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Analysis of Changes in Fish Acquisition and Consumption in Poland: Selected Aspects

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Abstract: This study analyzes fish catches and consumption in Poland. The specific objectives include examining the structure of marine fish catches by fishing location and species, analyzing the dynamics of marine and freshwater catches, and evaluating fish consumption. The study is based on desk research methods, including descriptive, analytical, and statistical approaches. The results show a decreasing share of Baltic catches and an increasing share of distant-water catches in Polish marine fisheries, with distant-water catches growing relatively dynamically, while Baltic catches show a low average annual growth rate. Baltic catches are mainly composed of sprat, herring, flatfish, and cod, with sprat and herring dominating. Catch limits introduced to protect declining stocks are reflected in catch volumes. Poland is one of the largest carp producers in Europe and the largest in the European Union, with production mainly intended for the domestic market, while the Czech Republic is the largest exporter of carp in Europe. Fish consumption in Poland increased to nearly 14 kg per capita in 2024, which is about half of the European Union average. Despite FAO recommendations and the nutritional benefits of fish, rising prices of fish and their substitutes limit consumption.

Keywords: nutritional value of fish; fish catches; fish consumption; fish prices

JEL Classification: P2; P22; Q00

1. Introduction

Fish have been harvested by humans and formed part of their diet since prehistoric times, with archaeological evidence indicating their consumption at least 10–12 thousand years ago. Numerous archaeological findings from different geological periods across all continents confirm this. These include remains of fishing tools such as bone and horn harpoons used for large fish or hooks made of shells and bones, as well as fish remains found in ancient settlements (Cios, 2007; Rudnicki, 1989; Rybacy.com, 2026a). Fishing practices have evolved alongside the development of human civilization. Aquatic organisms harvested from marine and freshwater environments gradually ceased to serve solely subsistence needs and became objects of trade.

Fish are of considerable economic and nutritional importance. They provide high-value meat and roe and constitute a significant source of dietary protein. The nutritional value of their meat is very similar to that of livestock. The content of high- quality, easily digestible protein in fish meat ranges from 8-20% (in livestock meat, it is 15-20% respectively). Fish contain easily digestible proteins with a digestibility of over 90%. They have essential amino acids with a very favorable composition, allowing for optimal utilization of proteins by the body. Fish contain minerals important for the human body, such as phosphorus and calcium, as well as vitamins, including those from the B group. Marine fish additionally contain iodine and fat-soluble vitamins A and D (vitamin D3 is responsible for calcium-phosphorus metabolism in the body and regulates insulin levels, which affects blood sugar levels). Moreover, fish are a key source of essential unsaturated fatty acids, particularly long-chain omega-3 polyunsaturated fatty acids such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are scarce in many other food products. Omega-3 fatty acids play an important role in human health. They are associated with the prevention of cardiovascular diseases, support brain development and cognitive functioning, contribute to proper vision, and help reduce blood triglyceride levels. Their intake is also linked to a lower risk of certain chronic diseases (Mania et al., 2012).

FAO and WHO recommend regular fish consumption, typically one to two portions per week. In Poland, however, fish consumption remains relatively low, averaging approximately 14 kg per capita annually. For comparison, the average fish consumption in the European Union over a similar period was almost twice as high (23.7 kilograms). Among EU countries, the highest fish consumption is in Portugal (53.6 kilograms), followed by Spain (40.7 kilograms) and France (32 kilograms), while the lowest is in the Czech Republic (5.6 kilograms) (EUMOFA, 2026).

Despite their nutritional benefits, fish and seafood may also contain harmful substances resulting from environmental pollution, including methylmercury, dioxins, polychlorinated biphenyls, and radionuclides. For this reason, authors like: Mania et al. (2012) point out that in many European Union countries with high fish and seafood consumption, dietary recommendations have been introduced regarding the limitation of consumption of certain types of fish. These recommendations mainly concern women planning pregnancy, pregnant women, breastfeeding mothers, and children. The importance of these issues is reflected in Commission Regulation (EU) No 617 of 12 April 2022 regarding the maximum permissible levels of mercury in fish and salt (Mania et al., 2012; European Commission, 2026; Commission Regulation (EU) 2022/617).

However, there is a potential risk resulting from increased fish consumption in the presence of substances that have a harmful effect on the human body, as noted by Kołodziejczyk (2007).

Beyond their direct role as food, fish constitute an important raw material for the production of pharmaceuticals (e.g., cod liver oil), fertilizers, glues, and animal feed.

Globally, the largest producer of fish and other aquatic organisms in the world (catch and aquaculture together with aquatic plants) is China (40.2% in 2023). It is followed by Indonesia (10.2%), India (7.7%), Vietnam (3.9%), Russia (2.5%), and Bangladesh (2.2%). The

countries of the European Union together account for approximately 2% of the global supply. Within the EU, Spain is the largest producer (0.4%). This ranks the country 26th in the world, while Poland occupies a much lower position- only 67th (Hryszko, 2024; Szymańska, 2020).

Poland is nevertheless one of the largest producers of carp in Europe and the leading producer within the European Union– a warm-water freshwater fish (30% of the entire EU production). The next places are taken by the Czech Republic and Hungary. Carp farming in Poland is based primarily on traditional earthen pond systems. The Czech Republic, on the other hand, is the largest exporter of carp in Europe and also exports trout (Portal spożywczy., 2026 b)

Fish resources are considered an important renewable and relatively low- emission source of food. According to FAO, they may play a significant role in ensuring food security and supporting healthy diets for the growing global population (FAO, 2024).

2. Methodology

To assess changes in fish catches and consumption in Poland, the study relied on secondary data obtained from specialized reports published by the Institute of Agricultural and Food Economics- National Research Institute, as well as from the official electronic database of Statistics Poland.

The analysis covers the period 2005–2024. The subject scope includes marine fish catches conducted by Polish fisheries in the Baltic Sea, the Szczecin and Gdańsk Lagoons, and outside Polish maritime areas (distant-water fisheries), as well as inland fisheries. In addition, the study examines fish consumption in Poland and trends in retail prices of selected fish products.

The research employed a desk research approach supported by descriptive, analytical, and quantitative statistical methods. The applied measures included structure indices, absolute and relative changes, and individual dynamics indices.

3. Results and Discussion

3.1. Marine Fishing

Polish marine fisheries consist of the following two segments: Baltic, including lagoon fishing, and deep-sea fishing. In the years analyzed, 2005-2024, Baltic catches had a dominant share in Polish marine fishing, especially in the initial period. In year 2004, these catches accounted for slightly over 91% of the total Polish marine catches. In the later period, a decrease in their share of total catches is observed, down to almost 58% in year 2024. The declining Baltic catches were mainly due to restricted fishing quotas (Hryszko, 2024; Szymańska, 2021). At the same time, the share of distant-water fisheries increased (from 8.8% in year 2005 to 42.3% in year 2024).

Polish marine catches, despite some variability, were characterized by an average annual growth rate of around 1.59 thousand tons in live fish weight in the years 2005-2024. A similar situation applied to distant-water fisheries (average annual growth rate of 1.56 thousand tons in live fish weight). Although an average annual increase was observed for Baltic catches, its

growth throughout the entire analyzed period was relatively much lower (0.03 thousand tons in live fish weight, respectively). This limited growth was influenced by a noticeable decline in Baltic catches during the years 2019– 2024 (Figure 1).

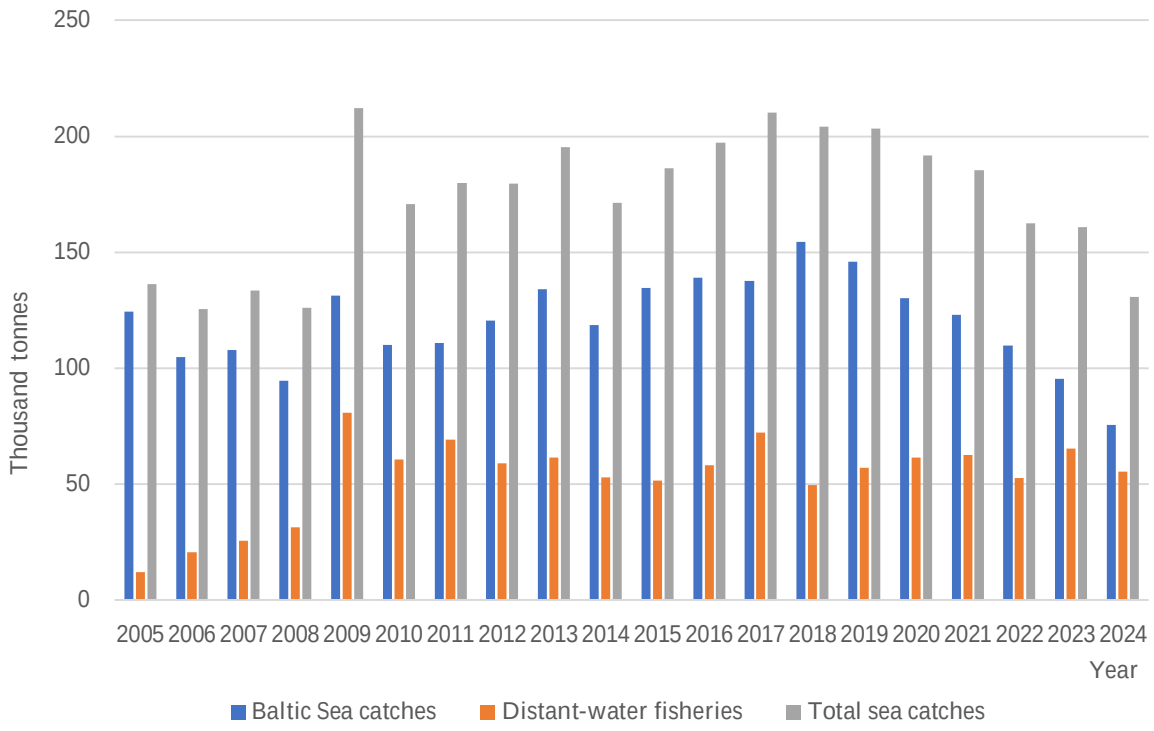

Figure 1. Volume of Polish marine catches, 2005–2024 (thousand tonnes, live weight)

The structure of Baltic catches is dominated by four species: sprat, herring, flatfish, and cod. The total average annual share of catches of these fish in the years 2005-2024 was 94.5%. The largest share was of sprats (54.8%), followed by herring (23.6%), with less for flatfish (9.2%) and cod (7%). Despite fluctuations, over the analyzed years there has been a strengthening in the share of sprat catches (69.9% in year 2024, compared to 43.3% in year 2016, when this share was the lowest among the years 2005-2024). The position of herring in catches has weakened (19.9% of catches in year 2024, compared to 36.2% in year 2018, when it was the highest among the analyzed years). A similar situation applies to flatfish (5.2% of catches in year 2024, compared to 12% in year 2012, when it was the highest among the analyzed years) and cod (0.1% of catches in year 2024, compared to 14.4% in year 2006, the year when it was the highest among the analyzed years).

Restrictions on catches introduced to protect declining fish stocks are reflected in the observed catch volumes. The observed variability in the catch of these fish species between year 2005 and year 2024 has resulted in the average annual catches of Baltic cod decreasing relatively the most (by 0.79 thousand tons), much less so for sprat (a decrease of 0.04 thousand tons). However, an increase in herring catches was noted (an average of 0.46 thousand tons per year) along with a relatively small increase in flatfish catches (by 0.03 thousand tons, respectively). Nevertheless, in 2024 the catches of all these species were lower than in 2005: cod (as much as 99.2% less, only 0.1 thousand tons), flatfish (respectively 64.9% less, 3.9 thousand tons), herring (31.2% less, 15 thousand tons), sprat (29.2% less, 52.7 thousand tons).

The total catch of other fish species also decreased (by 11.9%, to 3.7 thousand tons in 2024) (Figure 2).

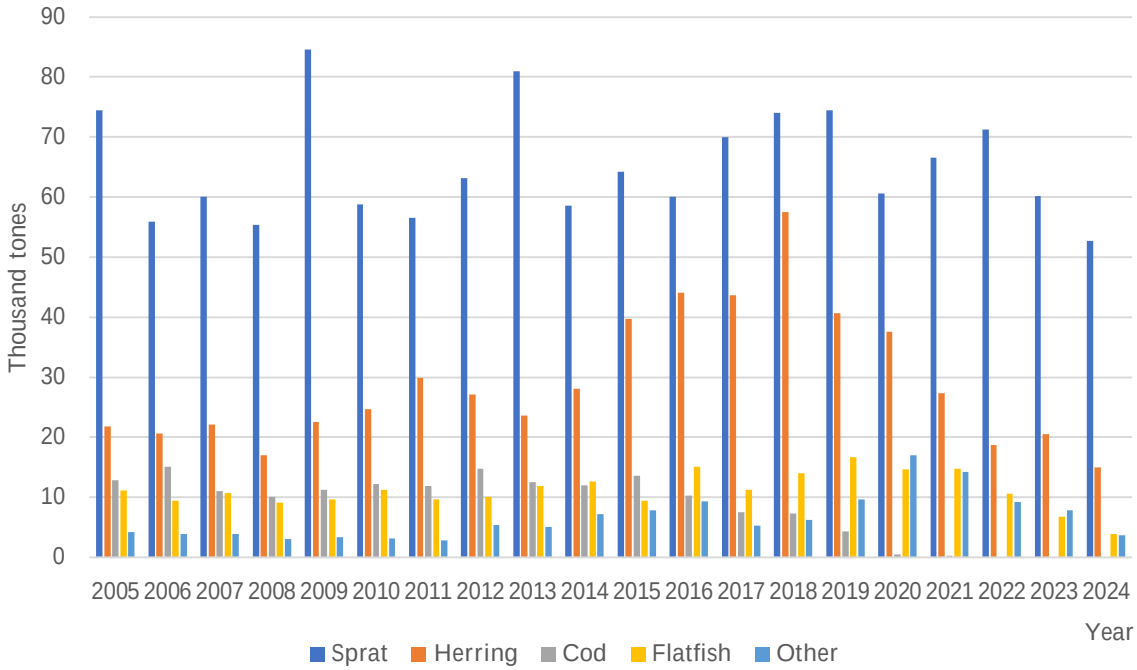

Figure 2. Baltic Sea catches by species in Poland, 2005–2024 (thousand tonnes, live weight)

Analysts point out the factors limiting the development of the analyzed market, including rising production costs and high inflation correlated with interest rates, which affect both the shaping of domestic demand and the investment opportunities in the industry (Hryszko, 2024).

In the final years of the analyzed period, Polish distant-water fisheries operated mainly in the Pacific Ocean (grenadiers and chub mackerels) and the North Atlantic (blue whiting). In the structure of these catches, blue whiting dominated (68.7%), followed by Chilean grenadiers (18%) and chub mackerels (4.5%). Together, these fish species accounted for just over 91% of Poland's distant- water fisherie. In earlier years, mainly pollock and krill were caught (Hryszko, 2024; Szymańska, 2021).

3.2. Freshwater Fishing

Freshwater fish are considered an important source of supply for the Polish fish market. Their production includes aquaculture (fish and crustacean farming), commercial inland fisheries conducted in fishing areas such as lakes, reservoirs, and river sections, as well as recreational fishing (angling) (Regulation No 1380/2013 of the European Parliament and of the Council of 11 December 2013; Hryszko, 2024).

The largest share in the production and consumption catches of freshwater fish in Poland in the analyzed years 2005–2024 was held by aquaculture, whose share increased (from 62.6% in year 2005 to 79.9% in year 2024). Recreational fishing and professional catches had significantly smaller shares, which decreased (in year 2005 compared to year 2024, from 31.5% to 17.8% and from 5.9% to 2.3%, respectively).

Over the analyzed years, the volume of fish catches from aquaculture increased, while that from commercial fishing and angling decreased. In year 2024, 49.4 thousand tons came from aquaculture (34.3% more than in year 2005). The average annual increase of these catches is estimated at 0.79 thousand tons, despite fluctuations in some periods. Commercial catches in year 2024 amounted to 1.4 thousand tons (59.7% less than in year 2005, decreasing on average by 0.01 thousand tons per year). In year 2024, 11 thousand tons of fish were obtained from recreational fishing (40.5% less than in year 2005). The average annual decrease in these catches is estimated at 0.33 thousand tons (Figure 3).

Poland is one of the largest producers of carp in Europe and the largest in the European Union – a freshwater, warm-water fish. Almost the entire production (about 18 thousand tons) is intended for the domestic market. Fish farms are located in various regions of the country (Hryszko, 2024; Szymańska, 2021).

Carp farming in Poland is carried out mainly in earthen fish ponds, utilizing the natural production capabilities of the land and its waters. This type of activity is considered to be extensive production, sometimes referred to as ecological (organic) production, which does not negatively affect the state of the natural environment.

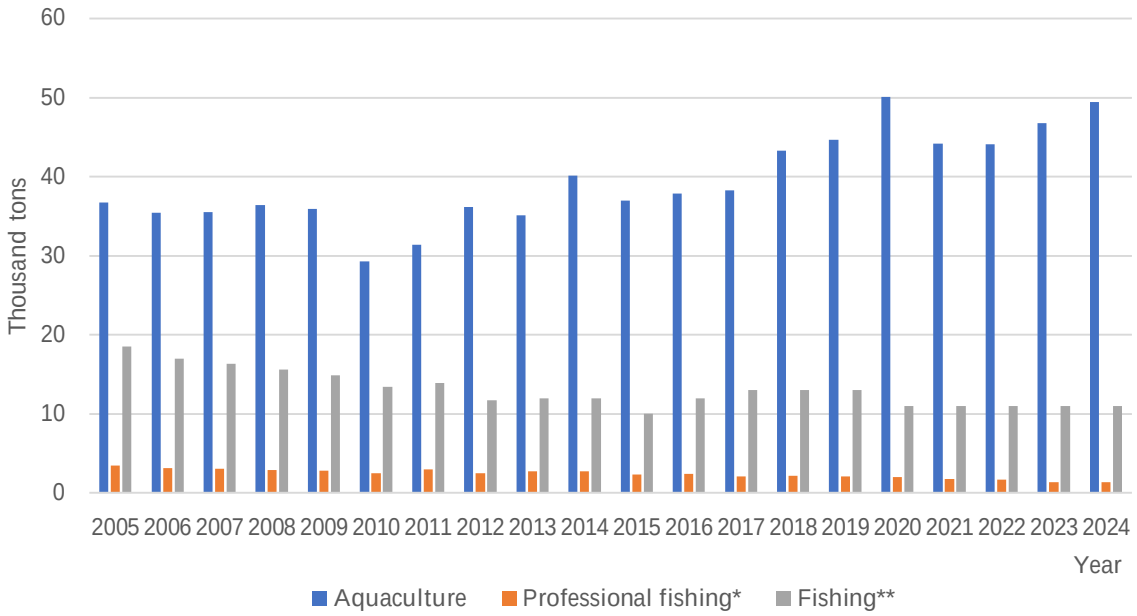

Figure 3. Catch of freshwater fish for consumption, 2005–2024 (thousand tonnes)
Note: *In fishing areas covering lakes, reservoirs, and river sections **estimate

The average annual national supply of fish, seafood, and their products is increasing, and by the end of the studied period (year 2024) it amounted to almost 523 thousand tons in live weight equivalent. This was solely due to an increase in net imports, with a significant decline in domestic catches, which led to a decrease in the self-sufficiency rate to 34.7%, as analysts emphasize (Hryszko, 2024).

The use of fixed-base indices (2015=100) allows the identification of three phases shaping the contemporary architecture of trade exchange: the pre-referendum stabilization period, the uncertainty phase (2019–2020), and the period of operation outside the EU single market (after 2021).

3.3. Fish Consumption

Over the analyzed period, fish consumption in Poland, measured in live weight per capita (according to FAO calculations), increased to almost 14 kilograms in year 2024 (up 2.7 kilograms compared to year 2005). The fluctuations in this consumption between year 2005 and year 2024 resulted in a relatively modest average annual growth (by 0.07 kilograms) (Figure 4).

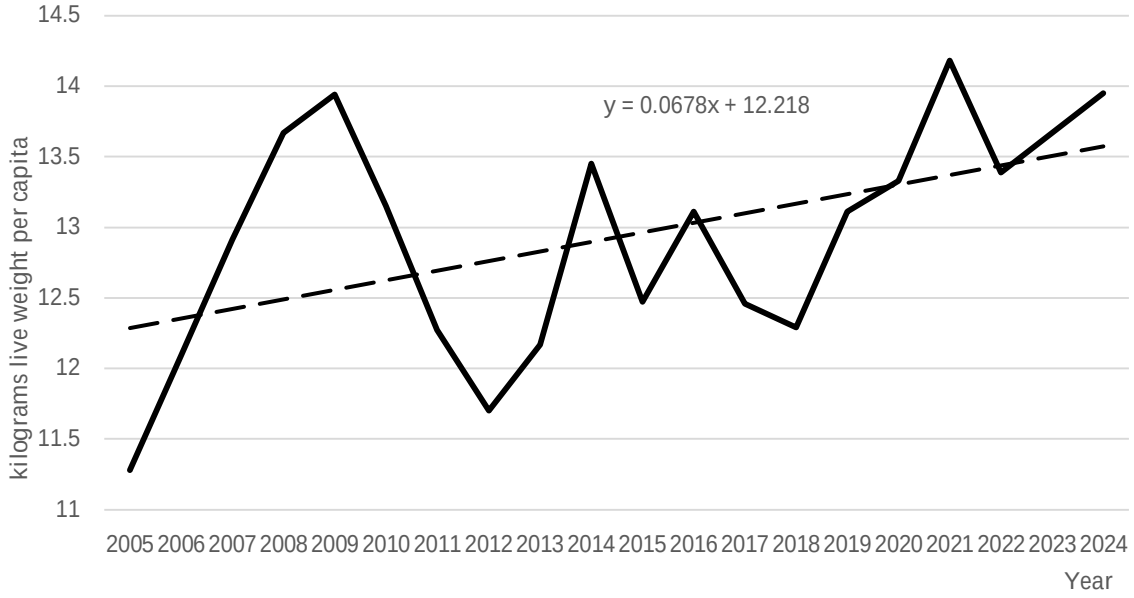

Figure 4. Fish consumption in Poland, 2005–2024 (kg live weight per capita)

Despite the observed increase, per capita fish consumption in Poland remains lower than both the European Union and global averages. In year 2024, this difference was nearly 10 kilograms (on average, almost 24 kilograms of fish were consumed in the European Union over a comparable period), while worldwide, 20 kilograms of fish were consumed, compared to just under 14 kilograms in Poland (Hryszko, 2024; EUMOFA, 2026)

Analysts note that in Poland fishery products are generally regarded as a third-choice source of animal protein, after meat and dairy products. Additionally, demand for fish and fish products responds relatively quickly to changes in buyers' incomes and the prices of these products, in situations of changes in the market value being analyzed; in the last years studied, the increase in the value of the fish market in Poland was caused by rising product prices (Tubilewicz, 2026; Hryszko, 2024). Fish consumption in Poland also exhibits clear seasonal patterns, with the highest demand occurring during the Christmas period. Analysts emphasize the strong role of freshwater fish (especially carp) and imported and farmed sea fish (trout, salmon) in this consumption.

Average fish consumption in Poland also varies by species. Over the period 2005–2024, the highest average annual consumption per capita was recorded for pollock (2.72 kilograms per year in live weight equivalent), followed by herring (2.4 kilograms) and mackerel (0.97 kilograms) (Figure 5).

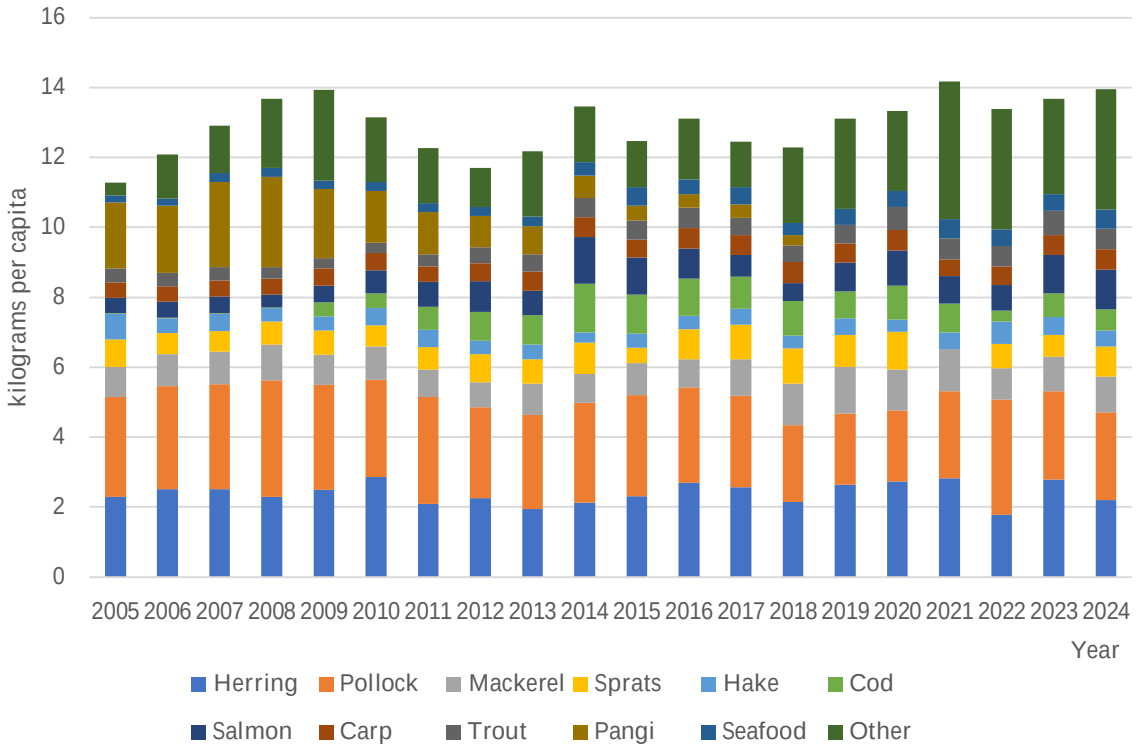

Figure 5. Structure of fish consumption by fish species and seafood consumption in Poland in 2005-2024 (kilograms of live weight per capita)

In the years analyzed, changes in the consumption of individual fish species were observed. Cod consumption grew relatively most dynamically (on average by 0.04 kilograms per year in live weight equivalent), followed only slightly slower by salmon (0.03 kilograms, respectively), then by trout and seafood (0.02 kilograms each), and mackerel and carp (0.01 kilograms each). Consumption of herring and sprat was characterized by a small growth dynamic (both less than 0.00 kilograms). On the other hand, the average annual consumption of pangasius decreased (by 0.14 kilograms), followed by pollock (by 0.03 kilograms) and slightly by hake (less than 0.00 kilograms). The remaining types of consumed fish were characterized overall by an average annual growth dynamic of 0.11 kilograms.

In the final year of the analyzed period, per capita consumption of fish and seafood slightly exceeded their recorded supply. Analysts attribute this discrepancy partly to Poland's declining population in 2024 (Hryszko, 2024).

Over 2005–2024, retail prices of fish and fish products increased. Data analysis shows that the most dynamic growth occurred for frozen hake fillets (an average of 1.21 PLN per kilogram annually, reaching 40.10 PLN per kilogram in year 2024), followed by fresh trout (0.99 PLN per kilogram, reaching 37.97 PLN per kilogram), live carp (0.97 PLN per kilogram, reaching 37.60 PLN per kilogram), and gutted salted herring (0.72 PLN per kilogram, reaching 23.22 PLN per kilogram) (Figure 6).

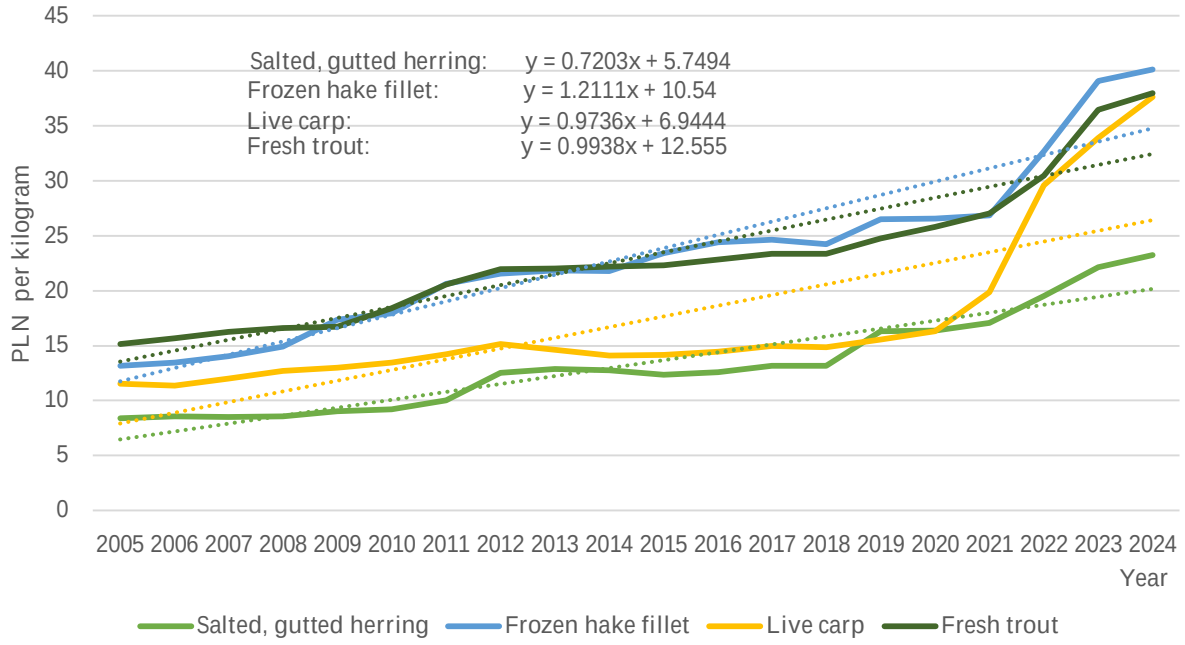

Figure 6. Retail prices of selected fish and fish products in Poland, 2005–2024 (PLN per kg)

The average increase in fish and seafood prices in Poland in year 2024 was 1.6% compared to the previous period (rising twice as slowly as the increase in food and non-alcoholic beverage prices over the same period). It was also lower than the average increase in these prices in the European Union countries (2.1%). Fish and seafood prices increased the most in Romania (by 6.4%), Greece and Croatia (by 5.7% each), and Malta (by 5.5%). A decrease in prices for these products occurred, however, in Lithuania, Hungary, Cyprus, Finland, and the Czech Republic (from 0.1% to 4.4%) (Hryszko, 2024; Szymańska, 2021; Statistical Office in Szczecin, 2026; Statistics Poland, 2025). Changes in retail prices of fish and fish products influenced demand conditions in the market.

Retail prices of selected substitutes for fish and fish products also increased. For frozen hake fillet, whose prices are monitored by the Central Statistical Office (Satistics Poland, 2025), the following substitutes were considered: gutted chickens, central pork loin (with bone since 2016), and beef with bone – ribeye.

In the years analyzed, the relationship between the average retail price of 1 kilograms of frozen hake fillet and the corresponding price of 1 kilograms of beef with bone – sirloin – changed. In year 2024, for the equivalent of 1 kilograms of frozen hake fillet, the average consumer could buy 0.84 kilograms of sirloin (less in year 2005, only 0.79 kilograms). The ratios of the average retail price of 1 kilograms of frozen hake fillet to the corresponding prices of 1 kilograms of center-cut pork loin and eviscerated chickens have also changed. In year 2024, for the equivalent of 1 kilograms of frozen hake fillet, the average consumer could buy 1.54 kilograms of bone-in center-cut pork loin (less in year 2005, only 1 kilograms, but boneless center-cut pork loin) or 3.35 kilograms of eviscerated chickens (respectively 2.84 kilograms). These relative price changes may have encouraged some consumer groups to substitute frozen hake fillet with beef, pork, or poultry products.

5. Conclusions

The study showed that the share of Baltic catches in Polish marine fisheries is decreasing (to almost 58% in 2024), while the share of distant-water fisheries is increasing. The observed changes are mainly due to restricted fishing quotas (EU Common Fisheries Policy), as analysts emphasize.

The volume of distant-water catches is growing relatively dynamically. The average annual growth rate was estimated at 1.56 thousand tons in live fish weight for the years 2005-2024. On the other hand, Baltic catches are characterized by a small average annual growth rate (0.03 thousand tons, respectively) over the same period.

The majority of Baltic catches (on average over 94% annually) are based on the following four fish species: sprat, herring, flatfish, and cod. On average, in the years 2005-2024, the most caught was sprat (about 55%), followed by herring (over 23%), then less of flatfish (slightly over 9%) and cod (7%). Applying catch limits to these fish (sprat, herring, cod, and flatfish), in the context of protecting their declining stocks, is reflected in the volume of catches. On average per year, the catches of Baltic cod decreased relatively the most (by 0.79 thousand tons), followed by a much smaller decrease in sprat (down by 0.04 thousand tons). However, an increase was noted in herring catches (on average 0.46 thousand tons per year) and a relatively small increase in flatfish catches (by 0.03 thousand tons, respectively).

In the analyzed years, aquaculture, which supports sustainable fisheries, has the largest share in the production and consumption of freshwater fish in Poland, and its share is increasing.

Poland remains one of the largest carp producers in Europe and the leading producer within the European Union. Nearly all production is allocated to the domestic market. On the other hand, The Czech Republic is the largest exporter of carp in Europe.

In the years analyzed, fish consumption in Poland increased to almost 14 kilograms in 2024. On average, in the European Union during the same period, almost twice as much fish was consumed. Among EU countries, the most fish is consumed in Portugal, followed by Spain and France, while the least is consumed in the Czech Republic.

FAO recommends regular consumption of fish (1 to 2 times a week). Fish contain minerals important for the human body, such as phosphorus and calcium, as well as vitamins. The content of essential unsaturated fatty acids in fish meat, including those from the omega-3 family, makes fish and their products very valuable nutritional components.

A limiting factor in the consumption of fish and fish products is the observed rising prices of these products. During the period under study, the retail prices of frozen hake fillets increased relatively the most dynamically, followed by fresh trout, live carp, and headless salted herring. The volume of fish consumption is also influenced by the retail prices of substitute products for fish, which include dressed chicken, center-cut pork loin, and bone-in beef – roast beef. The prices of these products also increased. The relationships between the retail prices of the monitored fish species and the corresponding prices of their substitutes were unfavorable.

Market forecasts indicate a continued gradual increase in fish consumption in Poland. The annual growth of the fish market value is expected to be around 5-7%. An increase in the share of inland aquaculture, especially in the trout segment, is forecasted, along with the development of production for orders from large processing plants (Rybacy.com, 2026 b). According to analysts of this market, the main factors shaping the development of the fish market are: increasing consumer health awareness (the benefits of a diet rich in omega-3 fatty acids), rising incomes and changes in consumer culinary preferences, support for sustainable fisheries, and investments in gastronomy infrastructure and retail networks developing fish sections.

Conflict of interest: none

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