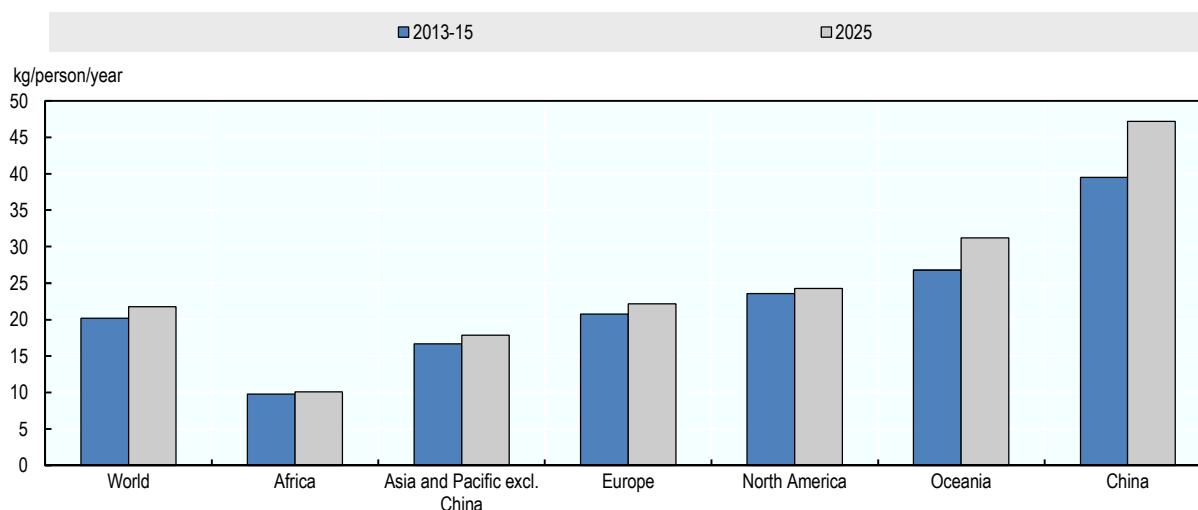
Demand for fish and fishery products is expected to increase during next decade. Fish is a heterogeneous commodity, and differences in demand can be influenced by attributes such as species, production areas, methods of fishing or farming, handling practices and hygiene. Being a highly perishable commodity, fish needs to be correctly treated after harvesting. Continuous innovation and improvements in post-harvest methods, processing, transportation, distribution, marketing, and food science and technology will continue to facilitate and expand the commercialisation and consumption of an expanded variety of species and products. Further expansion in the availability of fish and species consumed will mainly originate from aquaculture production, which will continue to push the demand for, and consumption of, species that have shifted from being primarily wild-caught to being primarily aquaculture-produced. This will be associated with a decrease in price and a strong increase in commercialisation and consumption of species such as shrimps, salmon, bivalves, tilapia and catfish (including *Pangasius*).

Of the 178 Mt available for human consumption in 2025, the lowest quantities will be consumed in Oceania and Latin America. Asia will consume more than two-thirds of the total: 127 Mt, of which 60 Mt outside China. Asia is also expected to continue to dominate growth in consumption, accounting for 73% of the additional fish consumed by 2025.

In per capita terms, world apparent³ fish food consumption is expected to increase over the next decade, reaching 21.8 kg in 2025, up from an average of 20.2 kg in 2013-15. The growth rate will be lower in the second half of the outlook period when fish prices will increase. Overall, per capita apparent fish food consumption will increase by 0.8% p.a. during 2016-25, compared to 1.9% p.a. during 2006-15.

Apparent per capita fish consumption will expand on all continents (Figure 3.6.4), with greater increases expected in Asia and Oceania. The contribution of fish to nutritional intake will continue to vary considerably between and within countries and regions in terms of quantity and variety consumed per capita. For example, the most substantial increases will occur in Brazil (+33%), Saudi Arabia (+23), other Eastern European countries (+37%), and China (+19%). Apparent fish consumption will remain static or decreasing in a few countries, including Argentina (-16%), Russian Federation (-5%), Canada (-3%) and in Japan (-2%).

Figure 3.6.4. Per capita fish consumption



Note: data are expressed in live-weight equivalent.

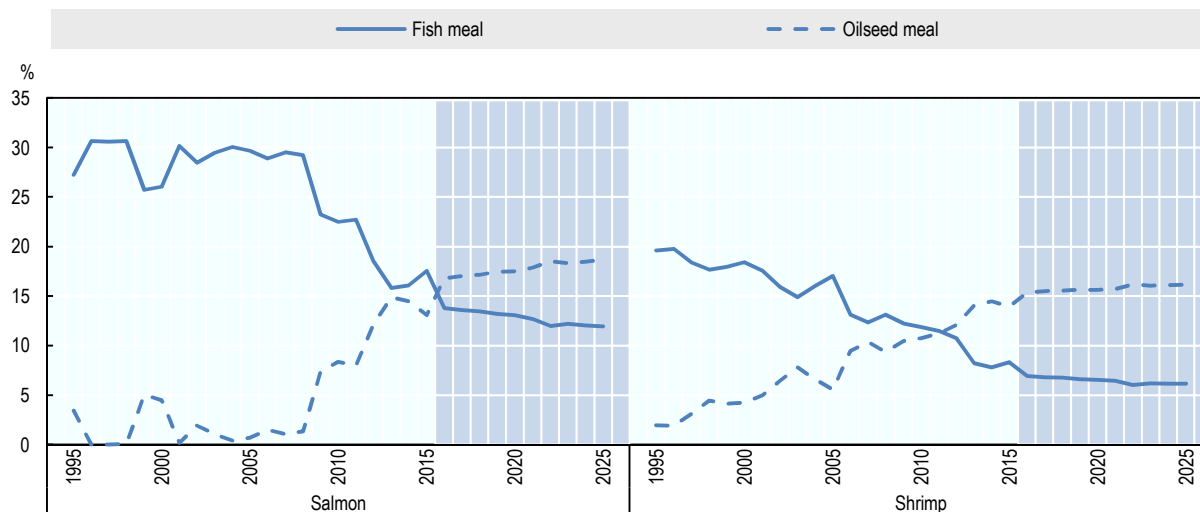
Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <http://dx.doi.org/10.1787/888933381983>

Disparities in fish consumption exist between the more and less developed countries. Although over the next decade, annual apparent per capita consumption of fishery products is expected to increase more markedly in developing regions (+10%) compared with developed countries (+3%), it will remain lower than that in more developed regions (21.5 kg vs 23.4 kg in 2025), but the gap is narrowing. However, if SSA is excluded, per capita fish consumption in 2025 in developing countries (24.3 kg) will be higher than consumption in developed countries. Overall, a sizeable and growing share of fish consumed in developed countries will consist of imports, owing to steady demand and declining domestic fishery production. The limited expansion of per capita apparent consumption in developed countries reflects ageing populations, already high rates of per capita consumption, slowing population growth and dietary shifts that are already underway.

Consumption of fishmeal and fish oil is characterised by the competition between aquaculture and livestock for fishmeal, and between aquaculture and dietary supplements for direct human consumption for fish oil, but will be constrained by the rather stable and limited production. The amount of fishmeal and fish oil in aquaculture feeds are expected to continue their downward trend due to high prices and major innovation efforts (Figure 3.6.5), and fishmeal and fish oil will be more frequently used as strategic ingredients to enhance growth at specific stages of fish production. Fish oil is still expected to be used in the aquaculture industry, but will also be increasingly processed for direct human consumption as it usually obtains a better price in this market.

Figure 3.6.5. Share of fishmeal consumption by type of aquaculture



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <http://dx.doi.org/10.1787/888933381990>

Trade

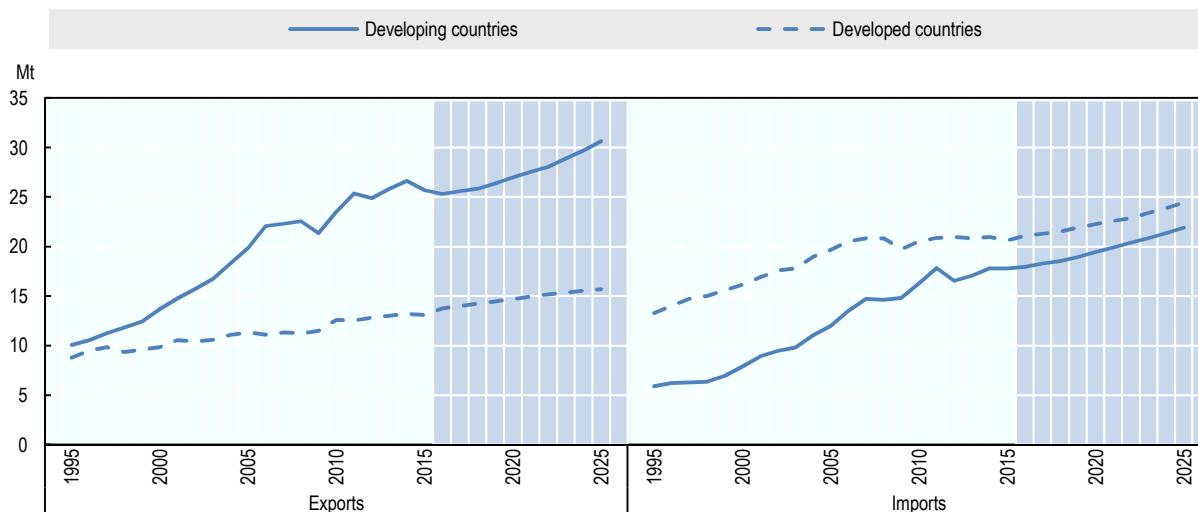
Trade in fish and fishery products will continue to expand during next decade, fuelled by expanding fishery production and high demand. As a consequence, the fisheries sector will continue to operate in an increasingly globalised environment and outsourcing of processing will rise: fish can be produced in one country, processed in a second, and consumed in a third.

World trade of fish for human consumption is expected to reach more than 46 Mt in 2025, up 18% from the base period but lower with respect to the 32% increase experienced during the previous decade (2006-15). This decline will be caused by slower expansion of fishery production, high prices, and sustained domestic demand in some of the major exporting countries. Aquaculture will contribute to a growing share of the international trade in fishery commodities for human consumption.

The next decade will be characterised by the major role played by developing countries in fishery trade (Figure 3.6.6). They will account for 66% of exports and 47% of imports of fish and fishery products for human consumption in quantity terms by 2025. However, it is important to highlight that the picture will be different when considering value. Developed countries are expected to continue to account for a greater proportion of world trade in terms of value (between 60-70%) given that they import species of higher value. In addition, in view of their stagnating domestic fishery production, these same countries will rely on imports to cover their increasing domestic consumption of fish and fishery products.

Due to their primary role in fishery production, 53% of world fish exports for human consumption will originate from Asia in 2025, an increase compared to the 50% share in the the base period. Asian countries will be responsible for 63% of the overall growth of world fish exports for human consumption. China will further strengthen its role as major global exporter increasing its share in global exports of fish for human consumption from an average of 20% in 2013-15 to 24% in 2025. It is expected that Chinese exports will continue to be composed by goods produced from domestic and imported raw material. During the next decade, major growth in exports is also expected from Viet Nam (+38%), Peru (+35%), Japan (+35%), the United States (+33%) and Norway (+26%).

Figure 3.6.6. Trade of fish for human consumption



Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

StatLink  <http://dx.doi.org/10.1787/888933382002>

OECD countries will continue to be the leading importers of fish for human consumption accounting for 53% of world imports and be responsible for 50% of the overall growth of world imports by 2025. The European Union will represent the largest single market with a share of 20%, followed by the United States (14%) and Japan (8%). Their imports are all expected to increase over the next decade (+17%, 30%, and 5% respectively). To satisfy the growing demand for fish, Africa is expected to become further dependent on fish imports, with an overall increase of 41%, at 3.4% p.a. Increasing imports are also expected to be recorded by several Asian countries (including Bangladesh, the Philippines, Korea, and Viet Nam), Brazil, selected countries in the Middle East, and in Africa

Exports of fishmeal are projected to increase by 15% relative to 2013-15 and reach 3.0 Mt (product weight) by 2025. Developing countries will remain the main exporters and importers of fishmeal, with a share of 67% of both world imports and exports. China is expected to have a 40% share of world fishmeal imports by 2025, increasing from 36% in 2013-15, to satisfy the needs of its aquaculture and pig industries. Peru will continue to be the leading exporter of fishmeal, followed by the United States, Chile, and Thailand. Fish oil exports are expected to increase by 9% over the next decade, with developing countries exporting 54% of the total. Salmon farming in several OECD countries and the growing demand for fish oil to be consumed as food means OECD countries will be the main importers of fish oil, 80% of global fish oil imports. Norway will account for 31% of world fish oil imports in 2025.

Main issues and uncertainties

Many factors can affect the fish projections reported here. With the exception of the impact of *El Niño*, and which has been taken into account by the fish model, this *Outlook* assumes normal weather conditions from 2016 onwards. However, climate change, variability, and extreme weather events compound threats to the sustainability of capture fisheries and aquaculture development in marine and freshwater environments.⁴ Impacts occur as a result of both gradual atmospheric warming and associated physical and chemical changes of the aquatic environment.⁵ This could lead to warming water temperatures, changing ocean currents, rise in sea levels, changes in rainfall patterns, river flows, lake levels, and ocean acidification. These, in turn, would lead to changes in the quantity and composition of the catch, as well as the distribution of fish. Furthermore, extreme weather events and sea level rises could impact fisheries-related

infrastructure, such as ports and fleets, further raising the costs of fishing, processing, and distribution activities.

During next decade, capture fisheries production is projected to remain stable. Yet, the effective prospects of capture fisheries are difficult to determine given the many variables and uncertainties. The overcapacity of fishing fleets globally and Illegal Unreported and Unregulated (IUU) fishing are also important threats that affect the sustainability of fisheries resources. It is estimated that IUU activities subtract from the global economy up to 26 Mt of fish, valued at USD 23 billion, annually. Several states have acted to develop and implement national plans of action against IUU. However, there is worldwide consensus that the coming into force and implementation of the 2009 FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA)⁶ will be an important milestone in the fight against IUU fishing. The main objective of the PSMA is to prevent, vessels engaged in IUU fishing from using ports to land their catches, thereby reducing the incentive of such vessels to continue to operate as well as blocking fishery products derived from IUU fishing from reaching national and international markets. The Agreement will enter into force after the deposit of the 25th instrument of adherence to the Agreement. As of March 2016, 24 FAO Members have become party to the PSMA, and more are expected to conclude their internal processes to ratify, accede, accept or approve the PSMA in the near future.

Owing to better resource management practices, some fisheries and stocks are showing signs of recovery, which could help maintain and stabilise overall capture fishery production through compensation between increases of catches in some fisheries and areas, and decreases in others. However, in order to obtain these results, effective fisheries management policies should be implemented.

In this respect, it is important to mention the FAO Blue Growth Initiative (BGI), which is a coherent framework for the sustainable and socioeconomic management of living aquatic resources. The BGI is designed around sustainable capture fisheries and aquaculture, livelihoods and food systems, and economic growth from aquatic ecosystem services. It brings support and more attention to enhance the implementation of the FAO Code of Conduct for Responsible Fisheries and the ecosystem approach to fisheries and aquaculture. It also reflects the objectives of Sustainable Development Goal (SDG) 14 “Conserve and sustainably use the oceans, seas and marine resources”⁷ and other SDGs. The BGI especially targets the many vulnerable coastal and fisheries-dependent communities where ecosystems are already under stress from pollution, habitat degradation, overfishing and harmful practices.

It is expected that future growth in fish production will originate from aquaculture. However, many factors might affect the prospects for this sector, including land and water and associated conflicts, feed, seed⁸ supply and genetic resources, environmental integrity and disease problems, development and adoption of new and improved farming technologies, market, trade and food safety, climate change and investment capital impediments and problems that can originate from unmonitored aquaculture practices. It is expected that aquaculture will continue to grow through intensification, species diversification, expansion into new milieus, including moving further into offshore marine waters, and through the introduction of innovative, more resource-efficient farming technologies.

In addition to issues related to production, many factors can have an impact on the commercialisation of fish and fishery products and prices. These include international trade rules and tariffs, quality and safety, technical standards and labelling, certifications for biological sustainability, as well as social and labour conditions within the industry and its suppliers.

Notes

1. The terms “fish” and “fish and seafood” indicate fish, crustaceans, molluscs and other aquatic invertebrates, but excludes aquatic mammals and aquatic plants. All quantities are expressed in live weight equivalent, except those of fishmeal and fish oil.
2. Set in the model at the beginning of the *Outlook* and in 2021.
3. The term “apparent” refers to the average food available for consumption, which for a number of reasons (for example, waste at the household level) is not equal to average food intake or average food consumption.
4. FAO (2016). *Climate change and food security: risks and responses*.
5. IPCC. 2013. *Climate change 2013: the physical science basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. T.F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley, eds. Cambridge, UK, and New York, Cambridge University Press. 1535 p.
6. More information on PSMA is available at www.fao.org/fishery/psm/agreement/en
7. UN (2015) Goal 14: Conserve and sustainably use the oceans, seas and marine resources. www.un.org/sustainabledevelopment/oceans/
8. Fish seeds indicate eggs, spawn, offspring, progeny or brood of the aquatic organism (including aquatic plants) being cultured. At this infantile stage, seed may also be referred to or known as fry, larvae, postlarvae, spat and fingerlings.

Table 3.A1.7. World fish and seafood projections

Calendar year

		Average 2013-15est	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
FISH¹												
World												
Production	kt	166 889	170 861	173 619	177 120	181 393	185 698	186 522	188 429	190 869	193 424	195 911
of which aquaculture	kt	73 305	77 708	80 214	83 531	87 527	91 583	94 404	95 257	96 941	99 425	101 768
Consumption	kt	166 187	170 782	173 546	177 043	181 322	185 623	186 444	188 356	190 792	193 344	195 827
of which for food	kt	146 648	151 503	154 286	157 788	162 071	166 357	168 542	170 098	172 328	175 040	177 679
of which for reduction	kt	15 623	15 359	15 426	15 498	15 580	15 680	14 402	14 834	15 116	15 031	14 951
Price												
Aquaculture ²	USD/t	2 145.2	2 082.8	2 002.7	1 931.9	1 831.5	1 803.5	1 849.1	1 970.5	2 035.7	2 115.5	2 184.3
Capture ³	USD/t	1 527.0	1 485.2	1 469.7	1 457.1	1 432.5	1 428.8	1 451.0	1 483.6	1 511.1	1 572.1	1 634.5
Product traded ⁴	USD/t	2 866.7	2 722.4	2 624.0	2 540.0	2 412.0	2 370.0	2 428.0	2 539.0	2 595.0	2 661.0	2 719.0
Developed countries												
Production	kt	29 018	29 198	29 165	29 215	29 353	29 430	29 433	29 326	29 247	29 251	29 305
of which aquaculture	kt	4 393	4 591	4 677	4 808	5 021	5 227	5 332	5 305	5 319	5 412	5 521
Consumption	kt	36 748	36 542	36 468	36 499	36 784	36 981	37 077	36 996	37 294	37 608	38 045
of which for food	kt	31 917	31 678	31 778	31 880	32 231	32 500	32 635	32 673	33 065	33 441	33 950
of which for reduction	kt	4 387	4 432	4 270	4 211	4 156	4 096	4 070	3 953	3 861	3 801	3 732
Developing countries												
Production	kt	137 871	141 663	144 454	147 905	152 040	156 267	157 090	159 103	161 622	164 173	166 606
of which aquaculture	kt	68 911	73 117	75 537	78 723	82 507	86 356	89 073	89 953	91 622	94 013	96 247
Consumption	kt	129 439	134 240	137 079	140 544	144 539	148 642	149 367	151 360	153 499	155 735	157 781
of which for food	kt	114 732	119 825	122 509	125 908	129 839	133 857	135 907	137 425	139 264	141 599	143 730
of which for reduction	kt	11 235	10 927	11 156	11 286	11 424	11 584	10 332	10 881	11 255	11 230	11 220
OECD												
Production	kt	31 135	31 192	31 369	31 485	31 635	31 773	31 493	31 540	31 651	31 727	31 842
of which aquaculture	kt	6 165	6 457	6 549	6 677	6 932	7 196	7 358	7 344	7 376	7 500	7 628
Consumption	kt	38 680	38 996	39 153	39 258	39 587	39 838	39 809	39 870	40 306	40 710	41 227
of which for food	kt	32 314	32 600	32 777	32 958	33 370	33 686	33 855	33 940	34 411	34 850	35 410
of which for reduction	kt	5 827	5 833	5 824	5 758	5 684	5 629	5 442	5 417	5 381	5 348	5 304
FISHMEAL⁵												
World												
Production	kt	4 436.9	4 506.7	4 626.0	4 723.5	4 819.3	4 914.3	4 654.9	4 846.3	4 991.0	5 047.4	5 103.4
from whole fish	kt	3 164.9	3 166.2	3 207.9	3 241.8	3 274.9	3 310.9	3 002.9	3 125.4	3 208.2	3 198.1	3 188.8
Consumption	kt	4 523.4	4 527.1	4 534.7	4 664.5	4 770.5	4 893.7	4 945.2	4 730.3	4 906.0	4 982.5	5 077.1
Variation in stocks	kt	-86.5	-20.3	91.3	59.1	48.8	20.6	-290.3	116.0	85.0	64.8	26.3
Price ⁶	USD/t	1 671.0	1 397.2	1 101.1	1 114.7	1 156.5	1 203.2	1 383.4	1 325.5	1 360.0	1 388.9	1 435.2
Developed countries												
Production	kt	1 351.7	1 483.1	1 484.9	1 507.6	1 535.0	1 557.7	1 586.3	1 596.9	1 612.8	1 636.0	1 657.9
from whole fish	kt	893.7	915.1	886.2	877.7	869.4	860.3	858.5	837.7	822.5	813.4	802.6
Consumption	kt	1 887.3	1 711.6	1 693.4	1 705.8	1 709.7	1 724.9	1 693.4	1 608.8	1 639.8	1 629.7	1 627.8
Variation in stocks	kt	-32.3	27.7	22.3	10.1	9.8	6.6	-79.3	41.0	20.0	14.8	8.3
Developing countries												
Production	kt	3 085.2	3 023.7	3 141.1	3 215.9	3 284.4	3 356.6	3 068.6	3 249.4	3 378.3	3 411.4	3 445.6
from whole fish	kt	2 271.2	2 251.1	2 321.7	2 364.0	2 405.5	2 450.6	2 144.4	2 287.7	2 385.6	2 384.7	2 386.2
Consumption	kt	2 636.1	2 815.4	2 841.4	2 958.6	3 060.8	3 168.8	3 251.8	3 121.4	3 266.3	3 352.8	3 449.4
Variation in stocks	kt	-54.2	-48.0	69.0	49.0	39.0	14.0	-211.0	75.0	65.0	50.0	18.0
OECD												
Production	kt	1 580.7	1 731.7	1 765.8	1 785.0	1 806.5	1 826.9	1 815.1	1 843.1	1 868.6	1 894.2	1 918.5
from whole fish	kt	1 134.6	1 180.8	1 186.6	1 177.1	1 165.4	1 156.5	1 116.8	1 115.9	1 112.9	1 108.6	1 102.8
Consumption	kt	2 038.7	1 836.1	1 822.7	1 844.3	1 856.0	1 880.8	1 854.4	1 771.4	1 812.4	1 808.2	1 812.2
Variation in stocks	kt	-41.2	42.7	47.3	15.1	4.8	6.6	-124.3	61.0	40.0	19.8	13.3


StatLink  <http://dx.doi.org/10.1787/888933382202>

Table 3.A1.7. **World fish and seafood projections (cont.)**

Calendar year

		Average 2013-15est	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
FISH OIL⁵												
World												
Production	kt	857.8	918.1	933.8	948.9	965.5	981.8	935.0	966.1	990.0	997.7	1 005.6
from whole fish	kt	531.4	591.0	594.6	597.5	600.8	604.8	546.2	565.6	577.7	573.4	569.2
Consumption	kt	862.7	912.3	917.1	937.5	952.2	976.5	983.8	964.3	976.4	981.2	998.2
Variation in stocks	kt	-4.9	5.8	16.7	11.4	13.4	5.3	-48.8	1.8	13.6	16.6	7.4
Price ⁷	USD/t	1 922.3	1 913.1	1 704.2	1 665.5	1 679.5	1 730.6	1 966.8	1 826.4	1 830.6	1 837.6	1 862.7
Developed countries												
Production	kt	390.1	399.4	400.4	406.2	413.7	419.6	426.6	429.4	433.2	438.8	444.1
from whole fish	kt	170.5	184.7	177.5	175.2	173.2	170.9	170.0	165.1	161.1	158.7	155.8
Consumption	kt	533.3	593.6	568.9	574.0	583.0	600.3	617.3	584.0	590.6	591.5	602.9
Variation in stocks	kt	-11.6	10.8	3.7	3.4	3.4	3.3	-15.8	0.8	2.6	2.6	2.4
Developing countries												
Production	kt	467.7	518.7	533.4	542.6	551.9	562.1	508.4	536.8	556.7	558.9	561.6
from whole fish	kt	360.9	406.3	417.1	422.3	427.6	433.9	376.1	400.5	416.5	414.7	413.4
Consumption	kt	329.3	318.7	348.2	363.5	369.1	376.2	366.5	380.3	385.8	389.7	395.3
Variation in stocks	kt	6.7	-5.0	13.0	8.0	10.0	2.0	-33.0	1.0	11.0	14.0	5.0
OECD												
Production	kt	489.4	504.5	514.0	520.8	528.5	536.0	537.3	545.7	553.4	561.7	569.7
from whole fish	kt	237.4	255.7	255.1	251.7	248.1	245.3	236.7	235.4	233.4	231.6	229.4
Consumption	kt	656.0	687.3	679.8	693.2	706.3	727.7	738.6	715.2	724.0	725.9	739.0
Variation in stocks	kt	-18.8	20.8	13.7	8.4	3.4	0.3	-22.8	0.8	3.6	6.6	2.4

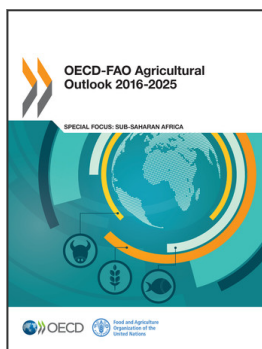
Note: The term "fish" indicates fish, crustaceans, molluscs and other aquatic animals, but excludes aquatic mammals, crocodiles, caimans, alligators and aquatic plants.

Average 2013-15est: Data for 2015 are estimated.

1. Data are in live weight equivalent.
2. World unit value of aquaculture fisheries production (live weight basis).
3. FAO estimated value of world ex vessel value of capture fisheries production excluding for reduction.
4. World unit value of trade (sum of exports and imports).
5. Data are in product weight.
6. Fishmeal, 64-65% protein, Hamburg, Germany.
7. Fish oil, any origin, N.W. Europe.

Source: OECD/FAO (2016), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database). doi: dx.doi.org/10.1787/agr-outl-data-en

StatLink  <http://dx.doi.org/10.1787/888933382202>



From:
OECD-FAO Agricultural Outlook 2016-2025

Access the complete publication at:
http://dx.doi.org/10.1787/agr_outlook-2016-en

Please cite this chapter as:

OECD/FAO (2016), "Fish and Seafood", in *OECD-FAO Agricultural Outlook 2016-2025*, OECD Publishing, Paris.

DOI: http://dx.doi.org/10.1787/agr_outlook-2016-12-en

This work is published under the responsibility of the Secretary-General of the OECD and the Director-General of the FAO. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries, or the governments of the FAO member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.