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Deliverable D 4.2

**Qualitative research report: analysis interviews
aimed mainly at identifying the main positive and
negative drivers of fish/seafood consumption (for the
chosen species)**

December 2016

Executive Summary

This deliverable (Deliverable 4.2) describes one of PrimeFish objectives within Work Package 4, to study and analyse the European seafood market in general and five specific seafood supply-chains in particular. Overall, Work Package 4 will highlight fish consumption within the consumers' diets, depending on country and types of consumers and will be used to simulate the effects of various price policies and provide indications of current and future trends and consumer behaviour in local, European and international seafood markets.

Qualitative studies were used to identify positive and negative motives, perceptions, associations, attitudes towards fish/seafood consumption, with a focus on the chosen species: salmon, trout, seabass, seabream, herring and cod. Eighteen individual in-depth interviews were conducted in five European markets (France, Germany, UK, Italy and Spain) summing up to a total of 90 cases, including heavy and light fish consumers. In each of the five countries, an overall analysis of the 18 interviews was done according to harmonised guidelines, resulting in five separate country reports. These reports are the bases of the work described in this deliverable (Deliverable 4.2.). The results of the interviews of task 4.2 in the PrimeFish project will be used as an input for the design of the quantitative study conducted within Task 4.3 and choice modelling within Task 4.4.

In general, French consumers place major emphasis on enjoyment in food consumption. A large variety of seafood products in France can be considered gourmet seafood and roughly half of the French population believes that their food budget is increasing. French consumers prefer to buy fresh fish. However, canned, smoked or frozen fish were often bought due to lower income and lack of knowledge and experience in buying fresh fish. For fresh fish, freshness was the single most important criteria, but generally for fish, origin was also very important, local products were preferred but products imported from outside of Europe avoided. Wild fish was preferred but the final choice of purchase was based on price. Due to negative news about farmed fish, information on farming was required and organic farming was preferred.

It is clear that German consumers find origin, sustainability, traceability and organic production of high importance, and in general they are well aware of certification labels in relation to this. Price, freshness, taste and appearance were important attributes as well. The most commonly consumed products are smoked fish, fresh and frozen fillets, canned fish and pickled/salted herring and seafood salads. Fresh fish and ready to heat or eat fish meals are trending in Germany but local culinary traditions remain high. Overall, fish was considered healthy and could be consumed more frequently. Fresh fish was preferred, but frozen fish was a compromise.

Chilled fish, especially natural products are seen by UK consumers as high quality and healthy choice, but ready to eat or heat fish, addresses many of the barriers to consumption. Format of product was an important attribute for fish purchase, and fresh and frozen fillets of different species were the most preferred, but whole fish, surimi, soup and sushi was less likely to be bought. The most common form of products were canned, fresh fillets, natural or breaded fresh or frozen fillets,



processed/transformed fish such as fish fingers and burgers. Price was the single most important criteria for UK consumers, but was less important for those who had food satisfaction and enjoyment as a high priority. Freshness was an issue and health was important in relation to natural and fish without additives. Environment and ethic aspects were important especially among younger and well educated people. Organic and Fairtrade certification were important and generally wild fish was preferred to aquaculture species. Origin was not of importance and few would mind if the fish was imported.

Fisheries have a strong tradition in Italy and play a central role in the social and cultural environment of the communities located close to the sea. Compared to many European countries, fish consumption is high in Italy and the respondents estimated their fish consumption had increased during the last five years, mainly as a healthy substitute for meat. Fresh fish was by far the most preferred type of product by the Italians. Frozen, canned, salted, and smoked were also rather popular. The single most important attributes for fish was freshness. Quality was very important and quality was not likely to be traded off against lower prices, although consumers could resort to buying different species to save money. Origin was very important and trust in salespersons was critical for the purchase of fresh products and brands for processed or frozen fish.

Spanish consumers greatly appreciate fish and shellfish and the fish consumption frequency in Spain is high compared to most countries in Europe. Spanish consumers mostly consume fresh fish and other seafood such as shellfish, molluscs and crustacean. Canned, salted, dried and smoked products were rather popular as well. Ready to eat meals and processed fish were the least preferred products. Freshness was the most important determinant for buying fish. Appearance and origin were of importance and price/promotion affected buying decisions as well. Certification and labels, reputation and brand could also be an issue and the advice of the sellers could have a strong influence on buying decisions.

The selected PrimeFish focus fish species (trout, herring, salmon, sea bass, sea bream and cod) were recognised by participants in all five countries although participants' knowledge of the species varied by country. Salmon and trout were generally the species the participants were most familiar with, but herring was the least recognized, except in Germany where herring was familiar and traditional. Freshness, taste, health, production method and origin were a general common denominator for important attributes, while main barriers covered partly the same attributes, such as production method (bad farming practices) and taste but also bones, poor availability, and price.

To conclude, the results of this qualitative study in the five important European markets indicated how different these markets were, although several similarities were found. The results both confirmed previous extensive studies on these markets and provided more detailed insights into consumer fish purchase behaviour, motives and barriers for fish consumption, as well as use of new purchasing channels, experience and effects of media treatment of information.

Fish knowledge and interest varied between countries, e.g. in regard to origin and production methods. The participants in most of the countries were conscious about negative press, which was most often related to fish farming. Origin of the fish was also expressed as a concern. This did affect the consumption behaviour of the respondents to some degree, but differently between the five

countries. Generally, seafood has a positive image based on its nutrient content, being a light food and having a healthy image.

The main barrier for fish consumption in general, was price. In addition, lack of skills to prepare fish was mentioned (and bones). Health and taste were the main drivers for fish consumption, although in some cases, taste can also be a barrier.

For further analysis of these five markets in Europe, in quantitative studies, it is of value to include the main attributes identified in this qualitative study. In this respect, overall, freshness and taste were considered important attributes for fish as were health properties. This could include the consumer value of nutritional and health claims, and date of catch. Other attributes identified of value in these qualitative studies were production method (farmed or wild caught) and origin (local, European or outside of Europe). Trust in seller or store can be considered an issue in some markets and fish information and press affected people in different ways in regard to fish consumption behaviour.

The use of different formats, from whole to processed products for different species, as well as readiness of consumption at purchase, varied considerably between markets, and between locations. The purchase behaviour of people living close to the costal line could differ substantially from inland consumers, from whole to processed products for the different species, as well as readiness of consumption at purchase. Respondents in some of the markets, especially in Germany, were more concerned about sustainability, environmental issues and traceability than respondents in other markets, such as in UK.

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1 Introduction

The EU capture fish industry has its main challenges related to the supply of fish, both because of overfished stocks and because of the seasonality of main species. The challenges facing EU aquaculture include limited availability of sites, complex administrative and legal procedures and lack of market differentiation in terms of quality and in adapting to evolving consumer preferences. Roughly two thirds of all new products fail within two years and producers are unable to meet the demand or expectations of consumers. In order to be able to address these challenges, analysis of the seafood market is needed, including identifying criteria that characterise successful and unsuccessful products and their commercialization, analysing the behaviour of consumers, and to identify successful and not-so-successful consumer products, paying special attention to different cultural aspects on local and global markets.

This deliverable describes one of PrimeFish objectives which was to study and analyse the European seafood market in general and five specific seafood supply-chains in particular, and Work Package 4 will highlight fish consumption within the consumers' diets, depending on country and types of consumers and will be used to simulate the effects of various price policies and provide indications of current and future trends and consumer behaviour in local, European and international seafood markets. Qualitative studies were used to identify positive and negative motives, perceptions, associations, attitudes towards fish/seafood consumption, with a focus on the chosen species: salmon, trout, seabass, seabream, herring and cod. Eighteen individual in-depth interviews were conducted in five European markets (France, Germany, UK, Italy and Spain) summing up to a total of 90 cases, including consumers frequently and less frequently consuming fish. The reason for using interviews instead of focus groups was that studies have found that participants generate more and better ideas when in in-depth interviews compared to focus groups (Danes, Hess, Story, & York, 2010; Diehl & Stroebe, 1987; Fern, 1982). Although focus groups are usually conducted with the idea that listening to other people might trigger relevant memories (Lindlof & Taylor, 2010), the effects of production blocking (partly due to internal censoring) are stronger, causing in-depth interviews to be superior both in terms of quantity and quality of ideas generated by participants (Danes et al., 2010; Diehl & Stroebe, 1987; Fern, 1982; Stokes & Bergin, 2006).

The results were compiled within this deliverable, D4.2 and these results will be used as an input for the design of the quantitative study conducted within Task 4.3 and choice modelling within Task 4.4.

1.1 Markets

Available market information from the five selected European markets provide some insight to the past trends in fish consumption behaviour in the countries and are summarised in following subchapters.

1.1.1 France

There are many reasons why France is known as the Gastronomical Capital of the World. The French term “gourmet” can be used about a person with good taste and knowledge of food and takes great pleasure in food consumption. According to the results of a study realized in 2012 by BVA (French polling organization) for Gü (desserts producer), 90% of French people considered themselves gourmands (91% of women and 84% of men). Furthermore, being a gourmand doesn't mean not to care about their body, eight out of 10 are convinced that eating tasteful dishes and having a balanced diet are not contradictory. 58% claim that all types of products can be perceived as a delicacy, 30% only sweet food, 12% only salted (<http://www.lsa-conso.fr/>).

In 2015, the average monthly food budget of French people was equal to 365 euros. This amount varies according to income, age, and household composition. For example, people over 60 years spent 440 euros per month while those 18-24 years spent 237 euros. Moreover, roughly half of the French population believes that their food budget is constantly increasing (Le Sofinscope – Baromètre opinion Way pour SOFINCO).

Furthermore, the budget for Christmas dinner increased to 184 euros in 2015. The Christmas dinner is the occasion to have “chic” products considered too expensive for ordinary dinners (<http://www.lemonde.fr/>). The starter is usually composed of oysters, snails, crustaceans, smoked salmon and caviar. Such seafood is generally perceived as “luxury” products (<http://www.bbc.co.uk/>).

According to the INCA 2 study by AFSSA, 79% of French adults and 78% of children eat fish every week. An adult consumes on average 26.5 g of fish per day while a kid - 18.3 g. These results are very stable since 1998 and place France in the European average for fish and seafood consumption. Generally, people living in coastal areas in France consumed much more fish than people living elsewhere in France. Average consumption can be considered 2-3 times a week among people living in coastal areas, but 1-2 times a week elsewhere.

Generally, the daily consumption of fish was identical for men and women. As for kids, they mostly consume fish at the school canteen. The most consumed types of fish in France were canned tuna, salmon, cod, trout and canned sardines (<https://www.anses.fr/>).

The most frequently consumed fresh products in France were by far cod and salmon. Smoked fish was mainly salmon, but canned fish tuna, but also mackerel and sardine. Cod was the main frozen product (FRANCEAGRIMER / May 2015 / Consommation des produits de la pêche et de l'aquaculture 2014).

Obesity keeps growing in France (23.9%), especially in poor families.

1.1.2 Germany

A recent report published by German Office of the Norwegian Seafood council (2015), based on several market studies, described the seafood market in Germany. According to this overview, fish consumption in Germany (14.8 kg/capita/year) was at least two times lower than the average in European countries and much lower than in countries such as Portugal (57.1 kg/capita/year), Norway (53.4 kg/capita/year), France (43 kg/capita/year) and Sweden (31.1 kg/capita/year).

More than 50% of Germans consumed fish one time per week or more frequently, but 25% consumed fish one time per month or less frequently. Marine fish was preferred to freshwater fish and the most popular fish and seafood species were salmon, prawns (outside home also), Alaska Pollock and tuna. However, the most consumed fish in 2014 was Alaska Pollock (22%, fell by 16% compared to 2013), salmon (17%, rose by 5%) and herring (16%, decreasing trend).

In total, 65% of fish was consumed at home and 35% away from home. In German home consumption, the dinner plate was 9% fish. The other 91% were meat, vegetables and pasta. Many consume fish during dinner, or 47%, but 49% at lunch, 21% as supper/ light evening meal, 16% as snack and 7% at breakfast.

At home, most of the fish consumed was frozen fish (33%). However, the German consumers would like to eat more fresh fish, if there was more availability in fish counters in supermarket (43%), better value for money (42%), easier to see where fresh fish was caught, - if it was sustainable (32%), if there was a wider range of product ready-to-eat (26%), as they believed taste and health of fresh fish was better than that of frozen.

Salmon and saithe were the favourites during the week but smoked salmon at weekends. German consumers consumed more fish during weekends, most of the fish was consumed at breakfast.

Of marinated and smoked fish, 43% was consumed at home. Herring was the main fish species for canned, marinated and salad but was overall decreasing. The herring consumption was lowest among younger generations from less than 10% among consumers 18-34 years to over 45% among 65 years and older. Sushi consumption increased and 18% of Germans consume sushi. This percentage was higher among younger consumers, or 27% among people in the range of 20 – 29 years.

The older German consumers consumed more fish and seafood than the younger, and preference differed between age groups. The age group 20-29 consumed salmon most frequently (23%), prawns (14%) and octopus (8%); similar, the age group 30-49 consumed salmon (15%) and prawns (15%), less sole (4) and ocean perch (5%). Consumers 50 years and older consumed sole (16%) and prawns (16%) rather than salmon (10%) and ocean perch (10%).

Main reasons for fish consumption was good flavour (75%), health benefit (59%), a low-fat alternative (44%), enjoyed by the family, versatile and easy to cook (28% each). Main reasons for low fish consumption is that German consumers found it difficult to know if fish is fresh (49%), disliked fish (43%), found it difficult to buy fresh fish (37%) and bad smell during cooking (23%). It was also a barrier that children did not consume fish (23%), fish was not environmentally friendly (20%) and they found fish difficult to prepare (17%). Children disliked fish as they are afraid of bones (15%), disliked the smell (25%) and disliked the taste (73%).

Fresh fish was most often cooked in pan (53%), oven (13%), steamed (9%), barbequed (9%) or in wok (8%). Similarly, frozen fish was most often cooked in pan (46%) and then oven (40%), steamed (5%), barbequed (2%) or in microwave (1%). Fish dishes preferred were most often breaded (24%), fried saithe (19%), trout meuniere (11%), home-made soused herring (11%) or fried fish with potatoes (5%).

Fish origin was very important to 52% of German consumers and 28% consider it somewhat important. Norway is the most preferred country of origin. More than half of German consumers recognised MSC (56%) and WWF (53%) labels, and 36% recognised Bioland (organic label).

Future trends can be expected to be fresh fish in fish counters (supermarkets), modern availability (e.g. MAP) and take away fish. Children as well as older consumers need to be educated in taste of fresh fish instead breaded processed products.

Cooking tradition in older generation remains high, but depended on social status, travelling and leisure activities of pensioners (fast / light cooking, restaurant visits, enjoyment of live more common). New recipes, European and international way of cooking was popular among all ages, - by transmitting recipes from generations to generations and popular TV shows based on cooking ("Das perfekte Dinner", "Küchenschlacht", Jamie Oliver, Tim Mälzer). Generally, women were more involved in cooking and deciding about recipes (and food products).

Using ready-to-cook and ready-to-eat meals tends to increase in Germany, but depending on the social status. However, cooking is also a trend in Germany, mainly among younger generations, often as cooking with friends. Local culinary traditions remain high e.g. herring products are more used in North Germany than in the south part.

Obesity Keeps growing, especially in poor families, But less developed than in the US (23% in Germany vs 36% in the US).

1.1.3 UK

According to YouGov survey conducted for Seafish (September 2014), 73% of British adults did not know that they should eat two portions of fish per week, one of which should be an oil-rich fish. However, 75% of British adults knew omega-3 is linked to health benefits such as helping to keep normal blood pressure, maintaining good brain function and helping our bodies as a whole. Higher proportion of people 18-24 years were unable to identify an oil-rich fish (36%) but this figure was only 13% amongst 55+ year olds. Based on 52 w/e data to 16 August 2015 and refers to total fresh fish (including prepared, natural and seafood) (Kantar), fish attracted a much older consumer as 34% of all fish occasions were consumed by people over 65 years, compared to only 22% at a total food level. Further, health was a key to fish consumers, 47% of all servings were consumed for a health reason, compared to 39% at a total food level.

Based on data from SeaFish (2015) about the seafood consumption in UK (http://www.seafish.org/media/Publications/Seafood_Consumption_Fact_Sheet_Final.pdf) and Market Summary in 2015 (<http://www.seafish.org/research-economics/market-insight/market-summary>), the overall consumption of seafood in the UK was much higher in the past. A sharp decline in in-home fish consumption was observed starting mid-1940s when it reached its peak of 300g/person/week, driven by the much wider availability of fish compared to other protein sources during World War II. With increasing availability and falling prices of meat, fish consumption declined to below 150g/person/week in late 1970s. Historically the pattern of seafood consumption has been influenced particularly strongly by recessions. After the turn of the millennium, following an increase in fish consumption driven by growing awareness of the health benefits of seafood and lower prices

due to technological advances in aquaculture, fish consumption reached a peak 170g/person/week, but the last recession in 2007 has caused another fall in in-home seafood consumption to a below 147g/person/week in 2013. This is because seafood is a relatively expensive protein choice. And even though food prices currently experience deflation in the UK, fish prices fall slower than meat prices. At times of recession consumers choose cheaper protein sources. The decline of seafood consumption has been caused mainly by a decline in the in-home consumption while in 2013 the out of home consumption was estimated as 31g/person/week (not including take-away) and has stayed relatively stable since 2003.

An explosion in the seafood ready meal consumption was observed in 1990s which addressed key seafood barriers and shoppers dislike of choosing, handling and preparing seafood. The consumption of salmon has continued to increase while shellfish and pelagic species started to fall since 2007.

Austerity has also affected the way shopping is done in Britain. There has been a significant rise in the discounters and convenience channels in the past few years. Furthermore, 85% of the shoppers use at least four different retailers looking to reduce spending. Shopping is also in smaller quantities and much more frequent than in the past (average 26 times per month). Households have also changed in the past 20 years with a significant rise in one and two person households. In retail 97% of shoppers buy seafood. In 2014 a typical shopper bought a total weight of 14.5 kg of seafood worth £110 over 28 shopping per on average. Currently, the main seafood shopper demographic is aged 45-64 years and affluent, older couples or in a mature family two member households without children.

Chilled seafood was the most popular in 2014, followed by frozen and ambient. By segment, natural and prepared seafood products (including seafood meals), occupied nearly half of the UK seafood sales by volume.

Chilled natural in particular, is seen by shoppers as a high quality and healthy choice, whilst prepared seafood addresses many of the seafood barriers to consumption. From 2007 to 2014 the average retail price of seafood increased by over 37% and the total volume declined by 13.5%. Only chilled seafood segment was in growth during this period with volume up 7.9% despite an average price increase of 19.5%. Tuna is currently ranked number one in retail by volume, but has significantly declined over the same period, affected by rising production costs and sustainability issues hitting the news. By the end of 2015 salmon displaced tuna as the top seller in terms of volume.

Out of home consumption was similarly affected by austerity with many customers preferring to dine at home to save money or trading down to cheaper channels e.g. quick service restaurants. From 2008 to 2015, total seafood food service servings fell by 4.1%. Fried fish dominated the UK food service. Cod was the most popular species eaten out of home in 2014, followed by haddock, prawns and salmon. In general, consumers continued to buy the "Top 5" species, cod, haddock, tuna, salmon and prawns.

1.1.4 Italy

Fisheries are historically a crucial activity for the Italian Market, representing an important resource and source of opportunities, playing a central role in the social and cultural environment of the communities located close to the sea. The crisis that hit the economy in 2011 strongly affected the

Italian fishing industry, recording during the last 10 years an occupational level dropping by 40%, companies profitability reduced by 31% and the cost of production increased by 53% due to the rise of prices of oil, lack of structural policies from the government, and the cannibalizing competition (Confsalpesca, 2015).

In 2014, families in Italy spent on average 425 € for seafood products, showing a greater consumption in centre Italy, south part and islands with an average consumption of 478 € but a lower consumption in the north part (average 336 €). In general, the seafood product expenditure represented 8% of the total food and beverage consumption and 1.4% of the total annual expenditures, similar to the year 2013 (ISTAT, 2015).

Fresh fish, especially wild was preferred to frozen and frozen/thawed, according to a qualitative survey conducted by ISMEA (2011). Further, consumers associate flavour and nutritional properties more with fresh fish. Mussels, sea bream, anchovies, calamari, hake and cod, octopus, clams, sea bass, cuttlefish, salmon, sword fish, sardines and trout were the most preferred and consumed fresh fish in Italy, while tuna (canned) was the most preferred preserved fish (ISMEA, 2013). Cod fillets and hake fillets were among the most purchased frozen fish, but fish sticks the main processed frozen product. Smoked salmon stood out in the dried, salted, and smoked category.

Observing the trend of consumption in Italy, based on data provided by ISMEA (2013), the crisis of 2007 led to a significant decrease in per-capita consumption of fish. From 2008 to 2010 consumption slightly recovered, with a sensible growth from 2010 to 2011. The second economic crisis in 2011 again led to a dramatic decrease. Between 2007 and 2012, the fish consumption decreased from more than 21 kg to about 19 kg per capita. The internal production and exports declined respectively by 5.3% and 3.2% between 2007 and 2012. The 2011 increase in consumption was mainly compensated by imported products like salmon, mussels, sea bass, octopus, squids, trout and cod available at cheaper prices (ISMEA, 2013).

In a context of rationalization of food consumption caused by the economic crisis, fish products appear more vulnerable to cuts in household expenditure than other food categories. Changes in 2013/2012 amounted to -2.6% in quantity and -12.7% in value (Figure 1). The decline of fresh fish purchases was partially compensated by the shift from fresh to other categories such as dry, salted and smoked (+12%, with an increase of 19% shown only for cod). Frozen products showed a downward trend in purchase values but stable consumption in volumes. Value figures of preserved fish products increased slightly although the quantities recorded a decrease, due to the reduction of anchovies in oil purchases and tuna (CREA, 2015).

The purchasing outlet mostly used for the seafood products were supermarkets which represent 40% of total fish consumed in 2012. Products such as frozen, preserves, salted, smoked dominated, although the fresh counter at the supermarket was becoming more and more large spread in the Italian big distribution channel, representing a strong competition to specialized shops such as fishmongers. Despite this trend, in 2012, dedicated shops maintained the most important share (about 38%) on total fresh fish product purchasing.

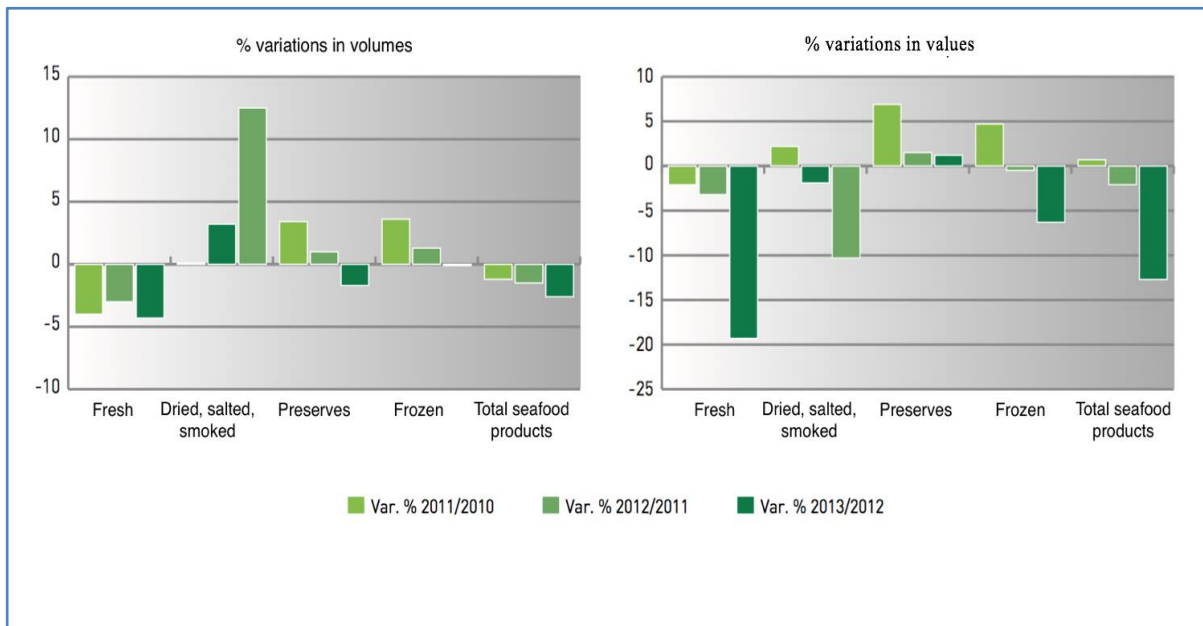


Figure 1. Dynamics of domestic purchasing of seafood products in Italy (2010-2013)

A decrease in consumption of most commonly consumed species was noted between 2012 and 2010, with the exceptions of sea bream which in 2012 showed a stable consumption in quantities and a decrease in value after presenting the opposite trend in the previous period. The best performance in the 2012/2011 period was salmon with an increase in quantities and values of more than 10%. This variation was amplified due to prices of salmon which decreased by 2.5% in the same period (ISMEA 2013). Further, the consumption of trout increased 2011/2012 after a strong negative performance in 2011/2010. Frozen cod and hake fillets showed a strong positive trend that could be due to the fact that Italians consume more and more frozen and cheaper species such as cod and hake. Among the frozen category, fish sticks also showed a positive performance in both periods.

To summarize, secondary data shows a general decrease in fresh fish consumption until 2013 with the exception of salmon. Consumption of cod and hake, especially frozen, is expected to increase, but the consumption of sea bass and sea bream to remain stable.

1.1.5 Spain

Spain is one of the largest markets for fish and seafood in Europe due to their overall production capacity but also for consumption reasons. Spanish consumers greatly appreciate fish and shellfish, being the second largest country in consumption per capita along Europe.

In 2013, the fish and seafood consumption in Spanish households increased by 1.8%, with an average volume of 26.8 kg per capita, reaching a record level. Since then, the domestic household consumption decreased to 25.9 kg per capita in 2015, a 2.4% decrease compared to 2014 with a stable overall value due to a 2.7% price increase (achieving 7.76 €/Kg of average price).

Approximately 60% of fish and seafood volume consumed in Spain happens at home. In terms of domestic expenditures in seafood products, the households allocate the 13.4% of their total budget for food and drinks to this category, expending an average of 201€ by family member yearly. Christmas time is still the season of the year when they increase the volume and value of their purchases (MAGRAMA, 2016).

Fresh fish products represented 45% of consumed kilos by households (11.64 kg per capita), followed by 17.3% shellfish, molluscs and crustacean (6.96 kg per capita). Canned and frozen fish achieved 4.47 and 2.82 kg per capita respectively. The comparison between 2014 and 2015 in relation to the seafood consumption arises the decrease of seafood supply, highlighting a negative elasticity price-supply for fresh fish and frozen shellfishes/molluscs. In general, only the canned products obtained positive results in terms of volume and value between 2014 and 2015 (Table 1).

Table 1. Inter-annual difference of the categories of seafood products, 2014-2015.

	Value	Volume
Fresh fish	1.2%	-1.8%
Frozen fish	-1.6%	-6.4%
Frozen shellfishes/molluscs	1.9%	-3.3%
Fresh shellfishes/molluscs	-2.7%	-4.7%
Boiled shellfishes/molluscs	-3.4%	-5.6%
Fish and molluscs canned	1.2%	1.8%

Source: MAGRAMA, 2016

The household profile of the fresh fish consumers was mainly composed by retired people (30.1%) followed by adult couples without children (15.9%). On contrary, only 1.6% of independent young people household purchased fresh fish. In the case of frozen products, the most common household profile was represented by households with children (age of 6-15) and families with more than four members (MAGRAMA, 2016).

2 Methods

2.1 Study design

The implementation of the qualitative task and harmonisation of data across the five European markets (France, Germany, UK, Spain and Italy) was discussed during a WP 4 Meeting in Paris September 2015. A recruitment and interview guide was prepared by Matis in cooperation with University of Savoy, France and an experienced interviewer at Altimax, Annecy, France. For harmonisation purposes and to ensure common understanding of the aims and meaning of each question to be asked during the interviewing process, the interviewers from each of the five countries participated in a one-day work shop in Lyon, January 2016. During the workshop, the recruitment guide (Appendix 1) and interview guide (Appendix 2) were discussed and refined by participants, and the interviewers were trained by the experienced interviewer in using the guides. The interviewers from each country were from RTD PrimeFish partners. The following weeks, the recruitment and interview guides were translated in local languages by the interviewers, participants recruited and interviewed.

2.2 Questionnaire

At the beginning of the interviews, the respondents were informed of the procedure of the interview and a written consent from each respondent for using the results was obtained at the end of each interview. The interview guide was divided in to three main sections:

1) Context (40 min). This section included food in general, meals, food shopping and cooking and then food categories. The focus was placed on meat, fish and any substitute for fish and/or meat with regard to behaviour, key products for meals, overall image of the category, negative or positive press/information (media or friends/family), comparison of categories.

2) Fish, seafood and fishery products (40 min). This section included global perception and categorization, with regard to consumption, motives and barriers, purchase, storage, awareness and image of fish, finalised by a sorting task. The aim of the sorting task was to reveal how people differentiate between fish species; what species are similar/dissimilar and why they are considered similar/dissimilar. One of the main advantage of sorting tasks is that they are time efficient and even though they demand relatively little effort of the participant's behalf, results from sorting tasks are often comparable with more demanding methods (Abdi, Valentin, Chollet, & Chrea, 2007; Cartier et al., 2006; MacRae, Howgate, & Geelhoed, 1990). In addition, the sorting task gets people to think specifically about differences between species, which is one of the focus points in the study. Altogether 20 fish/seafood species consumed in the five target markets (trout, herring, salmon, sea bass, sea bream, cod, haddock, Alaska pollock/saithe/coalfish/coley, monkfish, tuna, mackerel, sole, sardine, halibut, plaice, hake/burbot/freshwater ling, whiting, seabastes/ocean perth/redfish, catfish, pangasius) with the possibility to add up to three more per target market if relevant.

3) Focus on fish species (trout, herring, salmon, seabass, seabream, cod) (40 min). This part of the study included exploration of several aspects of shopping and consumption behaviour for each of the focus species.

2.3 Recruitment and sample

For cross-country comparisons, it was aimed at similar demographical characteristics in each country (not random samples), due to the small size of the samples in each country (as done in Gatley, Caraher, & Lang, 2014). The literature provides reasons for striving to achieve similar samples in the countries in terms of age (Olsen, 2003; Verbeke, Sioen, Brunsø, De Henauw, & Van Camp, 2007), gender (Cardoso, Lourenço, Costa, Gonçalves, & Nunes, 2013), living location (coastal/Inland) (Cardoso et al., 2013; Trondsen, Braaten, Lund, & Eggen, 2004), and fish consumption level (Brunso, Verbeke, Olsen, & Jeppesen, 2009), since all those variables affect fish consumption (Table 2). In each of the five countries, the subjects were recruited using recruiting agencies or via snow-ball recruitment following a recruitment guide (Appendix 1). For participation, subjects received an incentive of 50 €/person.

Table 2. Quota based on demographic characteristics of subjects for interviews in each of the five target markets

18 interviews	Coastal* (9 interviews)		Inland* (9 interviews)	
Gender	Male (3 itws)	Female (6 itws)	Male (3 itws)	Female (6 itws)
Age 1 (18-30)	1	2	1	2
Age 2 (31-55)	1	2	1	2
Age 3 (56 – 75)	1	2	1	2
Freq 1** (Low fish cons.)	3		3	
Freq 2** (Average fish cons.)	6		6	
Freq 3** (High fish cons.)				

***Coastal: within 30 min drive from coast**

****Definition of heavy/average/light frequency of fish consumption is based on YOUR knowledge of the market, on local considerations (based on times per week). For example France : 2-3 times a week / 1 time a week or every 2 weeks / 1 time a month or every 2 months**

2.3.1 French subject description

Four locations were selected for the interviews in France: 1) Inland – Chambéry, Aix-les-Bains, Annecy (small cities), 2) Inland – Lyon (big city), 3) South Coastal – Marseille (big city) and 4) North Coastal – Quimper (average size city). Balance was sought in the three criteria by location: gender, age and frequency of fish consumption. As people living in Inland areas and people living in coastal areas have a different perception about the definition of frequent fish consumption, further categorization of frequencies was needed; Inland: Heavy consumers = 2-3 times a week or more frequently; Average consumers = 1-2 times a week; Light consumers = 1 time a week or less frequently; Coastal: Heavy consumers = 3-4 times a week or more frequently; Average consumers = 2-3 times a week; Light consumers = 1- (sometimes) 2 times a week or less frequently

Overall, the sample consisted of nine (three males, six females) inland and nine (three males, six females) coastal residents, equally distributed in the three age groups (six in age range 18-30, six in

age range 31-55 and six in 56-75) (Table 3). The education level varied from lower than high school degree (1), high school degree (1), bachelor's degree (9), master's degree (4) to PhD degree (3). Of the 18 respondents, five were studying, one worked part time, three were retired and nine worked full time.

Table 3. Profile of the French sample

N° subject	Gender	Location	Age	Freq. of fish consumption
1	M	Inland	1	Low
2	F	Inland	3	Medium
3	M	Inland	3	High
4	F	Inland	2	Low
5	F	Inland	1	High
6	M	Inland	2	Medium
7	F	Inland	3	High
8	F	Inland	2	High
9	F	Inland	1	Low
10	F	S Coastal	3	Low
11	F	S Coastal	1	Medium
12	M	S Coastal	3	Medium
13	F	S Coastal	2	High
14	F	N Coastal	1	Medium
15	F	N Coastal	2	High
16	M	N Coastal	2	Low
17	F	N Coastal	3	Medium
18	M	N Coastal	1	Low

The definition of fish/seafood consumption frequency was different for Inland and coastal areas (Table 2). Generally, fish consumption was higher among the higher two age-clusters (6 heavy consumers) than the youngest (3 light consumers). All (18) subjects consumed fish at home and eight consume fish in restaurants as well. None of the subjects practiced fishing as a professional activity. However, in the coastal areas, especially north coastal, almost all respondents had family members or relatives which fished as a leisure activity.

Education and employment: Nine subjects hold a Bachelor's degree, four a Master's degree, three a Ph.D. degree and two less than a Bachelor's degree. 14/18 respondents were full-time employed or students (1 part-time employed) and three retired.

Household and income: Six out of 18 subjects lived alone, two are low consumers and three average consumers. Five live with roommate, thereof are three low consumers and two average. Fish consumption was generally higher among subjects living with families or partner. Two of the respondents had children in their households, - one was a heavy fish consumer and the other low consumer. Generally -, subjects with high fish consumption had high income per household (>3500 €),

while 5/6 low consumers had low income (<2000 €). All the respondents were at least partially responsible for food shopping and partially responsible for cooking.

Four persons were excluded from further interviews as they did not consume fish. All the non-consumers were below 55 years. The reasons cited for not consuming fish were either “Do not like the taste”, or “I’m vegetarian”. Of the four excluded participants, three lived with their family (parents) with average to high household income, but the fourth person lived alone with income lower than 2000 €. Education level varied from high school to Masters degree. Three were students, one part-time working.

2.3.2 German subject description

Gender and age-clusters were equally divided by location, but fish consumption frequency was generally higher among coastal respondents (5 high, 3, medium, 1 low) compared to inland (2 high, 4 medium, 3 low). Fish consumption frequency was higher among the higher age clusters than the youngest (Table 4). The minimum of cities for inland was archived, for coastal only Bremerhaven is represented, but some interviewed person come from Kiel, a city at the Baltic sea coast. Coastal was defined as residence within half hour drive from coast. Inland was Bremen (60 km from coast), Dresden (500 km from North or Baltic Sea coast).

Table 4. Profile of the German sample

N° subject	Gender	Location	Age-cluster	Freq. of fish consumption
1	Female	Inland	2	Medium
2	Female	Coastal	3	High
3	Male	Coastal	3	Medium
4	Female	Coastal	2	High
5	Male	Coastal	2	Medium
6	Female	Coastal	1	Low
7	Female	Coastal	3	High
8	Female	Coastal	2	High
9	Female	Coastal	1	High
10	Male	Inland	3	High
11	Female	Inland	1	Low
12	Male	Coastal	1	Medium
13	Female	Inland	1	Low
14	Female	Inland	2	Medium
15	Male	Inland	1	Medium
16	Female	Inland	3	High
17	Female	Inland	3	Low
18	Male	Inland	2	Medium

The profile of respondents varied on household size (2 single, 9 couple, 3 one child, 2 two children, single mother with 3 children, adult child with parents), incomes (3 high, 12 mean, 3 low), urban and rural location (14 urban, 4 rural).

Definition of frequency of consumption: High = 2-3 times a week; Average = weekly or slightly more; Low \leq weekly /3x month (not recruited: rarely \leq monthly and never).

Education and employment: Three had lower (CSE), three medium (GSE) and 12 high (FSE, university entrance degree) educational school level. The CSE respondents were two pensioners and one housewife (unemployed). The high education level respondents were a professor, a PhD student, a teacher and two students, one studied without degree, one serve and the rest have finished an apprenticeship.

Household and income: One respondent was living alone, one was living with roommates, nine together with partner or wife/husband and seven lived families with one or more children, one was single parent. Three respondents had a high household income (all have high school education), 12 have a medium income (most of them have a high educational level and 2 adults in the household), three had a low income.

No respondents were excluded from further interviews due to prior information in TTZ database, which already included information about consumption habits.

2.3.3 UK subject description

The sample was stratified according to age and location, having an equal representation of coastal and inland cases. However, coastal cases covered a larger number of locations than the sample of inland areas (mainly central Scotland). During sampling, an observation was made that upper age group consumers were more likely to consume fish/seafood more frequently. However, the cases covered, were chosen according to predefined criteria for frequency of consumption (i.e. 3 low, 6 medium/high regardless of age and gender), and therefore do not represent a general trend. And while the coastal cases showed an average higher consumption (only two cases of low frequency), this should not be interpreted straightforwardly as a trend as it was largely due to difficulties in recruiting interviewees with low fish consumption from those areas.

The majority of fish purchases occur in multiple retailers which had a similar selection of products regardless of location. Even residents of rural areas would drive to a nearest multiple retailer if there isn't any in their village. When it comes to fresh fish, the only significant channel, other than multiple retailers was fish mongers, especially mobile fish mongers (or "fish van") who supply their products mostly locally, along the coastline, but travel further in-land, as well as near the coast. Direct purchases from fishermen, fish markets, landing sites were not observed.

High fish consumption was defined as once or more than once a week, medium – once to twice a month, low – less than once a month.

Overall, the sample consisted of nine (three males, six females) inland and nine (three males, six females) coastal residents, equally distributed in the three age groups (six in age range 18-30, six in age range 31-55 and six in 56-75) (Table 5). The education level varied from secondary (7) to higher (11). Of the 18 respondents, three were studying, two were unemployed, seven working part time, two were retired and four working full time.

Table 5. Profile of the UK sample

N° subject	Gender	Location	Age	Freq. of fish consumption
1	F	Inland	2	High
2	F	Inland	2	High
3	F	Inland	1	Medium
4	M	Inland	2	High
5	M	Inland	1	Low
6	F	Inland	3	High
7	F	Inland	3	High
8	M	Inland	3	Low
9	F	Inland	1	Low
10	M	Coastal	1	High
11	F	Coastal	2	High
12	M	Coastal	3	Medium
13	F	Coastal	2	High
14	F	Coastal	1	Low
15	F	Coastal	1	High
16	M	Coastal	3	Medium
17	F	Coastal	3	Low
18	F	Coastal	3	High

Generally, fish consumption did not seem to depend on age. All (18) subjects consumed fish mostly at home. None of the respondents practiced fishing as a professional activity nor do their household members. Fish as a leisure activity was not practiced by the subjects.

Education and employment: Majority (11) of respondents hold a higher degree and seven secondary degree. Four subjects were self-employed or working full time, nine part-time, three unemployed and two retired.

Household and income: Five out of 18 respondents lived alone, three are low consumers and three high consumers. Five lived with roommate or partner, thereof are three high consumers and two average. Others were parts of three to four person households. Generally, subjects with high fish consumption had higher income per household. All the respondents were at least partially responsible for food shopping and partially responsible for cooking.

Non-consumers: Due to the nature of the sampling technique, only fish consumers were recruited and participated during the process of recruitment, however, a general observation regarding the reasons for a lack of fish consumption was unawareness/lack of consideration for fish products (e.g. established routine of buying meat), and when there is awareness, main barriers are taste, bones and price, as well as special diet e.g. vegetarianism.

2.3.4 Italian subject description

Due to high consumption of fish in Italy and after analysing the recruitment information, the criteria of high fish consumption was defined as consuming fish five times or more frequently per week. Average fish consumption was defined as 3-4 times a week, but low fish consumption was two times or less frequently per week.

Table 6 shows the profile of the Italian respondents. Nine were coastal and nine from inland regions. Six were low, eight were average and four were high frequency fish consumers. The distribution of the frequencies and candidates were well allocated by age clusters.

Table 6. Profile of the Italian sample

N° subject	Gender	Location	Age	Freq. of fish consumption
1	F	Inland	1	High
2	F	Inland	1	High
3	F	Inland	2	High
4	M	Coastal	1	Low
5	M	Coastal	1	Average
6	F	Coastal	1	High
7	M	Coastal	3	High
8	F	Coastal	1	Average
9	F	Coastal	3	High
10	F	Coastal	2	High
11	F	Coastal	2	Average
12	F	Coastal	3	High
13	M	Inland	1	Low
14	M	Inland	3	Average
15	F	Inland	3	Low
16	M	Inland	2	Low
17	F	Inland	3	High
18	F	Inland	2	Low

Education and employment: The level of education varied from primary school to university education. Professions were various, mixture of employee, managers, consultants, retired, housewives, bartender

etc. Nine were working fulltime, four were working part time, two were unemployed and one retired. Only one practice fish activity as hobby.

Household and income: Household size varied from living alone to five persons. Two households contained children, and three more adult children (offspring). Two had low income (<20.000€), 13 medium (20.000-50.000 €) and three high income (>50.000 €).

Six subjects were excluded from further interviews as they did not consume fish. The reasons cited for not consuming fish were either dislike of consistency, smell or other properties of the fish flesh. In one case, cooking was considered to be too complicated and time consuming. Fish was also found to be too expensive. Five of six were from inland areas, university education and full time employed. Children were not a part of any of the households.

2.3.5 Spanish subject description

Gender and age clusters were equally divided by location. The fish consumption frequency was defined as low (fish consumption 1 time per week or less seldom), medium (2-3 times per week) and high (almost every day or more frequently).

Overall, the sample consisted of nine (three males, six females) inland and nine (three males, six females) coastal residents, equally distributed in the three age groups (seven in age range 18-30, five in age range 31-55 and six in 56-75) (Table 7).

The majority (12) of the respondents consumed fish 2-3 times a week (medium frequency), five less seldom, and only one more frequently. Generally, fish consumption was higher among the higher in coastal area but not for the interviews selected. The seafood consumption, including the preference, was generally higher among older respondents.

Education and employment: The education level varied from low (5) to higher (9). Of the 18 subjects, six were working full time, four were working part time, four were retired, four unemployed.

Household and income was rather equally divided. Two of the 18 respondents lived alone. Six lived with roommate or partner, six in three person households and four respondents in four and five person households. Six had low, 10 had medium and two high income.

Non-consumer: None of the persons declared never to consume fish. This fact is aligned with current information on most of 90% of Spanish people eat seafood (MAGRAMA, 2016).

Table 7. Profile of the Spanish sample

N° subject	Gender	Location	Age	Freq. of fish consumption
1	F	Inland	1	Medium
2	M	Inland	3	Medium
3	F	Inland	3	Medium
4	M	Inland	1	Medium
5	F	Inland	2	Medium
6	F	Inland	1	High
7	M	Inland	2	Low
8	F	Inland	1	Low
9	F	Inland	3	Medium
10	M	Coastal	3	Medium
11	F	Coastal	2	Medium
12	F	Coastal	3	Medium
13	F	Coastal	1	Medium
14	M	Coastal	2	Medium
15	F	Coastal	3	Low
16	F	Coastal	1	Low
17	F	Coastal	2	Medium
18	M	Coastal	1	Low

2.4 Data collection and reporting

All interviews were recorded for data analysis. The interviewer analysed the interviews based on the audio files, pictures and their written notes during each interview. Short individual reports and compiled overall reports were prepared in English by each interviewer following templates jointly prepared by Matis, University of Savoy and other partners involved in the task (Appendix 3 and Appendix 4).

3 Results

3.1 France

3.1.1 General consumption

Eating and meal preparation habits

Typical week food consumption

(Interviewer comment: Generally, eating in France remains pretty structured, including three meals a day at 7-8, 12-13 and 19-20 o'clock with teatime for children and sometimes "goûter" for adults around 16-17 o'clock. Most meals are taken sitting in kitchen or dining room, but young people or people living alone may take the meal and watch TV/work at their laptops at the same time)

Among the French respondents, meals were most often consumed at home and made by one family member although the responsibility of cooking was partly shared. People living alone mostly consumed their meals alone (excepting meals with friends, restaurants etc.), while those with roommates most often dined together, and families always.

Lunch was mostly taken at home by respondents working or studying full time rather than at restaurant or at canteen. A few took lunch at canteen / company restaurant, brought their own meals from home to have in the office kitchen, or at a restaurant / fast-food / bakery close to the office. Those who worked or study either took their lunch with colleagues, or alone at home.

It was rather uncommon to have **starters**, very few had a starter for lunch or dinner. Starters were mainly composed of salad, raw vegetables, cold cuts and smoked fish. In winter soup was preferred as starter. Lunch and dinner **main courses** were quite different. The main course for lunch was mostly composed of meat or fish with vegetables and/or starches. The main course for dinner was lighter, fresh meat or fish replaced by cold cuts or canned/smoked fish. A few respondents do not have meat in the evening and two fish neither. During winter, the main course was hot but during summer, the main course could be cold, such as salad (composed of vegetables and cold cut or canned fish/smoked fish). **Deserts** were systematically presented for lunch and/or dinner; such as cheese or yoghurt or fruit or fruit compote or cake. Many respondents had a **snack**, mostly fruits or "le goûter" (light meal taken in the afternoon which fills in the meal gap between lunch at noon and dinner).

Young people and people with low income rarely went to **gastronomic restaurants** (6 -12 times per year) while people with higher income (>2500 euros) used restaurants more frequently, especially during the weekend (once a week). Fish was seldom had in inland restaurants but very frequently in coastal areas. *(interviewer comment: Some fish restaurant chains are developing in France in commercial centers / malls (i.e.: La Criée)*

Half of the young respondents used **fast food restaurant** at least twice per month while older people never or rarely visit fast food restaurant. *(interviewer comment: Turkish/Chinese fast foods were increasing especially in urban areas, while McDonald's and Quick (hamburgers rather than fish nuggets/sticks) were still the leading fast food chains).*

Home delivery of meals was rarely used but mostly by younger respondents living in urban areas. Pizza was the most popular home delivered dish but very rarely sushi and burgers.

Almost all respondents considered the health side of the food very important. Majority also associated food with pleasure and health at the same time while a few were more concerned about the utilitarian value of the food than about the pleasure that it brings. Respondents living with families associated food with friendliness, and friendly atmosphere. Being a gourmand was frequently perceived as a cultural feature.

Cooking and meal preparation (food in general)

(Interviewer comment: Cooking tradition remains high in France, recipes are learned from generation to generation and in the household, women are more involved in meal preparation and cooking than men. Local culinary traditions remain high and differ by regions; In the Brittany / Mediterranean region, fish and seafood, In the north part, mussels; and in the mountain area, lake and river fish. The use of raw products (fresh or frozen) tends to decrease in French households, while the use of raw ready to cook meals and ready to eat tends to increase. Home equipment for cooking are rather standard; stove plates and usually oven, microwave oven, refrigerator and usually freezer. There is a trend towards open kitchen in France. Cooking programmes on TV are common in France, e.g. Topchef, Carnet de Julie and Meilleur pâtissier monde.)

All respondents were at least partially responsible for cooking and meal preparation. Those living with roommates were most often partially responsible for cooking and meal preparation and majority of respondents with families were responsible for all food cooking and meal preparation. Most people cook well-known recipes which need simple ingredients, rarely using a cooking book. Students searched for some simple recipes on the internet.

Generally, people from the higher age-cluster used a diverse methods of cooking (pan fried, baked/baked in a foil, boiled, steamed, barbeque etc.), whereas younger people mostly used a pan (for meat, fish and eggs) and a casserole (for starches and vegetables).

Generally, the respondents claimed taste and health benefits were the most important and that healthy food tasted good. Appearance of the food was less important, only when cooking for guests. The creativity was also frequently cited as important criteria.

Simple dishes were mostly preferred for weekdays. During the weekends, the dishes were more sophisticated (special dessert or something like this). Also, some people cook big dishes during the weekend and divide them into portions to be frozen and eaten lately. The food for guests/special occasions required more time, more complicated recipes are and the appearance was important. Generally, people living alone preferred to cook simple dishes, that don't demand a lot of effort and time but sometimes took ready to eat meals. People with higher income used fresh local products more frequently while people with lower income rather used frozen/canned products. Using ready to heat/eat products was infrequent (students mostly). Barbeque was very popular during the summer period, either for meat or fish.

Typical verbatim

"Between utilitarian and pleasure, mostly pleasure because I like to cook something good, but it's true it depends on periods" (France, inland, Male, 23 years, low fish consumption)

"The food is a pleasure, either because I like to cook for the others, or because I'm a terrible gourmand. It's a family pleasure, it's in my family's genes; we cook, we love to eat, we like to have a good wine...it's something quite cultural for us.

I always have in mind the idea of what I will cook tonight. I don't know how to explain this. There is always something planned, I know that I will associate such thing with such thing. It's like a reflex, it doesn't irk me. And I like to cook with the products I have at the moment, it's creative." (France, inland, Female, 61 years, medium fish consumption)

"The proteins are for lunch, meat or fish; it's difficult without meat or fish, the kids are hungry.

The role of the food is to bring the family together and it's a pleasure as well.

I try to make dishes that are healthy, not too fat, which are tasty, with fresh products. It's natural for me, I always did like this." (France, inland, Female, 46 years, low fish consumption)

"I like cooking, even if sometimes I force myself to do it. But I prefer to force myself than buying ready to eat products or going to fast food" (France, inland, Female, 28 years, high fish consumption)

"Regarding fast food, I prefer Turkish and Chinese fast food" (France, coastal, Female, 66 years, low fish consumption)

"Even if we buy processed food like raviolis or breaded fish, we always add something – a seasoning or a sauce" (France, coastal, female, 21 years, medium fish consumption)

"I don't buy processed food because I want to know what I'm eating. In winter I prefer to have a soup and a dessert for dinner. During the weekend I cook a large dish, after that I divide in portions that I freeze and during the week I eat my small portions" France, coastal, Female, 49, high fish consumption)

"I try to eat vegetables and starches, not only proteins. I don't buy fresh vegetables – only canned; they are less expensive" (France, coastal, Male, 20 years, medium fish consumption)

3.1.2 Shopping and food categories

Family shopping was most often done once a week at open market for fresh products and complementary shopping at the hyper/super/minimarket. However, students tended to shop more often at the super/minimarket.

Main substitutes for fish and meat

Among the French respondents, the main substitutes for fish were eggs, meat and starch/cereals. A few also mentioned legumes, cheese and soy/soy products. Main reason was content of animal proteins (eggs, meat, cheese) and healthy/light like fish (starches, soya). Five out of 18 subjects did not place fish and seafood in the same category. Two subjects were not able to find any substitute for fish.

The main substitutes for meat were fish/seafood, eggs and cheese. Very few subjects would replace meat by legumes, soy imitators or tofu, providing the explanation it was rich in proteins (non-animal) and good for health. Two subjects were not able to find any substitute for meat.

3.1.2.1 Fish shopping and consumption

Purchase

Mostly fish shopping was done at outside markets (*Interviewer: fishmonger and outside market are mostly perceived as the same place in France*) or fishmongers, which was most often related to quality, local origin, tradition or receiving advice. Many also use hyper or super markets due to convenience (all food products and household products at the same place) and price (not too expensive). Fewer used local grocery stores or minimarkets, but mention convenience (especially when living in the city center of a big city, close to home) as the main reason. Three respondents bought fish at Freeze centers (Picard, Toupargel, Thiriet) due to convenience (easy to storage) and price (not too expensive). Caterer-“Traiteur” was used by one subject due to convenience, and fisherman by one, due to quality and freshness.

Two mention shopping in organic grocery shops due to quality, ethic and traceability reasons, but raw fish is rarely found in this channel, mostly canned. Other two mention shopping at short circuit – local producers due to quality, local origin and helping small producers.

Different fish and seafood products (raw, fresh, whole or cut, fillets, cello wrapped, frozen or processed such as canned, smoked, roasted, breaded, spreadable paste, surimi) were available at Hyper-supermarkets, minimarkets, fishmonger, organic shops, producers, freeze centers, caterers and fishermen (Table 8).

Generally fresh fish was bought the same day it is consumed or maximum two days before. Therefore, the frequency of fish shopping depends on the frequency of fish consumption. If more portions/species were bought, one was consumed the same day but the other stored in the freezer. Contrarily, canned fish was bought mostly to have a stock of products to use any time. Smoked fish (salmon and trout) was not purchased very frequently, mostly for Christmas dinner (expensive).

Table 8. Overview of fish product range in different outlets in France

	Raw/ Fresh /Whole/ Cut/In filet	Cellophane wrapped	Transformed Prepared (ready to cook or ready to eat)	Smoked Dried	Frozen	Canned	Breaded
Hyper-super							
Minimarket							
Fishmonger							
Organic shop							
Producer							
Freeze center							
Caterer							
Fisherman							

Consumption

Fish was consumed at home as a part of main meals, - either lunch or dinner. It was consumed warm, with vegetables and/or starches, as a main course. When used as a starter, it was usually consumed cold (smoked, canned) with vegetables. Light fish consumers preferred to consume fish on Fridays or during weekends.

Generally, older respondents preferred fresh fish (fillets or whole). They consumed more smoked fish during Christmas and more canned fish during summer (for salads). Frozen and ready to eat products were rarely bought by this age category. Younger people prefer canned, smoked or frozen fish, mainly due to their low income and lack of knowledge and experience for buying fresh fish (especially whole). The majority of subjects did not buy surimi because they questioned the content.

Typical verbatims

"I hate shopping in hyper/supermarkets...and, on the other hand, I adore shopping at outside market. As we are living far away from the sea, the best fish suppliers are the hypermarkets, due to the frequency of delivery of products" (France, inland, Female, 61 years, medium fish consumption)

"We buy fish only at the outside market. I don't want to hear about hypermarkets in this case" (France, inland, Male, 58 years, high fish consumption)

"I buy fish and meat at the supermarket as well, less frequently, when I don't have time to go to the outside market. At the outside market I can ask some vendors' advices, but not at the supermarket" (France, inland, Female, 46 years, low fish consumption)

"I buy fish fillets at freezer centre or from fishmonger, I ask him to clean it as much as possible. For me it's painful and complicated to clean it" (France, costal, Female, 49 years, high fish consumption)

Key attributes for fish

Freshness was the most important quality attribute for fish, especially for fresh fish. Older subjects determine the fish freshness by its appearance (shiny skin, clear eyes) and smell (bad smell before and during the preparation). Another important attribute was the colour (salmon should not be too red/pink and the cod should be very white and not yellow).

Origin was important as well and the majority of respondents mention they preferred not to buy fish from far away/outside of Europe. Those living in the coastal area preferred local fish. Norwegian salmon was boycotted due to negative buzz.

Production method was also very important and majority preferred to buy wild fish (better taste, feed of farmed fish is not good), however, the choice was usually determined by the price (wild is always more expensive). A few respondents preferred farmed fish due to ocean pollution and/or overfishing. Because of negative buzz about farmed fish was important to know in what conditions the fish was

grown (farmed + bio is better). Brands and certifications for fish were not well known (not important when buying fish).

Communication with vendors was quite important for older respondents whereas younger preferred to buy fish already cello-wrapped. They liked to ask questions about the freshness, the fish supply, but also recommendations for cooking.

Typical verbatims

"I know that there are some stories about toxic fish which are sold very cheap; they are from China I think. For salmon, for example, I look at the package for having an idea if it's wild or intensively farmed. Generally, the salmon is imported from Norway or Scotland. I don't want to buy farmed fish, but neither do I want to pay twice more for the wild one." (France, inland, Male, 23 years, low fish consumption)

"I don't trust the labels because there are a lot of labels that have only marketing utility. They are not a choice criterion; they are not something serious" (France, inland, Male, 58 years, high fish consumption)

"I don't buy salmon that comes from Norway or Scotland, but only from Iceland. They have a rigorous concept about the quality of fish. I ate wild salmon in USA, it was very good – not like the salmon we have here" (France, coastal, Female, 66 years, low fish consumption)

"I prefer to buy farmed fish; it doesn't destroy the ecosystem. In the aquaculture sector we don't have stories about the damage of the seabed or about bycatch. The worst for me about the fishing is the bycatch – only 5% of the catching is commercialized. Also there are some articles on the internet about the tuna and its content of mercury. I never buy fish coming from Japan due to the nuclear accident. There is also negative information about the fished fish, but it's less dramatic than about fisheries" (France, coastal, Female, 21 years, medium fish consumption)

"Farmed salmon is better than wild; I trust that its quality is controlled and it has a better taste" (France, coastal, Male, 50 years, low fish consumption)

"I'm always worried about the product's freshness; I verify if the fabrication date is not changed on the etiquette" (France, coastal, Male, 20 years, low fish consumption)

Image of the food category

Generally, the respondents had a positive image about fish especially compared to meat, but sometimes complicated to verify the traceability of fish/fish products. Canteen fish was perceived as inferior to home cooked fish, with no taste and bad quality. Restaurant fish had a positive image, and it was perceived positive to have species people did not have at home. Wild fish had generally more positive image than farmed-fish. However, it appeared consumers were concerned by the origin of salmon. Labels or certifications were rarely mentioned or known, to the contrary of meat, where the Label Rouge was often mentioned as something reassuring.

When fish was compared to meat, both were perceived as source of protein in main course. However, fish was perceived as healthier, due to good fats, omega-3 and phosphor. Fish was rather mentioned by doctors (good for weight control), but perceived as less nourishing, less filling (reason for which children and teens don't like it much). More smell associated with fish when cooked, with more bones (frequently avoided in case of guests), more complicated to cook with short shelf life. **Compared to**

eggs, fish has wider range of recipes, was more nourishing, with no cholesterol and is healthier (good fats, omega-3, phosphor).

Generally, people rather tended to notice and remember negative information. The majority of information about fish, either positive or negative, comes from media, mainly TV, internet or magazines. Young people frequently saw small articles on internet (passive information).

(Interviewer: TV programs about the quality of products are very popular (e.g. On n'est plus des pigeons!). The idea of these programs is to show people why certain products are not good for health: methods of production, content of salt, bad ingredients (e.g. palm oil) etc. Frequently they analyze processed food like canned fish or breaded fish and advice people to not buy them because of preservatives.)

Documentaries on TV (e.g. We feed the world) focus on the environment and give the information that polluted water produces polluted fish.

Families and friends are a source of good information about fish. Kids were motivated to consume more fish because of proteins, omega-3 and phosphorus (good for memory).

Scandals about fish were mainly related to intensive farming (TV, internet, articles), contamination of salmon of antibiotics, fed with junk food (TV, internet, articles), overfishing, fishing in the deep-sea, mesh size of fishing net (TV, internet, articles), Intermarché bycatch (local activists in Marseille).

Campaigns or recommendations mentioned were: Eat local; eat seasonal products; Eat bio/organic; Eat varied; 5 fruit and vegetables a day (government campaign); Lower the consumption of animal proteins (less meat and/or fish); Not consume fish more frequently than 2 times per week (National Department of Health campaign); Nutritional information on packaging: information like “rich in omega-3” (for canned fish) or “contains 25% less salt” (for smoked fish) are appreciated by consumers. Crustaceans are very good for health but expensive.

Typical verbatims

“I think that fish contains some proteins that the meat doesn't have” (France, inland, Female, 46 years, low fish consumption)

“We are clearly emptying oceans of fish and I sometimes wonder if I should not stop eating fish” (France, inland, Female, 31 years, high fish consumptions)

“I boycott the fish from Intermarché (is the brand of a general commercial French supermarket) because I know that their methods of fishing damage the seabed” (France, coastal, Female, 21 years, medium fish consumption)

“I prefer to buy farmed fish, it doesn't destroy the ecosystem. In the aquaculture sector we don't have stories about the damage of the seabed or about bycatch. The worst for me about the fishing is the bycatch – only 5% of the catching is commercialized. Also there are some articles on the internet about the tuna and its content of mercury. I never buy fish coming from Japan due to the nuclear accident. There is also negative information about the famed fish, but it's less dramatic than about fisheries” (France, coastal, Female, 21 years, medium fish consumption)

“The global image about fish is mostly positive even if I heard some information about the content of heavy metals: I always know from where my fish comes; we are in a region which has a lot of fish; there is a dietician trend as well” (France, coastal, Female, 52 years, high fish consumption)

“The dieticians are saying that it is bad for health to eat too much meat and they are not saying this about fish” (France, coastal, Female, 52 years, high fish consumption)

“For fish, the negative information is about the ocean pollution. So, the fishes that come from the aquaculture sector – they are not polluted” (France, coastal, Male, 20 years, low fish consumption)

3.1.2.2 Meat shopping and consumption

Purchase

Generally, fresh meat was bought at the butchery or at hyper/supermarket. In hyper/supermarket older respondents preferred the butchery corner, but younger subjects preferred the section where the meat is already cello-wrapped. The cold cuts were usually bought at hyper/supermarket. Meat was also bought at minimarkets, outside markets, butchers or producers (from the countryside). Regarding charcuterie, older people generally bought cold cut directly from countryside producers. Young people frequently preferred ready to prepare chopped steak or cordon bleus because of convenience.

Consumption

Most often meat was consumed at home as main meals, and older people preferred not to consume meat during lunch. Meat was usually consumed warm as main course, accompanied with vegetables and/or starches; charcuterie was consumed accompanied with vegetables, as starter. The alternative to meat was fish (either fish or meat), sometimes eggs.

Key attributes for meat

The most important information related to meat was related to freshness. For most subjects, French origin of meat was important (not from Brazil or Argentine). Regarding charcuterie, the brand was a decision making factor. Colour of meat was the most important sensory attribute. Labels were important as well due to many scandals about violence against animals in slaughterhouses. Further, it was considered important for older people to be able to communicate with vendors (young people prefer to buy meat already cello-wrapped). As for fish a lot of information about meat was transmitted on TV. Young people frequently saw small articles on internet (passive information).

Typical verbatims

“Regarding meat and fish I buy at least European provenance, not from Asia. I try to pay attention at the European label or bio label; they are a criteria of quality” (France, coastal, Female, 21 years, medium fish consumption)

“I love very much the meat, but at the same time there is so much information about the quality of the meat in slaughterhouses. The animals are forced-feed and murdered in horrible ways. That’s why I prefer to buy meat at

the butchery and not the cheapest one in the supermarket” (France, coastal, Female, 21 years, medium fish consumption)

Image of the food category

Image was generally negative, especially compared to fish. However, it was considered necessary to eat meat (source of proteins) and it was more convenient to cook meat for guests than fish. Labels or certifications were very well known in the meat category. compared to fish, red meat was not considered to be very good for health, but generally meat was considered more nourishing / filling, easy to cook and store. White meat was considered tasteless.

The majority of information, both positive and negative about meat came from media, mainly TV, internet, magazine. As for fish, respondents tended to notice and remember negative information more. Scandals, such as violence against animals (TV, internet, articles), mad cow disease (TV, internet, articles), swine fever (TV, internet, articles) and Findus horse meat (local activists in Marseille) were mentioned. Campaigns or recommendations mentioned in relation to meat consumption were similar as for fish.

Typical verbatims

“We eat less meat after we have seen at the TV a reportage about the production of meat in Argentina. At the same time, we have so few trustworthy information sources” (France, inland, Female, 61 years, medium fish consumption)

3.1.2.3 Substitute shopping and consumption

Purchase

Eggs were generally bought at outside markets, hyper/supermarkets or organic food shops.

Consumption

Eggs could be a good substitute for meat or fish but not for a long time.

Key attributes

Label was very important for eggs and more than for other products (label rouge or Bleu Blanc Coeur). Generally, traceability of eggs is better than the traceability of meat or fish.

Image of the food category

There were no scandals about eggs. Eggs were easy to cook and convenient, but as well source of cholesterol with limited variety of preparation methods/cooking methods.

Typical verbatims

“The eggs can substitute the meat or fish but not for a long period because they have always the same taste and not a variety of cooking methods like meat or fish” (France, coastal, male, 20 years, low fish consumption)

3.1.3 Fish in general

3.1.3.1 Fish consumption

Subjects consuming fish frequently did not need a special occasion to consume fish, but those consuming fish less frequently preferred fish on weekends. Generally, the fish consumption increased during summer period.

All household members consumed fish, even though they did not like it, especially children. Generally, children disliked fish, mainly due to taste or bones. In one of the two families with children, fish was less frequently consumed due to children's disliking of fish. Women consumed fish more frequently than men, and in one case, the female did not buy freshwater fish due to her husband's disliking of such fish.

Typical verbatims

“The fact that my children dislike fish has influence on me; I would eat more fish if they didn't dislike fish” (France, inland, Female, 46 years, low fish consumption)

“My husband hates the odour of fish during the preparation; I cook the fish with open windows. We never cook some types of meals because it will smell too strong in the house. It's true that fish has the reputation of a stinky product, especially during the cooking” (France, inland, Female, 61 years, medium fish consumption)

Motives and barriers for fish consumption

Main **motives** for consuming fish was that it is perceived as healthy, good for weight control and good nutrients. It was considered simple, easy and convenient to prepare, offer variety in recipes and go well with a lot of foods.

Main **barriers** for fish consumption was price, bones and smell. Shelf life is short, and shorter than for meat. Negative press was also considered a barrier, such as bad image of farmed fish according to TV reports, animal welfare issues, overcrowded cages and bad feed containing antibiotics, especially for salmon and trout. Wild fish receives negative press as well, due to polluted oceans, bycatch and overfishing.

Effect of positive or negative press

One of the subjects was very impacted by the recommendation of his dietician and started to eat more fish and less meat in order to lose weight even if he doesn't like the taste of fish. Another respondent was very impacted by the negative information coming from the national Department of Health about the mercury content of fish and she reduced her consumption.

The majority noticed negative information about farmed fish on TV or on internet. Generally, this was related to farmed salmon from Norway or Scotland. Several consumers reduced consumption of

salmon while others did not change their consumption frequency but paid more attention when choosing fish, avoided certain provenances or bought farmed salmon with bio labels.

Typical verbatims

*“The information I see at the television impact directly my behaviour, but some information is not truthful”
(France, coastal, Female, 67 years, medium fish consumption)*

3.1.3.2 Buying fish

Place of purchase

Most preferred shops for fish purchase were fishmongers/outside markets due to good quality, local origin, vendor's advices or freshness; hyper/supermarkets due to choice range, convenience or frequency of supply; organic food shops due to good quality or certification of foods; and freezer centers due to convenience.

Least preferred shops for fish were online shopping and drive through, mainly because subjects wanted to see the fish before buying, to verify if it is fresh; and then minimarkets, due to poor supply or bad quality. Self-service was more used by young people but vendors by older people.

Type of products

Fish was most often bought fresh (no preservatives), cello wrapped (no preservatives), frozen (good quality, convenient), smoked (festive) or canned (convenient, cheap, easy to eat).

Fish was less frequently bought as surimi (bizarre content, preservatives, colorants), ready to eat/heat meals (preservatives), breaded (fat, bad quality fish).

Older people were not used to buy sushi (because of raw fish). Fish soup was also not a common purchase because of very strong taste.

Buying decisions

Generally, the decision to buy fish was made before going to the shop, but the fish species was not established until at place of purchase (depended on offers, price and promotion).

(Interviewer: In France we can very frequently hear at the radio advertising about fish promotions (attractive price) in large retails groups like Carrefour, Intermarché or E.Leclerc. The most frequently the fish species in promotions are cod, salmon and trout)

The most important criteria when buying fish was the freshness which was mentioned by all respondents, and not acceptable to buy fish if it was not fresh (bad smell or appearance). The second criteria was the price/promotion (especially for young people). And the third was the method of production. Majority of the subjects preferred wild fish, but if farmed fish was less expensive, farmed fish was accepted. The origin was mostly mentioned as being key criteria for salmon.

If fish was out of stock, it would be replaced by meat (source of animal protein) or fish would be bought at another location.

Typical verbatims

“As we are living far away from the sea, the best fish suppliers are the hypermarkets, due to the frequency of delivery of products” (France, inland, Female, 61 years, medium fish consumption)

“The decision to buy fish is made before arriving at the open market because the fish is not a product which can be stored for a long period and you need to know what and when you’ll cook. My purchase decision can be impacted by high prices; anyway I’ll buy some fish, but less” (France, inland, Male, 58 years, high fish consumption)

“I don’t buy breaded fish because we have fresh fish, I don’t want to buy small cubes that I don’t know what they contain” (France, coastal, Female, 52 years, high fish consumption)

3.1.3.3 Storage and preparation of fish

Fish was stored in the refrigerator if it is to be consumed the following day but in freezer if later.

Main preparation methods were pan which is considered simple, good preservation of taste and healthy in case sauce is not used. Sometimes, in order to be better accepted by children, it was accompanied with tomato sauce, creamy sauce or spices. Mainly used for white fish or salmon. Fish was also baked and considered healthy and was mainly used in case of preparation of white fish or salmon. Fish was also prepared in pies or pastas, mainly in case of salmon. Canned tuna, mackerel or sardines were often prepared as part of salad.

Typical verbatims

“The fish can be cooked very quickly, e.g. dab fillet you can cook it very simple in a pan with some butter and lemon and it’s delicious. You don’t need anything else” (France, inland, Male, 58 years, high fish consumption)

3.1.3.4 Knowledge of fish categories and species

Fish categories

Sorting task of focus species (the Primefish species) and other selected:

Haddock, Alaska Pollock/Saithe/Coalfish/Coley, Monkfish, Tuna, Mackerel, Sole, Sardine, Halibut, Plaice, Hake/burbot/freshwater ling, Whiting, Sebastes/Ocean Perth/Redfish, Catfish, Pangasius

Generally, respondents recognized most of the species (15-20), but older subjects tended to recognize more species, but least pangasius and sebastes. The subjects in the second age cluster recognized least

plaice, pangasius and seabastes. The least known species among the youngest age category were Seabastes, plaice and pangasius. Halibut and haddock were also among the less known species.

The spontaneous categories were most often related to product type (species usually bought whole (trout, sea bream), as fillets (seabaste), as canned (tuna, mackerel, sardine, herring), as smoked (trout, salmon, haddock, herring, halibut) or as salted (herring)); then by type of meals/fish (daily/ordinary (mostly canned fishes) vs exceptional/chic (monkfish, sea bass, sole, sea bream); price (expensive (sea bass, monkfish, sole, tuna, sea bream,) vs inexpensive (canned fishes like tuna, sardines and mackerel)); *Fat content* (fat (mackerel, sardine, salmon, tuna, herring, monkfish, halibut, cod, haddock) vs medium fat (cod, haddock, saithe) vs lean (sea bass, sea bream, trout); origin (fresh water (trout, salmon, herring, tuna) vs salt water; color (white fish (cod, saithe, whiting, hake; sea bream; monkfish; sea bass, hake) vs pink (trout, salmon, tuna) vs colored/blue (sardine, mackerel, herring); taste (strong (mackerel, herring, sardine, tuna) vs average (salmon, haddock) vs normal; availability (easy to find/common (whiting, hake, trout, sea bream, cod, tuna, herring, salmon, saithe, sea bass) vs difficult to find/exceptional (whiting, herring, monkfish); Smell (strong (mackerel, sardine, halibut, haddock) vs normal; *bones* (many bones (cod, catfish, sardine, sea bream) vs no bones (haddock); and shape (flat (plaice, sole, halibut, sea bream) vs normal.

Most respondents sorted cod, mackerel, tuna, trout, salmon as frequently consumed, and most respondents sorted seabaste, pangasius, plaice and catfish as never consumed.

Typical verbatims

“For me, the taste differences don’t exist; I couldn’t recognize the difference between hake and cod. I’m not very aware of the fish species; I can’t see the differences, except for the salmon. For example, if I want to cook fish with cream and curry, for me it’s not important if it is cod, whiting, coalfish or hake. It’s the same” (France, inland, Male, 23 years, low fish consumption)

“I like freshwater fish, but nowadays I can’t find a good trout. I keep in my memory the taste of the freshwater fish I ate in my childhood, it was really good and the trout had a very firm flesh. It’s not like that anymore, it’s an aquaculture product” (France, inland, Female, 61 years, medium fish consumption)

“The finesse of fish flavour is in correlation with the price: the finest are more expensive” (France, coastal, Female, 49 years, high fish consumption)

3.1.4 PrimeFish species

Trout

Trout was recognized by all respondents, although familiarity was generally rather low. Main associations were related to environment of the live trout (river, fresh water, lake, leisure fishing, farmed and nature), and then description of appearance (rainbow trout, salmon, grey skin, big, beautiful). A few associations with restaurant and preparation (smoked).

What respondents mainly liked about trout was taste, a few also mentioned texture, shape/appearance, and similarity to salmon. Three could not mention anything special they liked. Eight

could not mention anything they disliked about trout, but other respondents mentioned Industrial/farmed, seeing the head, bones, lake taste/flat taste.

Most respondents consumed trout a less frequently than once a month, but a several consumed it one time a month or more frequently. Several respondents considered their consumption constant, but a few decreased. Most commonly trout was bought as smoked fillets, whole raw or raw fillets and consumed at home in smoked form. Trout was usually bought at fishmongers or private source (if someone freshly smoke), and usually unplanned. Trout was most often consumed as everyday meals. Substitution for trout was salmon or smoked salmon or none.

Kids tended to not like trout because of bones. A few respondents mentioned buzz about bad farming process, regarding small cages, bad nourishment and paid more attention when buying.

Typical verbatims

“Less luxurious than the salmon” (France, inland, Female, 46 years, low fish consumption)

“Smoked trout has a better taste than smoked salmon” (France, coastal, Female, 21 years, medium fish consumption)

“I would prefer to buy it wild or with bio label because of all the negative information about aquaculture process” (France, costal, Female, 67 years, medium fish consumption)

Herring

Herring was recognised by all subjects although familiarity was generally very low. It was associated with strong smell, smoked, salted, fillets, salad, potatoes, marinade/pickled/rollmops, Scandinavian/Nordic, small fishes. Strong taste of herring was either liked or disliked.

Frequency of consumption was very low, most respondents consumed it only once up to a few times per year. Most considered their consumption of herring rare but stable. Herring was usually bought at hyper/super/minimarkets, consumed smoked, at home and rather in winter with potatoes, rather summer as barbeque. Sardines were mentioned as substitute for herring.

No buzz was mentioned about the species, although two mentioned they had heard it was good for health.

Typical verbatims

“Smoked herring reminds me the taste of smoked salmon; I appreciate this association” (France, inland, Male, 23 years, low fish consumption)

“I know that it's good for health but I can't eat it. Scandinavian people are so healthy because of eating herring” (France, coastal, Female, 66 years, low fish consumption)

Salmon

Salmon was recognised by all subjects and most were very or average familiar with the species. Salmon had many associations, related to origin (river, upstream, farmed, Norway wild), product and preparation (smoked, fillets, fresh), sensory attributes (pink, fat, tender/fine/melting flesh) and

occasions (celebration/festive/holiday/Christmas/New Year's eve). Most subjects liked salmon because of variety of recipes, taste, festive, cooking methods, raw/sushi, pleasant to eat, easy to cook, no bones, texture or color. Subjects mainly disliked it was farmed, too fat, too dry. Generally, everyone consumes salmon and kids really like salmon.

Salmon was rather frequently consumed, and most respondents consumed it once a month or more frequently. A few subjects considered their consumption of salmon was increasing, but more considered either stable or decreased. Salmon was usually purchased at hyper/supermarkets or at fishmongers for fresh fish, but smoked salmon at hyper/super/minimarkets, local producer or organic shops. Most bought salmon as raw fresh fillets and smoked, but a few bought it whole for Gravelax. Criteria for purchase was from Norway, wild, farmed, not too pink. Generally, salmon was consumed at home or restaurant, both as weekday and weekend meals. Substitute for salmon was trout.

Most subjects heard salmon was rich in omega-3 and good for health. Negative buzz related to salmon was mostly about farming process, Norway and Scotland provenance are mentioned as bad, bone meals.

Typical verbatims

"Sometimes the fish fillets are very red, I don't buy them. During the last years my consumption of salmon decreased because of production methods which are not very nice" (France, inland, Male, 58 years, high fish consumption)

"I like raw salmon, it has the taste of sea. It is quite fat, it is never dry when we cook it. It is bizarre for me when it is too red. The taste of salmon and trout are very similar, sometimes we are not able to say what is what" (France, inland, Female, 46 years, low fish consumption)

"The fact that I saw a report about the farmed salmon impacted my consumption; for a period I have reduced my salmon consumption and I started to look carefully their etiquettes" (France, inland, Female, 28 years, high fish consumption)

Sea bass

Sea bass was recognised by all subjects, but was familiar to very few. Sea bass was mainly associated with wild, lots of recipes, sea, festive or luxury and long/big. Most liked the taste or texture, but disliked only the price.

This species was not frequently consumed, most consumed it rarely/never up to a few times a year. Most considered their consumption stable.

Sea bass was mostly bought at fishmongers, whole or as fillets. Those who consumed it more frequently it was consumed at home (sometimes home cooked breaded for kids) but by others at restaurants or at family dinners. Everyone in household liked this fish.

This species has good reputation (no buzz).

Typical verbatims

"It is good, it has a lot of flavour, and the flesh is nice; I associate it with a special occasion meal" (France, inland, Female, 28 years, high fish consumption)

"I heard only positive information about this fish" (France, coastal, Female, 66 years, low fish consumption)

Sea bream

Sea bream was recognised by all subjects, but familiarity was generally average or low. It was associated with bones, flat, round, grilled/barbeque, summer, herbs, nice appearance/beautiful, fine taste/delicate and festive/luxurious. Subjects liked the taste and texture, but disliked bones. Frequency of consumption was usually a few times a year and more during summer period. Consumption of this species had remained stably by most respondents.

Sea bream was mostly bought at fishmongers, whole or as fillets but mostly consumed at restaurants. It was equally used during celebrations/family dinners and no special occasion.

No buzz about this species.

Typical verbatims

"It's difficult to remove its skin and bones. I think it's overfished at the moment because all the people don't want to consume tuna anymore, but sea bream" (France, coastal, Female, 66 years, low fish consumption)

"I don't buy it because it's too expensive, but I have never verified its price" (France, coastal, Female, 67 years, medium fish consumption)

Cod

Cod was recognised by all subjects, with average to low familiarity. Main associations were white, bouillon, fillets, sea, cheap/good value, good, breaded, natural taste, lemon, Portugal. The respondents liked the taste, texture, no strong smell, tender/smooth flesh and sweetness, but disliked smell and bones.

Cod was rather frequently consumed, most respondents consumed it once a month or more often. Most considered their consumption of cod stable or increased. Cod was mainly bought at Hyper/supermarkets as raw fillets, by a few as whole fish or frozen. It was prepared at home by most, during week days, considered to be too common for restaurant.

Main concerns were overfishing.

Typical verbatims

"We eat it most frequently because it's easy to cook. It's not fat like salmon or trout" (France, coastal, Female, 21 years, medium fish consumption)

"It's the fish species that I eat most frequently at a restaurant. I love the strong taste of morue" (France, coastal, Male, 56 years, medium fish consumption)

3.1.5 Perspective

Effect of interview on the participating subjects

High fish consumers claimed that the interview didn't change their perception about fish and fish species. People having a fish consumption restricted to a low number of fish species perceived that they never take the risk to buy and cook something new. Low fish consumers and young people said that this interview will at least determine them to diversify their fish consumption, to pay more attention when buying fish and also to increase their fish consumption.

Change in fish consumption during the last 5 years

The changes in fish consumption were related to the age of the consumers as most older participants claimed they increased the amount of fish intake while decreasing consumption of meat as fish is better for health, is lighter and more digestible. Fish consumption in the age group 31 to 55 years, was similar as before, either because their children do not like fish or because of high price and a bad supply of fresh fish in the mainland, or because they considered their fish consumption already high. Others in this same age group increased their fish consumption because of health reasons or because of a higher income. Half of the subjects in the youngest age group decreased their fish consumption because they are no longer living with their parents and they don't have the habit to buy/cook fish. Sharing the apartment with someone who doesn't like fish is a determinant of reducing the fish consumption as well. However, two of six not living with their parents increased their fish consumption as their parents did not like fish. The main reason for increasing fish consumption is not the household composition but the health benefits and taste preference.

Future fish consumption

None of the subjects expected they would to decrease their fish consumption in near future. Four mentioned they would maintain their consumption frequency mostly because of the bad buzz (content of mercury / recommendations from the National Department of Health), or overfishing.

The other 14 subjects would like to increase their fish consumption, and majority would like to reduce their consumption of meat at the same time due to health reason. Lower prices would be the main motivation to consume more fish. However, if the prices will decrease fast or too much it would create skepticism (questionable quality). The fish consumption is very discouraged by bad buzz (farming methods, mercury content etc.). Therefore, good information was considered motivate people to consume more fish. Young people would be motivated to eat more fish if having more information about the health benefits of fish, knowledge about how to buy, clean and cook the fish.

3.1.6 Overall conclusion

French people can be considered rather heavy fish consumers and fish is bought in almost all households. Further, knowledge of fish species is very brought, and the 18 subjects participating in this study recognized by name at least 15 fish species from the proposed 20 (salmon, trout, cod, herring, sea bass, sea bream, haddock, alaska pollock/saithe/coalfish/coley, monkfish, tuna, mackerel, sole, sardine, halibut, plaice, hake/burbot/freshwater ling, whiting, seabastes/ocean perth/redfish, catfish, pangasius).

The PrimeFish focus species were recognized by all. The subjects knowledge was more and broader for salmon and trout, while herring, sea bass and sea bream were less familiar. The lack of knowledge regarding sea bass and sea bream was mostly due to that those are high-end fish species (expensive) and therefore not accessible for frequent consumption; while the low consumption of herring is due to strong taste and smell (the price being affordable). The high familiarity of salmon and trout is due to the constantly increasing consumption of these fish species. This may also have resulted in it becoming less festive and less expensive than it was before. Another reason of being well-informed about salmon is the frequent circulation of negative information on TV or internet. The main subject of this information is the bad nourishment of farmed salmon in Norway (bad buzz about antibiotics, bone meals, colorants etc.). However, this information did not impact the general increasing consumption; people just pay more attention when buying salmon (provenance, method of production, labels etc.). Another reason for the increasing consumption of salmon is the increasing popularity of sushi (very developed in urban areas).

The consumption frequency of **trout** was occasional and the consumption frequency was stable or slightly increasing. It was mainly liked for its taste. Bones were the main barrier for its purchase. The most common product was smoked fillets. Salmon or smoked salmon were the major substitute products. **Herring** was very rarely consumed and most considered their consumption rare but stable. It was either liked or disliked for its strong taste. It was mainly consumed smoked and sardines were mentioned as substitute. **Salmon** was very popular, rather frequently consumed and liked for its various preparation possibilities and taste, but main dislikes were farmed and fat. It was usually purchased fresh or smoked. Substitute for salmon was trout. **Sea bass** was familiar to very few, was considered a luxury fish, liked for its taste and texture. Only the price was disliked. **Sea bream** was also not well known but liked for its taste and texture, but disliked for bones. It was more frequently consumed during summer period. It was equally used during celebrations/family dinners and no special occasion. **Cod** was rather well known and rather frequently consumed. It was liked for its taste and texture, but disliked for smell and bones. It was prepared at home by most, during week days, considered to be too common for restaurant. Main concerns were overfishing.

Generally, the intensive farming becomes a strong reason for not consuming fish, but the most important reason is the high price: “fish is more expensive than meat” – it’s a very common opinion/observation. For young people with low income, the second big barrier after the price is the lack of knowledge for buying and cooking fish (it seems to be much more complicated than cooking meat). However, the positive reasons push them to eat some fish at least monthly: a source of good fats, good for memory, lighter than meat etc.

Increasing the fish consumption is desirable by the majority of respondents; an important determinant would be the decrease of prices and complete information about traceability.

3.2 Germany

3.2.1 General consumption

Typical week food consumption

(Interviewer comment: Eating in Germany remains rather structured: breakfast 7-8h, lunch 11:30-13h, dinner or typically light evening meal 18-20h, in addition to teatime for children 15-16:30 h. Lunch or dinner in Germany during weekdays consists mostly only of one course (without starter or dessert) including a side order like noodles/ potatoes/ rice (starches) and vegetables and meat/fish/supplement or pasta with sauce (and vegetables/ salad)).

During weekdays, **dinner** was either light or warm meal. If lunch was a warm meal, dinner was lighter. Typical cold light evening meals in Germany mean one (or more) slice of bread with cold cut or cheese or fish products as topping sometimes with salad or pieces of raw vegetables or an egg sunny side up / smoked fish plate. Most of the respondents gave the impression that meal together with household members was important. At weekend, the timing of meals could be delayed, or priority of the meals change, e.g. due to more free time or because of leisure activities (eat out of home). Many of the respondents reduced the amount of meals from three to two, only one warm meal, either a late lunch (no dinner) or dinner. This could mean late comprehensive **breakfast/ brunch** (with bread rolls, smoked salmon, eggs), light **lunch** or only snacking (e.g. fruits/ ice cream), late lunch/early dinner in the afternoon or snack in the evening or dinner at 17-20h. In most cases the single persons ate alone and student sometimes together with roommates, friends or in the canteen, a few had all meals together but the majority took 1-2 meals per day together (sitting in kitchen or dining room). In some cases, younger people did not have breakfast. Lunch was taken either at home or out of home if respondent or partner were out for work/ kids in school. Lunch was taken in canteens (during work), as cold snack / fruits/ salad (during work) or brought from home to heat it up at work. Dinner or light evening meal may be skipped because of activities in the afternoon.

In all 18 cases, meals were home made by one family member (depending which partner takes the part of cooking / but normally not together).

If starter was used at lunch or dinner, it could either be served before or with the main course, such as salad or raw vegetables. Main course consisted of meat or fish or supplement with starches and vegetables). Deserts were often yoghurt, fruit or pudding, but uncommon during weekdays.

Restaurants were rarely visited, mainly occasionally during weekends, for special events (birthdays, Christmas, etc.), or for business. Fish was often proposed in restaurants menus (*interviewer: Bremerhaven has a lot of fish restaurants/ snack bars and are very popular among locals and tourists*).

Fast food was seldom used, only two of 18 respondents use home delivery services weekly, but pizza, sushi or Chinese could be bought monthly in urban and rural areas. **Snacking** such as fruits/vegetables/ salad or other (undefined) were mentioned as supplement for lunch weekdays at work/ without partner or weekend between extensive breakfast and late lunch/ dinner.

Role of food was mainly related to pleasure and taste, and health. Organic, fresh products and no ready-to-eat products were also mentioned. Seven mentioned specifically that food played an important role.

Cooking and meal preparation (food in general)

Majority of the German respondents prepared meals, a few prepared the meals together with their partner. In one case a male respondent was not responsible for preparing meals but his wife.

In most cases, a mixture of traditional and new recipes was used. Seven mentioned an international/ Mediterranean cuisine. Eight mentioned traditional recipes/ standard, or "home-made" cuisine, two vegetables rich cuisine and three advanced cuisine / hobby chef.

Very few, only two used delivery services, seven use ready-to-eat meals, nine use semi-processed food but four used only fresh products. Eight used mixture of fresh and semi-processed products because of reduced time during the week.

Most respondents considered taste and health as important factors when preparing meals during weekdays. Several found convenience or fastness of cooking important, a few mentioned freshness, appearance and satiation.

Several respondents had more complex meals on weekends. One considered weekend as time to eat meat but three fish. One considered weekend as time to be "unhealthy" and enjoy meals from delivery services.

Typical verbatims

"every day is Sunday" (Germany, Coastal, female, 67 years, high fish consumption)

3.2.2 Shopping and food categories

Main substitutes for meat and fish

Most of the respondents did not have a protein-rich alternative for warm meals, they would eat vegetarian dish. Several mentioned eggs as supplements, but would mainly consume boiled eggs at breakfast and vegetarian dishes (e.g. with cheese as a supplement). One mentioned veggie burger from unripe spelt grain as a meat/ burger supplement.

Fish and meat have different side orders, fish was rather served with rice and mash or salad, while meat was served with potatoes or noodles. Respondents found meat and fish to differ a lot in taste and consistency, as meat was more intensive, but fish was not comparable except tuna. Satiety and digestibility differed as fish was lighter, easier or better digestible and salubrious (except fatty fish). Meat (depends on preparation) was more indigestive and not as nutritious, but more satiating. Meat was less healthy (cardiovascular diseases, blood pressure, gout) vs. fish (omega-3 fatty acids). Fish was nice to prepare while meat preparation was dirty and smells. More negative press was related to meat products than fish products.

Typical verbatims

“could eat fish every day – meat not, too heavy on the stomach” (Germany, inland, female, 26 years, low fish consumption)

“Would supplement meat with fish but husband won’t” (Germany, coastal, female, 65 years, high fish consumption)

“eat meat because of the animalistic, bloody taste, the sociality and the nutritional value” (Germany, inland, female, 38 years, medium fish consumption)

3.2.2.1 Fish shopping and consumption

Purchase

Full-time employed respondents with families did shopping most often once a week in hyper or supermarket plus outside markets, but if necessary, complementing food shopping at the local grocery shop. Young people, couples, urbans or families with stay-at-home mom would do more frequent shopping because of less space and/or no car, in close supermarket /grocery or due to more time for shopping.

Fish for warm meals would most often be purchased at supermarket, frozen or vacuum packed. Other locations included hyper- and Supermarkets venders, discounter. Outside markets fish monger, fish monger and fish deli were popular among the respondents (*Interviewer: Typically for Bremerhaven, district with lot of fish mongers and fish industry, fish mongers with their own specialities (= delis)*).

A few respondents shopped for fish two times a week or more often, but most did so weekly and several less frequently.

Consumption

One respondent consumed fish monthly, but nine weekly, there of two during weekends. Others consumed fish 2-3 more frequently (include fish products (salads/ smoked), fish fillet/ warm meal weekend).

Key attributes for fish

Key attributes for fish shopping, were price (12), and sensory properties such as taste (10) and appearance (8) and freshness /storage (14). Eight mentioned origin or wild caught. A few also mentioned convenience, offers and experience of fish monger and species (no pangasius).

Typical verbatims

“Main criteria is freshness and taste, but difficult to get attractive range of fresh fish” (Germany, inland, male, 56 years, high fish consumption)

“2-3 times fish in a warm meal and additionally shrimps in the salad/ in summertime self-made smoking in the evening – directly consumed” (Germany, coastal, female, 26 years, high fish consumption)

Image of the food category

Overall, fish was considered healthy and could be used more frequently, freshly prepared, frozen is a compromise. It was generally considered to be something special where higher price had to be paid for better products.

Positive information about fish was first of all that it could be considered to be a meat supplement, a food category with short cool chain to table, fresh catch (fishing) and less negative than meat. Compared to meat it was considered healthier, contains omega-3, minerals, no carbohydrates, less calories and less cholesterol, positive effects on cardiovascular diseases and light compared to cheese and eggs. Fresh frozen fillet from trawlers were quality fish (less microbial contamination, long line, certificates). Herring leap in evolution, and breeding age earlier.

Main **negative information** was overfishing, cod population and never eat fish from Mediterranean Sea. Fish farms are not environmentally friendly. Additives, drugs related to pangasius were mentioned and respondents stated they would never buy it. Aquaculture environment was also mentioned related to pangasius. Other negative information related to catch included illegal fishing, fish mortality, sustainability, catching conditions of tuna, spiny dogfish and sharks. Negative evolution in both wild catch and aquaculture, related to pollution of the sea, aquaculture/industrial farming-bad conditions, was resulting in less healthy fish compared to before.

In addition, the respondents had heard negative news related to processing, such as fish waste, nematode problems (long ago), sushi as raw fish (would not eat). Short shelf life because of weak cold chain management.

3.2.2.2 Meat shopping and consumption

Purchase

Meat purchase was fairly evenly distributed between farmer, slaughter or organic slaughter, outside market (slaughter), supermarket, supermarket vender, hypermarket vender and discounter. Frequency of purchase varied from yearly purchase (from farmer, whole lamb and/or cattle – in pieces to freeze, for the whole year), to daily. Most respondents purchased meat 1-2 times a week. Meat products/cold cuts were most often bought at supermarket, then organic supermarkets, discounter, outside market or slaughter.

Meat consumption

Meat consumption varied from one time per week (mainly consumed during weekends) up to daily. Most respondents consumed meat 2-5 times a week. Consumption of cold cuts varied from never-rare to daily. Almost half the respondents consumed cold cuts daily.

Key attributes for meat

The most important information related to meat were sensory properties (taste, appearance, freshness), origin (slaughter/ farmer – trust), organic and fair animal husbandry, price, health, experience and convenience (ready-to-eat).

Image of the food category

Most mentioned that meat was a protein source, more often consumed in the evening (low carb, high protein for fitness). Availability of meat was good, the quality of meat is highly valued, but meat consumption should be reduced, but respondents found difficult to change eating habits. Meat consumption was related to pleasure, intensive taste, easy to prepare, special meals.

Positive information about meat include that variety is good, and good meat can be obtained from organic farmers (cooking with friends, something “good”, pleasure), organic breeding and short transport distances ensures good quality, regional suppliers, slaughters have a positive image.

With regard to **negative information** about meat, animal husbandry was mentioned by 11 of 18 respondents. Many mentioned poor animal welfare, respondents were skeptical about production conditions, slaughtering and animal mass farming and massive scale production. Breeding conditions and antibiotics, drugs in animal farming, contamination of meat were of concern as well as environmental issues and low wages. Cold cut and sausage products were linked to cheap production (discussion in the media). Respondents also mentioned it was not very healthy to consume too much meat and that more vegetarian food consumption was needed. Several scandals or bad news were mentioned, such as the BSE (mad cow disease) crisis, swine flu, bad reputation of beef offal, horse meat scandal, carcinogenic effects of meat consumption and diseases.

Typical verbatims

“hear about good breeding condition (of meat), has good feeling” (Germany, inland, male, 52 years medium fish consumption)

“annoying discussion with older male family members about the need of meat consumption (older males: humans need meat)” (Germany, inland, female, 25 years, low fish consumption)

3.2.2.3 Substitute shopping and consumption

Eggs were mentioned by a few respondents, used mainly as a part of breakfast. Veggie burgers (from unripe spelt grain) were used as weekly meat supplement by one respondent. Cheese was mentioned as substitute, used daily, e.g. in salad or on bread.

Key attributes

Many mention health and nutritional related issues (nutritional value, minerals, protein source), sensory properties (good taste and appearance, taste). Tradition (basic food, grow up with products).

Image of the food category

Animal husbandry, lactose intolerance problem pushed in the media. Increased number of vegetarians/ flexitarians in friend circles, resulted in more frequent consumption of fish and cheese instead of meat (better for environment). There is a need to change buying habits (with respect to husbandry conditions). Fish is healthier, substitute meat more than fish.

Typical verbatims

“today fish and meat products are not responsible, products too cheap supplied, do not raise the awareness of the public about the value of animal products” (Germany, inland, female, 25 years, low fish consumption)

3.2.3 Fish in general

3.2.3.1 Fish consumption

High fish consumption frequency was more than once a week but low fish consumption was considered to be 1-2 times per month or less. Fish was usually consumed as warm meal but consumption of cold fish products, on bread, salads was at least weakly. *(Interviewer: Respondents often forgot their fish product consumption (cold, on bread) when they evaluated their fish consumption frequency during recruitment and therefore, it is likely that the overall fish consumption frequency is on average higher than reported in the definition of high, medium and low fish consumption frequency).* Most participants considered themselves and household members average fish consumers.

The majority of the respondents consumed salmon, plaice, Alaska Pollock, cod and trout. A few mentioned redfish, zander, Lemon sole, herring, tuna and monkfish. Of other seafood, prawns or

shrimp and mussels were mentioned by the majority and calamari by a few. Of fish products, most participants mentioned smoked salmon and herring/matjes salad. A few mentioned smoked trout and canned herring. Smoked eel, mild salted herring, pickled herring, canned tuna and fish sticks were mentioned by a few.

Different type of fish products were consumed on week days and weekends. Seafood salads were rather consumed during week days but fillets and smoked products on special occasions (meals with friends, family, restaurant visit). During weekends fish was rather bought in outside markets and more time spent for meal preparation.

In 16 cases out of 18, all household members consumed fish, although in some cases, some household members preferred different fish and seafood species and products. In several cases, respondents made adaptations related to type of meals due to household members dislike of certain types of fish dishes (kids receive alternative dishes, fish not consumed at home due to fish dislike of other members, consumed when members that do not like fish are not at home).

All respondents consumed fish mainly at home, but many also consumed fish at restaurants. Smoked, canned and fish salads were commonly consumed cold for light evening meals (with bread) or weekend breakfast. Warm fish meals were common during weekends. Fish fillets or seafood could be consumed on special occasions, but fish sticks as something for every day meals. Three mentioned Friday as fish day.

Typical verbatims

"To little fish is consumed considering the good range of products offered in Bremerhaven" (Germany, coastal, male, 65 years, medium fish consumption)

"Fish fillets 2-3 times a week, not more frequently because of price" (Germany, costal, female, 26 years, high fish consumption)

"I like fish sticks but try to avoid frozen, processed fish because of ethical reasons" (Germany, inland, female, 25 years, low fish consumption)

"consume zander and monkfish and oyster and scallop less often than I would like to eat because so expensive/bad availability & would eat more North Sea shrimps salad if available in good (fresh) quality" (Germany, inland, female, 38 years, medium fish consumption)"

"Fish more spontaneously depending on appearance, North Sea shrimps directly from cutter, prawns something special for dinner with friends, wife takes care that organic products will be used and determines species because of restricted availability of different fish species of organic origin" (Germany, coastal, male, 35 years, medium fish consumption)

Motives and barriers for fish consumption

The majority of respondents mentioned taste as the main motive for fish consumption. Health and different nutritional motivated fish consumption (digestible, no antibiotics, good fatty acids, protein, mineral nutrients, low fat), as well as well-being (life quality, good feeling, not heavy as meat), supplement meat due to massive scale meat production, and routine.

The most common barriers to fish consumption were overfishing (threatened species), and conditions and bad reputation of aquaculture species (pangasius, breeding conditions) was mentioned by a few respondents as well as pollution (nanoplastis, heavy metals, Fukushima), nematodes and hygienic conditions in sushi, intolerance/allergies.

Poor availability (inland, fresh fish, good fishmongers) was likely to be a barrier for fish consumption as was price. A few respondents mentioned freshness and taste. Two respondents could not think of any barriers to fish consumption.

None of the mentioned barriers were of major influence but the respondents felt more strongly towards pangasius (consumption mostly never), shrimps from Asia, aquaculture condition (preferred to buy wild or organic produced salmon) and low availability of (some) fresh fish (more frozen and smoked products).

Effect of positive or negative press

Positive press was mainly related to aquaculture, where fish breeding/ aquaculture was positively presented, including plans to establish fish farms at the high-sea to overcome overfishing problems and with better husbandry conditions than in conventional aquaculture. Healthiness of fish was mentioned several times, including encouragement to eat fish, nutrients and source of protein. Norwegian fishery was considered comparatively better with more sustainable practice than other fisheries. Positive press about "Iglo" (German brand): freshly caught fish directly deep-frozen was also mentioned, in addition to nice fish cooking books and recipes.

Much of the negative press was also related to aquaculture, such as low quality of cultured fish compared to wild fish, bad breeding conditions. Pangasius was mentioned specifically in relation to bad press and respondents would not buy that. Wild fish was associated with bad press regarding plastic contaminants, heavy metals and overfishing. WWF/ German Society for Nature Conservation (NABU) was mentioned also, both in relation to wale fishing and by-catch. One respondent mentioned negative news from vegan/ vegetarian friends via claims about fishery at social media (Facebook).

Negative reputation of fish sticks as being "breaded fish waste" where fish is not visible. However, the respondents claimed this did not influence their consumption.

Typical verbatims

"better we are eating no fish, because nobody is knowing what comes next" (Germany, inland, female, 25 years, low fish consumption)

3.2.2.2 Buying fish

Place of purchase

Most respondents purchased fish at the supermarket, where the range of products was wide, from whole fish to fresh and frozen fillets, smoked, canned, semi processed and ready to cook or eat. Hypermarket, discounter, organic supermarket and fish deli were less used but still in several cases. Place of purchase depended on type of fish products and outside market, fishmonger and fish deli was mainly used to purchase raw whole or filleted fish. Producer was only mentioned by one respondent (semi processed fish), and freeze center was mentioned by one. Fast food for fish was not used by any of the respondents (Table 9).

Fresh fish products are bought at fish mongers by nine of 18 of the respondents, which is important with regard to freshness and need to see products and ask questions. Some respondents use self-service to buy frozen or vacuum packed if no fish vender in local supermarket. Others use supermarket/ discounter for weekly buying.

Most respondents never used online shopping for food nor discounters as they claimed it was not fresh. Several respondents did not use organic shops or deli because of price. Outside markets were not considered as fresh as fishmongers. A few remarks were also made on supermarkets, hypermarket and discounters due to lack of freshness, and freeze shops stored fish too long.

Table 9. Overview of fish product range in different outlets in Germany

	Raw / Fresh / Whole / Cut / In filet (vender)	Vacuum packed 4°C	Frozen (fish or seafood)	Smoked /Dried	Canned	Semi-processed (fish/ seafood salad)	Breaded/ a la bordelaise (frozen/ semi processed)	ready to cook or ready to eat
Hypermarket	3		2	2	2		1	
Supermarket	2	5	9	9	9	4 (1 Vender)	4	3
Discounter		2	2	2	4		3	1
Outside market	7							
Fishmonger	10			1		1		
Fish deli/ deli	6		1	3		1		
Organic supermarket	1		3	2	1			
Producer						1	1	
Freeze center		1 (SF)						
Fast food								

Type of products

Fresh fish and fresh fish products are mainly bought at fishmonger, frozen or vacuum packed at self-service. Frozen may also be bought at supermarket while smoked products from fish deli, as well as other delicatessen fish products. North Sea shrimps are bought directly from fisherman due to freshness. Fish salads can be bought from vender.

Majority consumed smoked fish, fresh and frozen fillets, canned fish and pickled/salted herring. Several also consumed breaded fish or fish sticks, vacuum packed seafood. Very few mentioned sushi, fish cakes and ready to eat meal.

Reasons given why products were not consumed were related to lack of freshness (surimi, vacuum packed or frozen), processing or ingredients (surimi, ready to eat meals, fish paste), sensory attributes (taste and texture of surimi, taste of canned fish).

Typical verbatims

“Buy mainly frozen fish (50% pure fillet e.g. salmon, 50% processed like “Schlemmerfilet”/ breaded), canned, smoked and ready to eat, and fresh fish: Processed fish/ frozen fish is easy to portion, fresh fish pure is nice if like to try new recipes” (Germany, coastal, female, 55 years, high fish consumption)

“spontaneous chef, like to be inspired by offerings, but nice presentation/ range of fresh is missing (in the district he lives/ not on the way)” (Germany, inland, male, 57 years, high fish consumption)

Buying decisions

Majority decided what to buy based on range of products and offer at vender. A few respondents claimed they made buying decisions mainly spontaneously, depending on freshness, appearance or offers of fresh fish, availability, season, price or mood. Many bought some products routinely, e.g. canned and processed, and other type of products more spontaneously, such as fresh fish and seafood, depending on promotion, reduced prices or by advice of fishmongers. Others planned fish purchase (fresh fish and standard frozen products) although they were occasionally inspired based on availability of the day.

Sensory related attributes were for almost all respondents important buying criteria, such as appearance, taste and freshness in general. Majority also mentioned certificates, label and origin as important buying criteria. MSC, frozen and packed products were mentioned in this context as well as organic. Wild was preferred to farmed and North Sea was preferred over fish from Asia. Brand name was for many important criteria, traceability (country origin), reputation and fish monger advice. A few of the respondents mentioned that the brand name was not a guarantee for taste, freshness or taste and they did not have enough information about the meaning of certificates. Additives (type and lack of) and price were mentioned by several respondents.

Several respondents mentioned bad reputation (pangasius and tilapia from Lake Victoria) as unacceptable when it came to fish purchase, as well as criteria related to origin (North Sea shrimps shelled in Africa, negative news about breeding conditions/species, not sustainable, factory farming aquaculture (Asia) and overfishing). Others mentioned fish mongers who fool consumer with special light but loss of hygienic conditions, cheap is bad quality, cut fillets enhance quality but produce fish waste, high processing, lack of traceability.

Substitution of fish

For substitution of warm fish meals, meat would generally be chosen for a nice weekend dinner, due to good filling component. A few mentioned white meat (chicken, turkey) or other fish or seafood products. Eggs and vegetables were also mentioned.

Fish products would mainly be substituted by (cream) cheese (on bread), vegetables, meat salad instead of fish salad or e.g. noodles with sauce, with meat products/ cold cut (instead of smoked fish).

Other substitution for fish and seafood were fruit, vegetables, nuts, milk products and e.g. soy products or different meals such as pizza or spaghetti Bolognese.

Main reasons for substitution were taste (must fit), appetite, freshness and healthy aspects

Typical verbatims

“very difficult to supplement fish, meat is not the same, you have to change side orders, vegetables, too, because has to fit together” (Germany, coastal, male, 28 years, low fish consumption)

3.2.2.3 Storage and preparation of fish

Packed (frozen/processed) fish or fish products was usually stored as bought (frozen, refrigerated) and fresh fish used same day or stored for maximum 1 day at 4°C. A few respondents stored packed products maximum three days at 4°C. Smoked fish was stored maximum 2-3 days in the fridge. Fresh seafood such as North Sea shrimp was directly prepared and consumed.

Whole fish or fillets, mainly salmon, trout, cod, lemon sole, Alaska Pollock or redfish, were most commonly fried in pan, or baked in oven, with or without oil and herbs, with side dishes as vegetables or salad and potatoes, noodles, rice or bread. It was also common to steam fish fillet on bed of vegetables, such as salmon on a bed of spinach, halibut with onions/ carrots/ spices and trout with spinach. Fish gratin is rather common (with orange/ lemon/ sour cream, tagliatelle, potatoes) as is pan meals (salmon sautéed with cream sauce and e.g. noodles/ rice/ potatoes) and fish soup. A few mentioned homemade breaded fish fillets and marinated grilled fillets or whole grilled fish, and sushi.

Shrimps are very common and are commonly fried or grilled (with garlic and oils/ baguette/ salad /white wine), or used in pasta for lunch or salad for cold light evening meal. Shrimps may also be marinated in butter/oil. Mussels can be cooked in white wine broth together with vegetables, calamari fried (freshly self-prepared) with salad and bread, or served in pasta sauce, or risotto with prawns and mussels.

Ready-to-eat fish products such as fish salad are often had with potatoes, on a slice of bread or just as fish salad. Canned or smoked fish is often consumed as it comes or on a slice of bread or with salad, or as side dish for warm meal (topping on soup/ potato cakes). Varieties such as fish sticks fried with mashed potatoes, hot smoked grilled salmon, canned tuna on pizza or smoked salmon and cheese in a wrap may be prepared as well.

3.3.2.4 Knowledge of fish categories and species

Fish categories

Sorting task of focus species (the Primefish species) and other selected

Six out of 18 recognized all of the 20 species listed, whiting was most often the fish not recognized.

Sorting on frequency of consumption, explanations

Alaska Pollock, salmon, trout and herring were most frequently consumed by most respondents, but plaice, redfish, tuna, cod, mackerel and halibut were also frequently consumed by some respondents. These species were mainly frequently chosen because of taste and because it was easy to prepare and consume at home.

Monkfish, sardines, sea bream, sea bass, sole, tuna and haddock were sometimes consumed by many, but trout, herring, plaice, redfish, cod, mackerel and halibut, hake and cat fish were also sometimes consumed by some respondents. These species were mainly sometimes chosen as it was found to be appropriate as restaurant fish and because of taste. Sea bass, sea bream and catfish might be more frequently chosen, but main hurdle was availability and price. Hake and sardine were found to be too fatty.

Cat fish, pangasius and whiting were rarely or never chosen by most and halibut, monkfish, sardine, sole, haddock and hake by some respondents. These species were mainly rarely or never chosen because it was unknown (whiting), had bad reputation (pangasius), came from Asia origin (pangasius). A few respondents mentioned they did not like the taste or texture (tuna, sardine, sole, plaice, hake, halibut, mackerel). Price was also mentioned as a hurdle (sea bass, sea bream, sole, monkfish) as well as availability (sea bass) and overfishing (redfish, sea bass etc.).

Sorting in categories, explanations

Categorizing could be association related to like/dislike, such as like to eat versus do not like; or sounds tasteful/ nice vs. sounds bad; tasteful vs. depending on preparation, dry or fat

Sorting was by few related to origin was done according to Atlantic sea versus Pacific sea/Med. Sea/ fresh water; or salt water/marine fish vs. fresh water vs not sure.

Sorting was also according to place of purchase such as knows from holiday at the coast or outside market vs. purchase in supermarket.

Sorting by products and preparation were several: in three groups of smoked vs. canned vs. fried; two groups of canned-smoked vs. fried-cooked (except pangasius, whiting); two groups of canned-cooked-smoked vs. fried (pure, breaded, egg-batter); two groups of fried vs. processed; three groups of fried fish vs Sunday-fish (tuna and marinated fish (herring).

One categorization was done according to digestibility/ salubriousness vs. lower digestibility/salubriousness (too fat: mackerel, halibut, herring, tuna, sardine).

3.2.4 PrimeFish species

Trout

Trout was recognized by all respondents, but less familiar to very few. Familiarity was more related to taste and experience rather than origin. Main associations were related to products (smoked, whole, trout fillets), origin (fresh water fish, rainbow trout, blue trout, trout ponds, river, fishing, typical inshore fish, typically fish for leisure activity fishers) preparation (bones, freshly consumed, trout Meuniere, wrapped in aluminum foil with herbs, oven baking) or sensory properties (tasteful, slightly moldy taste, silver, lively, crispy trout skin). One mentioned the poem "trout quintet".

What was mainly liked about trout was related to the flavor (mild, light, smoked) or texture (tender, light and lean and preparation methods (grilled, easy to prepare, eating size, preparation with melted butter and gentle white wine, taste together with herbs, flesh fall out from bones, easy to detach, fill and steam, marinate and grill on a stick, baking, whole fish freshly smoked, salubrious, eatable skin. Further, what respondents liked as well was that stocks were o.k., regional relation and availability. Main dislikes were related to bones or the appearance (eyes, dead animal, head and tail, the skin). Two disliked the taste (moldy, not fresh) and one found it boring.

Half of the respondents had trout monthly or more frequently. Generally, frequency of consumption remained stable during the last five years, although five claimed they consumed more (more fish in general, less meat, go fishing). Others had decreased their consumption, mainly due to poor availability, change in preferences, change in daily routine. Trout was consumed more frequently during summertime (seasonal) by most respondents. Several also mentioned special occasions (for holidays, at fish ponds, weekends and guests), and a few used trout for every day meals (if appetite on, light evening meal). In most cases, all household members consumed trout.

Many consumed smoked trout, often cold or on bread. Baked or whole grilled (in aluminum foil) was equally common, some mentioned fried fillets (with potatoes and butter). Blue trout (brewed in a stock with spices and vegetable and vinegar) or trout meuniere (with butter) were mentioned as well. Trout was most commonly consumed at home, but occasionally at restaurants. Place of purchase depended on type of product. Fresh fillets were obtained from fishmonger, whole could be directly from trout ponds, or fish monger, deli, hypermarket. Frozen fillets were obtained at supermarkets or discounters, but smoked from fishmonger, deli, supermarket, discounter, hypermarket, or from fish ponds, producer or private source. Purchase was usually planned. Main criteria for choice of purchase was freshness, appearance, appetite, size, expiration date (packed), location and weather for barbeque. Main substitution would be whole smoked mackerel or salmon, char, seabass, seabream or red mullet.

Regarding positive buzz about trout, four respondents mentioned good breeding practices, feeding with pellets, freshwater fish (overall available) and ecological better compared to other fish, indicator for good water quality. Majority did not remember any negative buzz about trout, but others found it negative it was cultured, use of additives and wrong feeding (antibiotics in ponds), ponds and overbreeding.

Herring

All respondents recognized herring. Most were well familiar with the species. Main associations were related to consumption of products (fried, marinated, salted, soured, herring salad, pickled, with bread rolls, bones, smell when cooking, barbeque), sensory properties (silver, smooth, sour, smoked, small,

intensive taste, salted, mild), or activities (typically North Sea holiday, childhood memories, origin (Russia, Baltic sea), health (omega-3 fatty acids).

What was mainly liked about herring was taste and texture (salty taste, taste if marinated, sour taste of "Rollmops", smooth bones, crispy fried, nice to sweet-sour food, piquant taste-almost a meat supplement), product or cooking related (fresh fried/grilled, diversity in preparation), uniqueness (sea fish with that certain something), memories (a bit of hometown, tradition, schooling fish). Some respondents could not find anything they disliked about herring. Others mainly mentioned small bones, smell if fried, slimy skin and fatty.

Majority of the German respondents consumed herring monthly or more often. It was seasonal for several respondents, more frequently consumed during summer, either fried or as salad.

Most commonly herring dishes were homemade as matjes salad in sauce, whole fried or grilled, lobscourse (a mash of: boiled potatoes, corned beef, bay leaves, onions, beetroot with pickled herring and egg sunny side up) or au gratin (with cheese inlayer with apple, potatoes and sour cream). For processed food (cold, light evening meals) canned, cold smoked, marinated, on bread, cold fried herring and marinated herring on a bread roll were mentioned in addition to "Rollmops" and ready-to-eat salads.

Herring was mainly consumed at home by most respondents, but a few mainly consumed herring at restaurants. Most respondents claimed their consumption of herring has remained stable the last five years. Two consumed more herring due to affordability and health aspects, but two decreased their consumption based on bones and availability of fresh herring.

Herring was by most prepared for light evening meals, spontaneously (if appetite), on special occasions (garden during summer, for events, visits, holidays) or every day or restaurant visits. In most cases, all members consumed herring. Ready-to-eat herring or matjes salad was bought either at fishmonger, fish deli or supermarket. Processed fillets (mild salted or pickled fillets) were bought at fish monger, vender, supermarket discounter. Canned herring was bought at supermarket or discounter, "Rollmops" were bought directly from manufacturer, fish deli or discounter at supermarkets. Marinated fried herring was bought at supermarket discounters, fresh fillet and whole herring was bought at fish mongers and cold-smoked "eel-style" herring at fish deli. Criteria for choice of purchase was most often based on brand name or label (MSC) and freshness (which was often based on trust in fishmonger), no or few additives, appearance, offer or appetite were also mentioned as criteria. Most (13/18) could not think of any substitution for herring because of its specialty ("matjes"), but others mentioned plaice, hot smoked salmon, trout, salmon or mackerel

Very few could think of buzz about herring. A few mentioned they found it positive that herring was not as overfished as years before, sustainable fishing, was healthy and that it was able to reproduce in younger ages. A few also mentioned as negative buss overfishing (in some regions) and nanoplastic and nematodes (years ago), but these did not influence their consumption.

Salmon

Salmon was recognized by all respondents and most were well familiar with the species. Main common associations were related to sensory aspects such as appearance, texture and taste (colour, strong taste, firm flesh), type of products or preparation (mainly smoked but also, versatile cooking, gravlax,

sushi, caviar, carpaccio, tartar, bread roll, salad, fried, baked), special occasions (luxury, Christmas), health (healthy, omega-3), but also tragic lifecycle (reproduction followed by death) or boring. What was mainly liked about salmon were sensory attributes (most respondents liked taste, then texture (consistency, tenderness of the flesh, not dry) and color or appearance. A few also mentioned health (omega-3, salubriousness) and less bones and versatility in preparation. Eight respondents could not think of anything they disliked about salmon, but a few mentioned dislike of sensory attributes (dry if overcooked, oil taste, too soft, tasteless, boring taste), aquaculture condition (badly managed, breeding conditions), dislike if lack of freshness, too many bones.

Half of the respondents consumed salmon and salmon products once a week or more frequently. Seven estimated their consumption of salmon to remain stable for the next five years, but most respondents expected their consumption of salmon to increase in coming years, mainly due to plans of overall increase in fish consumption, due to taste or health reasons. Only one expected a decrease (work related).

Salmon would be most commonly baked in oven or fried in pan. Several mentioned also smoked as topping, and a few mentioned grilled salmon (mainly summer), or for sushi. Eight consumed salmon mainly at home, but others both at home and at restaurants. Most had salmon for every day meals (easy to prepare), but a few mentioned weekend and dinner with guests. Salmon was consumed by all members of the household in most cases.

Frozen salmon fillets were most often bought at the supermarket, but also in organic shops. Fresh fillets were bought at fish mongers or at hypermarket vender. Vacuum packed fillet was bought in supermarket. Smoked salmon was bought at fish monger, or deli for special occasions or else in supermarkets and discounter. Gravlax and salmon salad were bought at supermarket, discounter or fish deli. Most often, purchase of salmon was planned on beforehand. Main criteria for choice of purchase were freshness and appearance. Origin was also important (wild, organic), certificate and brand were mentioned as well. Two respondent mentioned price or offer. In most cases, there were no substitutions for salmon (nothing compares to the taste of salmon, not for smoked salmon). Others mentioned Pollock, cod or plaice for fried fillets, trout (similar) or tuna (sushi).

Half of the respondents could not think of anything positive or negative buzz. Those who did mentioned health related information (omega-3, protein rich), good farming conditions (good conditions, control of water to number of fishes, improvements in integrative aquaculture), and certificates. Main negative buzz was also related to farming conditions (breeding conditions, additives, diseases, negative aquaculture in Norway, European aquaculture, cheaper means less quality, carnivore fish/feed with other fish), wild salmon overfished (parental animals in rivers are caught).

Sea bass

Sea bass was recognized by almost everyone, but most did not have any experience with the species. Those who had any experience with the species associated it with good taste, nice to prepare, holiday, Mediterranean cuisine and sea.

Main likes were related to sensory attributes (taste and texture), but dislikes were lack of availability (in Bremen), dark and bad experience of frozen fillets.

Frequency of consumption was 1-2 times a year or less (only four respondents had tasted Sea bass), prepared grilled or steamed, either at home or restaurant.

Occasions would be when offered in restaurant, with guests or when on holiday. Place of purchase was fish monger or restaurant, either planned or unplanned. Criteria of purchase would be offer and freshness. Most of those who had experience with Sea Bass would expect their consumption to be less frequent, due to fewer holidays in Southern Europe or availability. No substitution was mentioned for the species. Most would choose Pollock, plaice, haddock, mackerel or zander instead of Sea bass.

Sea bream

Sea bream was recognized by all respondents, although they were generally not very familiar with the species. Main associations were related to whole fish, preparation as grilled, occasion (summer, holiday fish, with guests, restaurant), origin (southern Europe, Mediterranean, Italian) and bones.

Main likes were sensory attributes (taste, consistency, appearance), something different, easy to handle, one fish one portion. Dislikes were mainly many bones, elaborate preparation and poor availability.

Nine of the respondents consumed Sea bream 1-5 times a year, but others less frequently. Most expected the consumption frequency to remain unchanged, but four expected it to decrease because of poor availability, better knowledge of other species or less frequent holidays in the south. The consumption was mainly seasonal, more during summer or during holidays in the South. Most respondents had the Sea bream grilled or baked (whole fish, Mediterranean style), or fillets fried on pan. Sea bream was mainly consumed at restaurants but also at home. Main occasions would be restaurant visits, barbeque and holidays and guests.

All members of the household consumed the species in most cases (not in four). The Sea bream was most often bought whole at fishmonger, vendor or supermarket, or restaurant. Fresh fillets were bought at fish monger, but frozen fillets at supermarket. The purchase was usually not planned, but the criteria of choice was mainly freshness and appearance, but a few mentioned price.

Four respondents bought plaice, pangasius or mackerel rather than sea bream as these species were less expensive. A few mentioned they would substitute Sea bream with trout (barbeque) or grilled hot-smoked salmon, mackerel, Sea bass, swordfish (grilled) or red mullet.

The respondents did not find any positive buzz about Seabream, but a few mentioned negative (Overfished, fished undersized, nanoplastics).

Cod

All respondents recognized cod and most were either medium or well familiar with the species. Main associations were related to sensory attributes (taste, white flesh, lean, firm), preparation (variety, cooked, steamed, fish cakes, fish sticks, easy to prepare), overfishing (threatened) and climate change. Main likes were related to sensory attributes (taste, white firm flesh, consistency, juicy), preparation (versatility, loin, easy fit) and health (lean, protein rich). Very few disliked anything about cod. A few respondents mentioned sensory attributes (fatty taste, not firm flesh, too lean), bones, boring, head and Baltic Sea environmental conditions.

Eight of the respondents consumed cod monthly or more frequently, but others less frequently. Most assumed their cod consumption would remain stable. Cod was mainly prepared as fillets, fried on pan (with or without batter), gratin or on vegetables in oven, or cooked. During summer it might be more often grilled or fried, but cooked during winter. Cod dishes would either be consumed at home or restaurants. Occasions would most often be special (Friday, Saturday, weekend, restaurant) but also general warm meals. In most cases, all household members consumed cod. In most cases fresh fillets or loins would be bought at fish monger, outside market, vender/ hypermarket. Whole cod was bought at fish monger but frozen fillets at supermarket. It could also be purchased at restaurant or caught (high-sea fishing).

Usually, the purchase was planned, but could as well be unplanned. Main criteria for purchase was freshness, appearance or related to certificates (MSC), origin or additives (fish sticks). A few of the respondents would buy monkfish, lemon sole, halibut, tuna, haddock or Pollock instead of cod, or substitute with hake, redfish, salmon, trout, place, monkfish, wolfish or zander.

Only a few could mention positive buzz about cod, mainly increase in population / stabilized. Very few mentioned any negative buzz about cod as well, mainly overfishing, nanoplastics, and Baltic Sea environmental conditions.

3.2.5 Perspective

Effect of interview on the participants

The interview made many aware that they need more information about breeding, fisheries and origin. The respondents also felt more aware of too low frequency of consumption and that they should change their way of consumption or purchase (e.g. buy more fresh than canned fish and more diversification, such as plan to eat sea bass and trout soon).

Others felt they were not influenced, mainly because of stable fish consumption, traditional eating habits.

Change in fish consumption during the last 5 years

Fish consumption of 50% of the respondents had increased during the last five years. The main reasons were a reduce in meat consumption (negative press chicken, pork), health reasons, more availability, influence of others in household, and price. The consumption had remained about the same among the other half (typical eating habits, is already high, similar availability of fish).

Most (10/18) expected their fish consumption to increase in next years, due to motivation to try more fish species, tasty fish, health reason, higher income and reduce in meat consumption. Others expected it to stay similar, due to stable eating habits, similar taste or because of fish stock and farming conditions. One expected it to decrease if price increased.

Future fish consumption

When asked what would increase their fish consumption, the respondents mentioned sustainability, most frequently (sustainable aquaculture, decrease in overfishing), no fish scandals, more meat scandals, increase availability and better range of fish species, including organic produced fish species and affordability.

3.2.6 Overall conclusion

From the interviews it was clear that some respondents underreported their fish consumption, as they did not always include consumption of certain types of fish products (e.g. fish salad).

Familiarity with fish was related to frequency of consumption and experience in preparation, but less the origin of the fish and diverse products.

Fresh fish was preferred but availability or ease of access was a hurdle. The main reason may be lack of time, as the respondents claimed they did not have the time to go where fresh fish was available (outside markets or local fish mongers). Therefore, more frozen and smoked products were consumed.

Information and news about both wild and farmed fish were received by the respondents. In several cases these were both positive and negative information about stocks (either improved, stabilized or overfishing) and farming conditions (responsible vs bad conditions). However, overall aquaculture has not a very good reputation, especially conventional and Asia aquaculture. Asia aquaculture is a No-Go in Germany, most of the interviewees rejected especially pangasius but also other fish and seafood (prawns) from Asian aquaculture.

However, increasing range of organic and sustainably produced fish has led to more positive experience of consuming fish via better conscience among some respondents. This is not least true for salmon where negative news regarding breeding conditions and feeding has resulted in that some respondents only eat wild or organic produced salmon.

Bones (especially small bones) are a barrier, especially in case of herring and sea bream. Smell is a barrier as well, especially fried herring. However, wholesomeness of fish is the main advantage of many fish species, mainly among females and older respondents. In addition, fish was generally perceived as saturating and good quality dish or take-away, although male respondents considered availability of fish as fast food to be insufficient.

Fried fish, oven and pan meals as well as grilled were popular preparation methods. Many liked semi-processed fish such as like canned fish (herring, tuna and anchovy), smoked fish (salmon and trout) and fish or seafood salads (herring/matjes salad, North Sea shrimps or shrimp salad) on a slice of bread (traditional German cold light evening meal) or with potatoes or soup as light lunch during the week.

The most popular species in terms of consumption were Alaska pollock, salmon, trout and herring followed by plaice, redfish, tuna and cod. This is mostly in accordance with the recent Norwegian study. Typical "restaurant" or "holiday" fish was sea bream and sea bass and sole and monkfish for special occasions, such as restaurant visits. Pangasius was rarely consumed, mainly because of its bad reputation.

The Primefish fish species were generally recognised by the respondents. The species were generally liked for taste and texture, but disliked for bones. Main concerns were related to overfishing, nanoplastics, and Baltic Sea environmental conditions, as well as farming conditions such as use of additives, antibiotics and overbreeding.

The consumption frequency of **trout** was once a month or more frequently among half of the respondents, had increased slightly. It was mainly liked for its flavour and texture and preparation methods, but main dislikes were bones. It was consumed more during summer, and more often for special occasions but also every day meals. Most popular was smoked trout or fresh baked or grilled. Main substitution would be whole smoked mackerel or salmon, char, seabass, seabream or red mullet. It had generally positive image, but a few mentioned use of additives, antibiotics in ponds and overbreeding. **Herring** was very well known and consumed at least monthly by majority of respondents. It was mainly liked for taste and texture, and only a few mentioned small bones (negative). It was seasonal for several respondents, more frequently consumed during summer, either fried or as salad, but had various preparation methods. It was mainly consumed at home but sometimes at restaurants. Most could not think of any substitution for herring because of its specialty (“matjes”), but others mentioned plaice, hot smoked salmon, trout, salmon or mackerel. **Salmon** was very well known and frequently consumed by many and liked for its taste and texture. Few disliked texture and aquaculture conditions. It was most often baked or fried or smoked. It was mainly used for everyday meals. Most recognised but did not have any experience with **Sea bass**. It was liked for taste but lack of availability was a main hurdle. Occasions would be when offered in restaurant, with guests or when on holiday. **Sea bream** was recognized by all respondents, although they were generally not very familiar with the species. Main associations were related to preparation and occasion (summer, holiday fish, with guests, restaurant). It was liked for taste, consistency, appearance, but bones were disliked as well as lack of availability. **Cod** was rather well known and liked for taste and texture mainly. Very few disliked anything about cod, mainly texture. It was generally consumed monthly or more frequently. Most assumed their cod consumption would remain stable. Cod was mainly prepared as fillets, fried on pan, either at home or restaurants, most often used during special occasions but also very day meals.

3.3 UK

3.3.1 General consumption

Eating and meal preparation habits

Typical week food consumption

In most cases there were three meals per day, breakfast, lunch, dinner. **Dinner** was the main meal of the day, the one which usually was shared by the family and typically the meal which was most likely to contain fish/seafood. **Lunch** may be left-overs from larger dinner (batch cooking) or specially

prepared and taken at work. However, a typical lunch (for working participants) was soup, sandwich or similar “light” meal. Most likely to contain fish here was salads with seafood, sandwiches with a fish spread (especially with tuna). **Breakfast** was usually small and simple, - cereals or fruits, yogurt. It rarely contained fish in the form of smoked products e.g. smoked salmon/trout, kippers. **Snacking** was not very common in the sample, more typical for respondents highly concerned with their health which would then involve healthy snacking e.g. fruits or cereals, but may on occasions contain ‘junk food’ e.g. crisps, toast. Snacking was unlikely to contain fish and was only encountered once in the form of sushi. Snacking was not common for high fish consumers except for one case where snacking of nuts or crisps was common.

Meals, especially those containing fish, were typically home cooked, more commonly by the wife/mother/female partner in the family, however, depending on the personal circumstances the husband could also have the main role in cooking. For those who worked or went to school, lunch was most often taken home-cooked (usually), packed lunch, and eaten in office/kitchen. Sometimes purchases were made from café/canteen at work/school.

Restaurants were rarely used, but then mostly during the week-end, or for special events (birthdays, Christmas, etc.).

Fast food was not very frequent for the respondents who consumed a lot of fish because they were usually concerned with their health and would try to avoid fast food (although in one of the cases, a high fish consumer would eat a lot of ‘junk food’ in between meals as well). Fast food was not frequented among older or rural respondents, but very frequent among younger and urban respondents and was increasing. In the cases of low fish consumers, fast food (especially fish and chips) could be the main source of fish consumption. Although most of the medium and high frequency fish consumers usually consumed home cooked food from scratch, occasionally (e.g. once a week) they bought a ready to eat meal or processed food for convenience. Fish and chips is the most important channel for fast food fish. (*Interviewer: Leaders are MacDo, Quick, many hamburgers, very few fish nuggets/sticks*). **Home delivery of meals** was not regular, encountered only in few cases and occasional.

In households with children the family would eat together at least once per day (dinner and breakfast usually). In single headed-households the person would usually eat on their own and sometimes with relatives/friends. In mature families who were still working, meals may not be shared all of the time (depending on the job shifts and lifestyle)

The main **role of food** was mentioned to be family time and health among subjects with families, but pleasure was also mentioned. Single headed households, especially higher age groups, would often cite mainly pleasure. Heavy fish consumers would often say taste/pleasure or health, and high frequency consumers of upper age groups would eat fish mainly for the taste/enjoyment. Younger educated people would be more concerned with health.

Cooking and meal preparation (food in general)



In families, either the husband or wife would cook, more often the wife. The food was most often home cooked from scratch with fresh or semi-processed ingredients, but with busier lifestyles the importance of ready to eat meals rises. Home cooking was usually not sophisticated, following simple recipes on the weekdays, but something more sophisticated on the weekends (for working people).

Convenience/fastness was a primary concern when it came to cooking, particularly with younger and busier people, older respondents (or unemployed) were more ready to spend more time on cooking and would enjoy it more.

Simple cooking methods were most common, and particularly the recipes that included fish/seafood, e.g. boiled pasta with ready or home-made sauce (typical for tuna, shrimp). Oven cooking was most preferred cooking method for fish, e.g. salmon, sea bass, cod, trout. Frying was also common, especially for white fish fillets and herring fillets. Oven fish was typically served with vegetables/rice/potatoes/salad. Cooking in microwave was not common, particularly for those concerned with health. Cooking fish at home was common only for very few species; salmon, cod, haddock, but others species were more commonly consumed out of home. However, with higher fish consumers the species cooked at home were more diverse, nevertheless the recipes followed were still simple.

A combination of taste and health benefits was most commonly mentioned as important factors when preparing meals, as well as convenience/fastness - especially for working people. Appearance was important when where were children in the household.

Typical verbatims

“Presentation is important to an extent but only from the perspective of making sure it looks attractive enough for the kids to be interested in eating it!” (UK, Coastal, Female, 38 year, high fish consumption)

“Tend to cook what I know I like, when on a tight budget, it’s too much of a gamble to buy, prepare and cook something I may not enjoy” (UK-Coastal, male, 56 years, low fish consumption)

3.3.2 Shopping and food categories

Main substitutes for meat and fish

Main substitutes for meat and fish were pasta, vegetables, quorn, eggs and cheese. These represented meals on their own even without containing fish or meat, but quorn would be used as a direct substitute for meat.

3.3.2.1 Fish shopping and consumption

Purchase

In all cases the main shopping was done in a super/hyper market, even if those were not available in the village, respondents would drive to there. Depending on which supermarkets were available in the vicinity, shopping would most commonly be done there, but in some cases (less affluent respondents) deliberate trips to discounter retailers were made. Discounters (e.g. Lidl, Aldi) were generally preferred by participants with low income. Usually, local grocery store would be used for 'topping-up' in between main shoppings, or buying snacks.

Specialty shops were not common place of purchase. Fish not bought from a supermarket would be purchased from a fish van or a fish monger usually on a special occasion because of the perceived better quality and freshness of fish in those places (*Interviewer comment: Independent fish mongers and butchers in the UK used to be much more popular in the past, nowadays there are very few independent fishmongers left, as the advent of multiple retailers have largely displaced them. Fresh fish is now commonly bought from a fish counter in a major retailer. However, there are still vans distributing fresh fish to almost every village on a certain day of the week, and those are popular particularly with older people who are used to buying their fish from a fish monger or a van and have developed a trust relationship*).

Organic grocery shop or supermarket were not widely available in the areas where the interviews were conducted. However, participants concerned with ethical and health issues would mention those as sources from which they would like to purchase. No fish was purchased from this channel.

Outside markets were insignificant because of their unavailability. Short circuit – Local producers: Insignificant in the sample (but see fish vans), freeze centre were not popular and not a preferred place of purchase and Deli was rarely visited by the people interviewed

The majority of respondents would pick fish products from the shelves of a retailer because fish counters with a vendor were not available or because they did not have the habit of buying from there, also because of perceived convenience and fastness – no queues. However, frequent fish consumers and upper age group respondents would also buy from the counter as they would like to chat or ask for information. Generally high frequency fish consumers were those seeking most information.

The most common form of product was canned (tuna/mackerel), fresh fillet vacuum packed or cello wrapped (for salmon and cod, haddock), natural or breaded fresh or frozen fillet (cod, haddock), processed/transformed – fish fingers and burgers (Table 10). Whole fresh fish at the one end and surimi at the other were not popular among most of the respondents. Whole fish would be purchased typically by older people who have experience in handling it.

Table 10. Overview of fish product range in different outlets in Germany

	Raw / Fresh / Whole/ Cut / In filet	Cellophane wrapped	Transformed Prepared (ready to cook or ready to eat)	Smoked	Frozen	Canned	Breaded
Hyper-super							
Local store							
Fishmonger							
Outdoor market							
Producer							
Freeze center							
Deli							
Fast food							

Consumption

Most often fish is consumed at home, during the main meals, particularly dinner. It is consumed warm, accompanied with vegetables/ rice/ potatoes, as a main course. Or cold when in salads such as tuna or seafood (shrimp) if eaten at lunch or smoked fillet e.g. breakfast. The alternative to fish is meat or vegetables (because of the lightness and health properties of fish).

Typical verbatim

“Price is the key deciding factor!” (UK-Coastal, Female, 38 years, high fish consumption)

“I prefer the fish counter as you can chat about what you are buying and choose the best option” (UK-Coastal, Female, 38 years, high fish consumption)

“We have a personal relationship with the fish van man – I have been buying from him for three years now” (UK-Coastal, Male, 58 years, medium fish consumption).

“If my husband and I cannot find fish, preferably fresh, we buy meat” (UK-Coastal, Female, 71 years, high fish consumption).

Key attributes for fish

Form of product is an important consideration as most of respondents would only buy fresh/frozen fillets of different species, but would never buy whole fish, surimi, soup and sushi. Information such as nutritional information on packaging was not popular among participants, nor was origin and none of the respondents would mind if the fish was imported although they may prefer local. Health was important, but mainly as a form of product (e.g. natural, no additives). Environment/ethics was considered important especially among younger and well educated people who were aware about fish stocks and methods of fishing. The Dolphin Friendly certification was the most commonly recognized one, rarely MSC was mentioned (in only one case). Generally, storage guidelines were not considered very important as most people would try and cook their fish as soon as possible, nor were cooking

guidelines, although interest was shown by a few of the respondents for more information on cooking of (especially untraditional) fish e.g. in the form of leaflets.

Price was a very important consideration for almost all of the respondents. Those who didn't consider price so important were usually not the affluent but those who had food satisfaction and enjoyment as a high priority. They would be able to pay more for a perceived better 'experience'. Brand was mentioned by a few as important, the participants who were not likely to experiment with new products and were looking for consistently high quality.

Certification was generally not important (only for educated people), apart from the organic and Fairtrade certification, almost only Dolphin friendly and Line and Pole would be recognized for tuna. Fishing vs aquaculture – generally wild sources were preferred to aquaculture species.

Freshness was important and that the products looks fresh, and there are no signs of spoilage.

Importance of communication at store/purchase was not considered important in the majority of cases, nor was TV or internet for this purpose.

Typical verbatims

"Price is important – how does it compare with a good steak or lamb chop" (UK-Coastal, Male, 56 years, medium fish consumption).

"I feel sad about animals because they are slaughtered for meat, but it is necessary for living. I don't feel the same for fish because they are less sentient but I am aware of overfishing and by-catch issues" (UK-Mainland, Female, 22 years, medium fish consumption)

"I would only buy wild fish, I know fish farms are bad" (UK-Costal, Male, 58 years, medium fish consumption).

"Animal welfare is crucial to me but there is a balance between head and heart in choosing what to eat " (UK-Mainland, Female, 40 year, high fish consumption)

Image of the food category

Fish was seen as healthy and something which people should eat more of but usually is consumed less often than meat because it is considered not as tasty and the price is higher. Contrary, meat was seen as tasty and cheap but not so healthy and especially not ethical (yet respondents would still buy it because of the need for protein and for enjoying the taste).

Overall, there was a very limited knowledge on fish farming vs fishing and what is better, but on the whole wild fish were preferred. In terms of ethics, on the whole fish was not seen as equal to animal because it is less sentient and cannot 'make your friend'. Furthermore, people had limited knowledge on sustainability so certification for fish in general was not so important, although it is becoming more so as younger people are becoming more involved and aware of issues with fish stocks and fish farming.

Regarding **negative information about fish**, intensive farming was mentioned a few occasions although on the whole the knowledge of participants was very limited when it came to aquaculture

and whether it was good or bad. **Positive information about fish** such as cod stocks recovery was mentioned as something positive by a few respondents, and all participants were aware and had heard (from everywhere) that fish was healthy to eat. In general, there was not much information participants were aware of from the media, much less than other food categories and there was very limited knowledge on campaigns / recommendations. In a couple of cases the consumption of seafood was influenced by celebrity chef TV shows and cooking course (upper age group, high consumers).

Typical verbatims

“Fish is healthy although fish such as fresh tuna contains high levels of mercury. However, fish does contain Omega which can be beneficial” (UK-Coastal, Female, 38 years, High fish consumption)

“I see meat as a staple food compared with fish which is something I make a conscious effort for health/ experimenting with cooking” (UK-Coastal, Male, 24 years, high fish consumption)

“I look at the fish in the supermarket and I think I should be buying this but I don’t” (UK-Coastal, Female, 57 years, low fish consumption).

3.3.2.2 Meat shopping and consumption

Purchase

In all cases the main shopping was done in a super/hyper market, even if those were not available in the village, respondents would drive to there. Depending on which supermarkets were available in the vicinity, shopping would most commonly be done there, but in some cases (less affluent respondents) deliberate trips to discounter retailers would be made. Discounters (e.g. Lidl, Aldi) were generally preferred by participants with lower income. Usually, local grocery store would be used for ‘topping-up’ in between main shopping, or buying snacks. Specialty shops were not common place of purchase. Most common product types were natural fresh cuts, minced meat and ham.

Key attributes for meat

Price was found of importance, but origin, brand, storage guidelines and cooking guidelines were generally not important. Freshness was considered important, the meat had to look fresh. Lean meats would be preferred by those concerned with health. Organic chicken was mentioned most often with regards to meat certification. Generally, communication at store during purchase was not of importance. Information sources (e.g. TV, internet) was relatively more important than for fish and the horse meat scandal was mentioned in relation to this.

Image of the food category

Meat was seen as tasty and cheap but not so healthy and especially not ethical (yet respondents would still buy it because of the need for protein and for enjoying the taste).

Typical verbatims

“Friends have encouraged me to eat more fish, media have promoted me to eat free range/ organic” (UK-Coastal, male, 24 years, high fish consumption)

“My body needs protein!” (UK-Mainland, female, 40 years, high fish consumption)

3.3.2.3 Substitute shopping and consumption

Purchase and consumption

The same pattern as for fish and meat.

Key attributes

Key attributes for substitutes were similar as for fish and meat, but generally, substitutes were seen as the healthiest and most sustainable option, and free range eggs would be preferred for ethical reasons.

3.3.3 Fish in general

3.3.3.1 Fish consumption

High fish consumption is more than once a week but low fish consumption is considered to be one time per month or less.

The most frequently used species were salmon, tuna, shrimp, cod, haddock, mackerel and sardines. Fish was everyday meal for most of the commonly consumed species, but other species may be only eaten at restaurants e.g. sea bass, trout or pangasius.

Children did not like all fish species consumed by respondents, especially species with strong fishy taste or with bones. Parents would try to make their children eat fish by giving them to try new species/products; if children (or one of the children) don't eat fish, in some cases parents would still cook the it because they do not want to spoil their children. When one member of the family is a heavy fish eater but the other is not, usually the other member increases his/her consumption rather than the other way round. However, if one of the partners is vegetarian, fish consumption may decrease.

Typical verbatims

“I think that fish consumption trends are very much a product of crowd mentality, if you see a brand you recognise one is more likely to purchase it” (UK-Coastal, male, 24 years, high fish consumption)

Motives and barriers for fish consumption

Main motives for fish consumption, was positive health effects (mentioned by all respondents) and good flavour (for most of them). Fish is low in calories so good for maintaining weight and almost all were aware of omega 3 fatty acids. Depending on the species and product seen as convenient and versatile (particularly salmon)

Main barriers were high price and the price is considered too high compared to meat. Some species such as herring, mackerel and sole were said to have too strong fishy smell which was also a problem for cooking. Too strong taste, of especially herring, but too weak taste, of especially cod. Bones were a problem for mostly younger people but older would also mention it. Unavailability was mentioned especially by older generations who were used to having a much more diverse choice of food available from more channels. Nowadays they are unable to find the products they have traditionally eaten in the past. Negative image for farmed fish may be a barrier sometimes, although generally that would not prevent consumption.

Typical verbatims

"Usually it is the adults in the family who eat fish – the kids are put off by the odour and texture" (UK-Coastal, male, 24 years, high fish consumption)

Effect of positive or negative press

Fish stocks were considered overfished. Many were aware but that would not impact on their consumption, only in one case of a passionate environmentalist, fish from unsustainable stocks would not be eaten. Negative environmental impact of catch e.g. dolphins (Dolphin Friendly label widely recognized for tuna). Fishing method was mention and Line and Pole tuna were preferred by those who were aware. The production methods in aquaculture were generally seen as negative because of "feeding with chemicals", overcrowding, sea lice. However, the respondents were not sure about the details.

Typical verbatims

"I am not sure if farmed fish is good or bad but I hope it is" (UK-Mainland, female, 40 years, high fish consumption)

3.3.3.2 Buying fish

Place of purchase

Most preferred place for purchasing fish was often mentioned to be fish monger (for the high frequency consumers) but in practice they shop from super/hyper markets and minimarkets because that is what is available to them. Some mentioned also that the most preferred purchase was direct

from fishermen but that was not possible, because they don't sell to consumers. Fish vans were also a favored because of the perceived better quality and freshness, even though the price was higher. Online purchase was generally not preferred because people would like to see what they are buying. Freezer centers were not favored.

Type of products

Fresh natural fillets were the most common among frequent fish consumers who cook at home. Frozen fillets as well as fresh would be preferred by medium to low frequency consumers. Canned fish was common, mainly because that is how tuna is marketed in the UK. Breaded/sticks is preferred by those looking for convenience and younger people. Smoked (salmon) is a favorite but the price is too high. Ready to eat/ prepared meals were not common among those who mostly cooked at home because of the perceived negative health attributes, but were common for the participants with busy lifestyle. Surimi, soup and dried were not known, although surimi would feature as 'crab sticks' but none of the respondents was aware of it.

Buying decisions

For most commonly consumed species decision was made in advance, but for other species (or those not commonly consumed by the respondent) it was influenced by the availability of promotion/price reduction. Appearance was usually considered important as it was a measure of freshness which is always important. For packaged products freshness was judged by the appearance of the product and by the use by date. Additives were important for those who are aware of them (concerned with health) and then avoided (e.g. products containing salt). Reputation was generally not important as the respondents were not aware of the producers and negative reputation, but some would trust certain brands. Price and promotion was very important, not always for those with lowest income but rather for the participants with medium income. Wild versus aquaculture was generally not an issue when it came to products. Traceability and origin was generally not important although there would be a common preference for local and caution when it came to products from far away. Certification and labels were important for tuna.

Seller or fishmonger advices were not important for buying decisions. Brand was important in a couple of cases for participants who had discovered a good product and seek consistency in quality.

Fish was most commonly substituted with meat or vegetarian dishes because of price and what would fit the intended recipe or the perceived similarity between fish and vegetables in terms of health benefits.

Typical verbatims

"I am not a fan of fish bones – it has put me off smoked mackerel for breakfast" (UK-Coastal, male, 56 years, medium fish consumption)

3.3.3.3 Storage and preparation of fish

Fresh products were usually stored in fridge until preparation but frozen if not prepared immediately. Frozen products were stored in fridge, canned in the cupboard.

Relatively simple recipes, that did not take too much time, were followed in most cases, typical for British cuisine. The most common method of preparation was in the oven (either fresh or frozen fillets, natural, breaded or dusted, in foil or not, followed by shallow frying and in fish pies. Sandwiches (tuna) and in salads was also popular (tuna, seafood).

3.3.3.4 Knowledge of fish categories and species

Fish categories

Scoring task of focus species (the Primefish species) and other selected

The species were groups according to familiarity (tried vs never tried or familiar vs not familiar); origin (marine vs freshwater), type of fish (finfish vs shellfish or Flat fish vs round fish vs shellfish); appearance (ugly vs beautiful) and consumption occasion (Sandwich vs restaurant vs home cooking).

High frequency consumers would normally be able to recognize more species than low frequency consumers. Salmon, mussels, shrimp, haddock, cod, tuna, was recognized in all cases although not always visually.

Sebaster, whiting, pangasius, halibut, whiting, hake, monkfish, catfish were never or rarely consumed as they were unavailable or very expensive. There was not a strong culture in consuming sea bass, sea bream, trout, herring, sardines and mackerel, but these species were sometimes consumed. The most commonly consumed fish species were tuna, salmon, cod, haddock and shrimp as these were widely available and easy to prepare.

3.3.4 PrimeFish species

Trout

Trout was recognized by most, although not necessarily visually. Majority was familiar with smoked trout but were not very familiar with fresh trout. Main associations were related to environment of the living trout (river), appearance (nice looking) and consumption (earthy taste). What was mainly liked about trout was appearance (colour) and good or light taste. Also that it could be fished in the river (no need to live on the coast) and eaten on the spot (BBQ). Other disliked taste, and a few mentioned moldy taste in that respect. Also that trout was not widely available (need to look for it,

not obvious as salmon). Almost all respondents mentioned bones in relation to what they disliked about trout and five mentioned that children did not like bones.

Generally, frequent consumers consumed trout a few times a year, it was not commonly consumed by other categories. Consumption frequency remained similar or decreased among respondents. Respondents were not very familiar with trout, it is not something participants would buy often to cook at home, usually eaten in a restaurant, rarely at home but then mainly during weekends. Whole fish was the most common form of recipes but smoked fillets was also mentioned. Trout would be bought at fish counter in supermarkets, shelves in supermarkets or at fish mongers. The purchase would be either planned or unplanned. For frequent consumers it would be planned. Criteria for choice of purchase would be freshness and price. Main substitute would be salmon.

Regarding buzz about trout, nothing negative could be mentioned although farmed was mentioned in a couple of cases (but respondents were not sure if that was positive or negative). The main positive buzz was that trout was rich in omega 3 but not as famous as salmon.

Herring

Herring was recognized by most respondents, although it was not familiar to them. Main associations were related to consumption (strong smell and taste, horrible, bones, delicacy). What respondents liked about herring was in particular forms, e.g. pickled (rollmops) and the taste, texture of herring, whereas others disliked the taste, in addition to smell and bones. Regarding consumption in household, the respondents claimed almost nobody liked it.

Consumption was very low, once-twice a year most often, and usually it was consumed cold (when pickled) or in oven or boiled when smoked (kippers). Herring was bought at supermarket and the purchase was planned. Criteria for choice of purchase was none as there are not too many products or varieties of herring. Main substitution was sardines (or nothing). No negative buzz was heard about herring, only positive, related to omega-3, oily fish.

Salmon

Salmon was recognized by and familiar to all respondents. Main associations were related to environment of live wild salmon (river), appearance (pink flesh) and consumption (tasty). Respondents mainly liked the taste, texture, versatility of cooking and ease of cooking salmon but disliked high price and farmed (when distinction was made between wild and farmed).

Frequency of consumption was high for frequent fish consumers and liked by everyone in the household. Generally, the consumption had remained the same or increased. Salmon was consumed either at home or restaurants, but every day meals and special occasions. Most commonly salmon was bought at supermarket or fishmonger, prepared usually as fillets, in the oven with lemon juice, served with garniture. Fresh filet or smoked most common. Main substitution was meat.

Not really any negative buzz about salmon, farming was mentioned but respondents were not really clear on if it was negative, but positive buzz was related to good for health, contains omega 3.

Sea bass

Sea bass was recognized by medium and high frequency consumers and the species was not so familiar. Main associations were restaurant, Mediterranean, travel, white flesh and delicacy. Respondents mainly liked the taste but disliked the price.

Consumption was not frequent, once or twice a year for those who consume regularly, but most had either never tried it, were unsure if they had tried it or had only tried in a restaurant when abroad. Consumption frequency had not changed, stayed non-frequent. Sea bass was mainly bought as filet or whole fish at supermarket or fish monger and baked in foil/paper, serve with potatoes/vegetables. Purchase was either planned or unplanned (when reduced price). Criteria for choice of purchase was price and availability. Main substitution was Sea bream.

Place of consumption was either home or restaurant, on special occasions for non-frequent consumers, but every day for some frequent ones. No buzz was mentioned about Sea bass, neither positive nor negative.

Sea bream

Sea bream was recognized only by frequent consumers and was not very familiar. Main associations were Mediterranean and tasty. Taste and texture was liked but no remarks were made about dislikes of Sea bream.

The consumption was low (as for sea bass) and had stayed the same. Place of purchase was restaurant, supermarket or fish monger. Sea bream was either prepared as filets or whole, in oven or shallow fry. Consumed at restaurant or at home, both for special and everyday occasions. Criteria for choice of purchase was form of product. Main substitution was Sea bass. No buzz was mentioned about Sea bream, neither positive nor negative.

Cod

Cod was recognized by all respondents, but not all visually, but was familiar to respondents. Main associations were related to product (Fish and ships) and appearance (white, flaky). Respondents mainly liked the taste and texture, but taste was also mentioned as what some disliked.

Frequency of consumption was around once a month, had stayed the same or declined somewhat. Cod was purchased at Fish and chip shop, supermarket, fish van or fish monger, consumed at restaurant or at home. Main criteria for choice of purchase was freshness. Bought as fresh or frozen fillets, prepared natural or battered in the oven, or fish and chips. Main substitution was haddock. No positive buzz was heard about cod, but concern was raised over declining cod stock.

Typical verbatims

"Instead of cod I would buy salmon, simply because if I wanted a tasty easy fish meal I would choose one of those" (UK-Coastal, male, 24 years, high fish consumption)

"Toddlers love cod!" (UK-Coastal, female, 33 years, high fish consumption)

3.3.5 Perspective

Effect of interview on the participating subjects

Asking about perception of fish and fish species usually made the participants think about their consumption more and increased their awareness about other species of fish they did not commonly consume.

Change in fish consumption during the last 5 years

The fish consumption had generally increased because fish has become more affordable. However, it had also increased or decreased because of change in food preferences (related to age). Consumption of e.g. fish and chips has decreased because of health reasons; some had tried to minimize fish consumption to move to vegetarian diet.

Future fish consumption

High consumers expected an increase in their fish consumption (usually they think their consumption is already high). This could be related to new recipes learned, or if fish becomes cheaper, trying to substitute meat with fish. Low consumers expected their consumption to stay the same. A decrease could occur related to respondents moving towards a vegetarian diet.

Respondents expected that lower prices, more knowledge about preparation of fish would increase their fish consumption.

3.3.6 Overall conclusion

On the whole, the results confirmed what was already known about the fish/seafood consumption in the UK. The variety of species consumed was not high and there was a general tendency to not experiment with fish/seafood as much as with vegetables and other key products. The cooking methods were limited to a few common recipes. In general, the 'food culture' is not sophisticated and often with little consideration for health, however health seemed to be becoming more important, especially among young, educated respondents. The main barriers to higher consumption were taste, bones, smell, price, awareness, limited knowledge, but interestingly availability was also mentioned, particularly by upper age groups, who would have preferred more fresh fish but are limited to what is available in supermarkets. The importance of the 'fish vans' for that particular group of customers was confirmed. Motives for fish consumption include the widely recognized, although not necessarily followed, health benefits of fish consumption, taste and convenience (especially for high fish consumers and upper age groups). Increasing the seafood consumption further would mainly require a more 'open-minded' attitude towards those products, more awareness and knowledge as well as lower prices.

The PrimeFish species were not all familiar to the UK respondents, but most of the respondents recognised them.

Majority was familiar with smoked **trout** but were not very familiar with fresh trout. Main associations were related to environment of the living trout (river), appearance and earthy taste. It was mainly liked for its colour, good and light taste and omega 3. Others disliked taste, and a few mentioned mouldy taste in that respect. It was not widely available (need to look for it, not obvious as salmon). Almost all respondents mentioned bones in relation to what they disliked about trout. Only frequent consumers consumed trout a few times a year, and consumption frequency remained similar or decreased among respondents. It was usually consumed in a restaurant, rarely at home but then mainly during weekends. **Herring** was generally not familiar, rarely consumed, once or twice a year most often. Pickled herring (rollmops) was liked and the taste and texture of herring whereas others disliked the taste, in addition to smell and bones. Regarding consumption in household, the respondents claimed almost nobody liked it. It was consumed cold (when pickled) or in oven or boiled when smoked (kippers). Main substitution was sardines (or nothing). No negative buzz was heard about herring, only positive, related to omega-3, oily fish. **Salmon** was recognized and familiar to all respondents. Main associations were related to environment of live wild salmon (river), appearance (pink flesh) and consumption (tasty). Respondents mainly liked the taste, texture, versatility of cooking and ease of cooking salmon but disliked high price and farmed (when distinction was made between wild and farmed). Frequency of consumption was high for frequent fish consumers and liked by everyone in the household. Generally, the consumption had remained the same or increased. Salmon was consumed either at home or restaurants, every day meals and special occasions. Not really any negative buzz about salmon, farming was mentioned but respondents were not really clear on if it was negative, but positive buzz was related to good for health, contains omega 3. **Sea bass** was recognized by medium and high frequency consumers and the species was not so familiar. Main associations were restaurant,

Mediterranean, travel, white flesh and delicacy. Respondents mainly liked the taste but disliked the price. Consumption was once or twice a year for those who consume regularly, but most had either never tried it. Criteria for choice of purchase was price and availability. Main substitution was Sea bream. No buzz was mentioned about Sea bass, neither positive nor negative. **Sea bream** was recognized only by frequent consumers and was not very familiar. Main associations were Mediterranean and tasty. Taste and texture was liked but no remarks were made about dislikes of Sea bream. Consumed at restaurant or at home, both for special and everyday occasions. Criteria for choice of purchase was form of product. Main substitution was Sea bass. No buzz was mentioned about Sea bream, neither positive nor negative. **Cod** was recognized by all respondents, but not all visually, but was familiar to respondents. Main associations were related to product (Fish and ships) and appearance (white, flaky). Respondents mainly liked the taste and texture, but taste was also mentioned as what some disliked. Frequency of consumption was around once a month, had stayed the same or declined somewhat. Main criteria for choice of purchase was freshness. Main substitution was haddock. No positive buzz was heard about cod, but concern was raised over declining cod stock.

3.4 Italy

3.4.1 General consumption

Eating and meal preparation habits

Typical weekly food consumption. Generally, three meals were consumed a day in Italy, around the same time (7-8h, 12-13h, 19-20h), only a few have only two meals a day (lunch and dinner). In most cases, meals were decided and made at home by one family member, the woman. However, the man and/or the family in general influenced and usually helped with shopping. Men, if they lived alone, prepared their meals and did the shopping. Working respondents usually had lunch at restaurant or similar, while those not working typically ate at home. Only a few prepared lunch at home and brought their meals to the work-place.

Most of the respondents usually used restaurants during weekends. Sushi restaurants were quite common for younger people (*interviewers comment: sushi restaurants are relatively new trend in Italy and all-you can-eat is becoming very popular as well, at least inland regions*).

Pasta or meat were usual for lunch, and light lunches for working people, but for dinner light food was usually preferred, for example fish or vegetables. Almost all consumed dinner at home (with family). For quite everyone, food had a utilitarian value and a nutrition value, many underlined the pleasure when eating fish. Furthermore, it was mentioned frequently that food is really important for health.

Typical Verbatims

"I was a vegan. Now I'm not any more but still my goal is to eat only healthy food as I think that our diet can prevent a lot of illness" (Italy, inland, female, 31 years, high fish consumption)

"I usually eat fish when I go out with my friends" (Italy, coastal, female, 31 years, average fish consumption)

"During weekend, we go somehow back to the Italian tradition and the family meal where all eat and stay together. During the week this is, due to the various agendas as sport, school and so on and so on, not possible any more" (Italy, inland, female, 51 years, low fish consumption)

Cooking and meal preparation (food in general). Most respondents cooked at home, and much importance is given to quality of the food and of the preparation (14/18). Almost everybody cooked every day and prepared something special for the weekend. Especially those in age group 2 and 3 usually had special preparation for Sunday lunch mainly due to the lack of time during the week. Sunday was considered a special occasion of staying together and sharing a good moment with the family. The most important criteria in preparing meals were health, quality and freshness of the ingredients.

Typical Verbatims

"My husband does not like to eat out – he always repeats that my meals are outperforming every restaurant" (Italy, coastal, female, age3, high fish consumption)

"The most important thing is the quality of the fish" (Italy, coastal, female, 26 years, average fish consumption)

"I don't want to buy cello wrapped fish, because I've seen that they take fishes not fresh and they make fillets, in this way you cannot understand how much fresh is the fish" (Italy, inland, male, 29 years, average fish consumption)

"I prepare every day balanced meals for my children although it is difficult to keep quality because of their very different schedules. Only during weekends, we manage to have a good moment together" (Italy, inland, female, 51 years, low fish consumption)

3.4.2 Shopping and food categories

Main substitutes for meat and fish

The most important substitutes were considered eggs, vegetables, chicken, and less frequently cheese, salami and soya.

3.4.2.1 Fish shopping and consumption

Purchase

The shopping was done by those who prepared the meal. Majority used Hyper and Super markets, mainly for convenience (all food products and household products at the same place) and lower price, although only three respondents did their shopping one time a week in Hyper or Super markets. Butcher, fishmonger or vegetable shops were also used by the majority, mainly because of more trust in local shops. Respondents were more sure about the quality when shopping close to home. All inland respondents usually bought fish in the supermarket (more trust in rules and control in supermarkets), whereas coastal respondents bought fish at the fishmongers (more trust in their local shops).

Key attributes for fish

Freshness was one of the key attributes for fish purchase, for all respondents. Further, they gave extreme importance to quality and were not willing to trade off quality against lower prices. Consequently, price did not influence their choice, except if the lower price was offered in the category of quality acceptable to the respondents. High fish frequency consumers at the coast vary the species they usually buy, to save money (green fish instead of sea bream) but would not (or very rarely) buy aquaculture sea bream instead. Branded fish sticks were not substituted with lower price and lower quality fish sticks. Young people, especially under 30 years, were more price concerned (due to lower budget for food shopping). Origin was considered really important for half of the respondents. They preferred buying Italian (or even local) products or products from countries they knew very well and trusted. Brand was not considered an important feature for those who preferred fresh fish. However, the trust many of the respondents have in their own or known fishmonger was like a substitute for a brand. In terms of processed or frozen food, the brand became an important cue. The respondents had very little knowledge of certification, and considered it unimportant.

Image of the food category

Overall, fish has a positive image and more positive than meat. Several mentioned it was lighter and healthier than meat.

Negative information mentioned included news about heavy metals in big fish, and mercury contamination was mentioned by $\frac{3}{4}$ of the respondents. One remembered also a pangasius scandal in schools following a TV report about farming conditions. News about intense catches were also mentioned. However, **positive information** were mentioned as well, such as sustainable fishing.

Typical Verbatims

“The most important thing is the quality of the fish” (Italy, coastal, female, 26 years, average fish consumption)

“We only buy from the fishmongers or fishermen. To have fresh fish is better to go in the morning at 6:00 o'clock to find what's fresh. We never buy at supermarkets or minimarkets even if there are more controls on the products

because it's a better feeling to buy directly from the fisherman" (Italy, coastal, female, 27 years, average fish consumption)

"I think that in big supermarkets the control on the product should be granted" (Italy, inland, female, 57 years, high fish consumption)

"I had an extremely bad experience with buying fresh fish at the local market – I only buy frozen in the supermarket" (Italy, inland, female, 51 years, low fish consumption)

"I prefer 100 % Italian, even local, when it comes to fish" (Italy, coastal, female, 46 years, high fish consumption).

"I buy Italian/local – it is a triple satisfaction because you trust, you know the quality, you create/maintain work places" (Italy, inland, female, 40 years, low fish consumption)

3.4.2.2 Meat shopping and consumption

Purchase

Most of the respondents usually bought meat at supermarket. But butchers were also very common in Italy and used by many who trusted butchers more than the supermarkets. Usually people bought meat two or three times a week.

Meat consumption

From the analysis it may be interpreted that the consumption of (mainly red) meat was decreasing in the last years as people do not consider it healthy food. Since health was one of the most important topics, meat was no substitute for fish, on the contrary, fish consumption increased due to this decrease in meat consumption. Fish and meat were both considered sources of protein, but fish proteins were considered better.

Image of the food category

Scandals such as BSE and recent data on carcinogenic effects of red meat contributed to the decreased meat consumption. A few of the respondents mentioned papers and research about the link between meat consumption and some types of cancer.

Typical Verbatims

"We are eating less meat than before, because we know that is not very healthy... but my father in law was a veal farmer and he always said we were safe with his meat. We had also a case in our family (cancer) so we are very informed of these kind of food that are not very healthy" (Italy, Inland, male, 55 years, low fish consumption)

"I love meat, but sometimes I eat fish because it's healthy" (Italy, coastal, female, 31 years, average fish consumption)

"I'm really interested in food: I read books, I go to conferences about this. I also follow influent people of this field on social networks" (Italy, Inland, female, 25 years, high fish consumption)

3.4.2.3 Substitute shopping and consumption

Eggs were the first substitute for most respondents, mainly because of good quantity of proteins. Usually, bio eggs were chosen and origin and certificates were of importance.

Three of the inland respondents substituted fish with cheese and “salami”, although they said it not healthy. Eggs, cheese and salami were bought only once a week at supermarket. Only a minority used grocery shops, because they looked for better quality and were not price sensitive.

Vegetables were not really substitutes because they were mainly consumed in addition to fish and meat and other, every day, only sometimes as the main course. A few respondents made a distinction between animal and vegetal proteins. Vegetables instead follow the fish-meat pattern and are bought mainly fresh in local shops or at the market. One of the mainland respondents had clear substitutes according the type of preparation of fish he would eat, e.g. fish sticks substituted with breaded mushrooms, roast beef for carpaccio of fish etc.

Typical Verbatims

“I pay more attention on the Certificate of Origin, for this reason I buy in a cooperative supermarket because the network provides me the idea of more control: they have agreements with the local producers that do not ensure better quality but it seems that more control takes place and there is a shorter supply chain in respect to the others” (Italy, Inland, male, 29 years, average fish consumption)

“I frequently buy organic chicken – two or also three times a week if I can get it – at a local farm” (Italy, Coastal, female, 46 years, average fish consumption)

“I am more frequently shopping for vegetables at the shop nearby than I am shopping for everything else” (Italy, coastal, female, age 3, high fish consumption)

3.4.3 Fish in general

3.4.3.1 Fish consumption

The respondents had moderate preference for consuming fish at home, but restaurants were used as well, especially for the species the respondents did not consume at home. All respondents considered fish as an important part of their diet. In a few cases fish was “for special occasions” such as Christmas eve or Easter holidays or family events (birthdays and similar), but then the fish dish involved more complicated ingredients and recipes and usually more expensive fish.

Fried fish was rather consumed at restaurants than at home, because of implications during cooking (strong smell and time consuming preparations). Further, as fried fish was considered unhealthy (heavy

to digest), such dishes were not frequently consumed at home but considered as "a good exception to the rule" when eating out. Similarly, fish species not consumed at home (due to preparation difficulties) were had in restaurants. Sushi was the restaurant dish par excellence; it was very popular especially for the younger age groups under the "all-you-can-eat" formula.

Fish coming from the sea was preferred, and the top cited species were sea bass, sea bream followed by shellfish (calamari, mussels, shrimps, etc.), salmon, tuna and swordfish. Fresh water fish were less preferred by the Italian respondents that favour the taste of the fish coming from the Mediterranean Sea. Most respondents preferred wild fish to farmed. The main reason was increasing concern about conditions in farming, especially animal feed and the use of antibiotics. This was mostly emphasised with regard to salmon and pangasius.

In some cases, some of the members of the household disliked fish or only liked a few species (salmon on the top among them). The dislike was related to removing skin and bones especially for the younger in the household. It could also be the taste, smell and consistency (mostly trout) which was disliked. In such situations, choice of fish for family meals was adapted to the wishes of these family members. The person in charge of the food purchase and meal preparation could also influence the household fish consumption, e.g. by introducing regularly.

The most frequently consumed species were octopus, squid and cuttlefish, which were considered cheap, tasty and easy to prepare species. Salmon was very much liked, for its taste, easiness in consumption (fillets, slices) and for its versatility in preparations. Together these species can be used for first course dishes, which for Italy is represented by pasta or rice based dishes, and for second course dishes as fillets.

Tuna, sea bass and sea bream were considered among the most "noble" species because of their taste, being considered very delicious. Also, the species were considered very easy to prepare. Another important key factor was the lightness of their meat, especially for sea bass and sea bream that made this species very indicated for healthy and light meals but without compromising the taste of the meal.

Sword fish was among the most preferred species in the coastal area frequently consumed by majority of coastal respondents (7/9) but only by two of inland respondents.

Cod was sometimes consumed by half of the respondents. Taste of cod was not very liked, but it was on average cheaper than other species, and related to traditional recipes (if salted). Sardines and anchovies were also not frequently consumed, probably due to the strong taste and the low price. Anchovies in the salted format, and salmon trout and trout were also sometimes consumed despite they were not very liked. For trout, one of the reasons could be related to sport fishing that is very common and also is forbidden to throw the fish back in the lake and therefore this fish may sometimes end on Italian dining tables. Salmon trout is consumed as one of the main substitute of salmon.

Rarely or never consumed species were catfish and herring. Catfish, trout and salmon trout were not frequently consumed due to strong taste typical for fishes coming from fresh water that seems not to be appreciated by Italian's. Herring was said difficult to find and for having strong taste different from fishes coming from the Mediterranean Sea which Italians were used to. Redfish, Monkfish and Rockfish

despite being very known and available were rarely consumed, probably because they were found to be less “noble” compared to sea bass and sea bream. No distinctive differences between coastal and mainland areas were observed.

Typical Verbatims

“Fish is part of the daily diet; I like when I come back from training to have a nice fish to eat” (Italy, Inland, male, 29 years, average fish consumption)

“My little brother (12 years old) likes fish less because he is a baby. It is mostly related to the fact that fish has bones, sometimes is difficult to eat and it happens that a bit of sand remains in the dish. But probably are just baby complains” (Italy, Coastal, male, 23 years, low fish consumption)

“At home we both eat fish, but for my wife who is from Brazil is more difficult to make her like some varieties, because for her tradition they are more used to eat meat instead of fish. I had more difficulties with green fish and especially the varieties with a lot of bones are hard to eat. More appreciated by her for example are Salmon fillets that are very easy to eat. With time she will get used to more species and more difficult-to-eat species” (Italy, Inland, male 29 years, average fish consumption)

“I usually order mussels at the restaurant because I do not like to clean them at home” (Italy, Coastal, female, 46 years, average fish consumption)

“At the restaurant, I usually eat sea bream “sotto sal” which I never prepare at home” (Italy, Inland, female, 51 years, low fish consumption)

Motives and barriers for fish consumption

Regarding the **motives for fish consumption**, there was a consensus between coastal and inland respondents. Most mentioned health related qualities of fish regarding motives, such as healthy, omega-3, good fats good nutrition, light and easy to digest. Several also found cooking (easy to cook and versatility) and taste to be a motive. A few mentioned availability of fresh products, seasonality and discounts/offers and tradition.

Typical Verbatims

“I think that our diet can prevent a lot of illness” (Italy, inland, female, 25 years, high fish consumption)

“I’m getting older so I need to think more and more to what I eat” (Italy, inland, female, 51 years, average fish consumption)

“In our family we are more familiar with fish because it’s in our tradition to buy and cook fish with respect to meat” (Italy, coast, male, 46 years, average fish consumption)

“Fish is healthier than meat for this reason we keep eating it” (Italy, coast, male, 46 years, average fish consumption)

“Our consumption of fish has increased during the years, because of the good properties of this kind of food. It is a good way to prevent illnesses: better eat fish rather than take drugs to be cured” (Italy, inland, female, 57 years, high fish consumption)

“I love meat, but sometimes I eat fish because it’s healthy” (Italy, coast, female, 31 years, average fish consumption)

Barriers for fish consumption were generally few and no differences were noted between coastal and inland regions. Several respondents mentioned bones, mainly respondents in age group 1. Very few also mentioned cooking disadvantages (long time, difficult), price, farming concerns (animal feed, life conditions). Freshness/quality, seasonality, heavy metals, and household members were rarely mentioned.

Barriers such as origin, quality/freshness, seasonality, heavy metals and catching techniques were rather an issue among age groups 1 and 2 (under 55).

Typical Verbatims

“When I lived alone, I paid more attention on money” (Italy, coastal, female, 26 years, average fish consumption)

Effect of positive or negative press

Main sources of information about fish were via journals, TV, newspapers, friends and family, publicity in general and social networks.

Main positive press was related to fish being good for health and good for memory.

Several negative press topics were mentioned, mainly related to pollution, such as fish that swim close to the boats and eat oil from the engines, high level of mercury in fish, as tuna, sea bream or big fish in general. Negative press was also regarding animal feed and usage of antibiotics in aquaculture and general negative news about farming and origin of Pangasius. Mussels and shellfish that live in dirty waters were also mentioned, tuna from China with no controls/less regulations and finally debate between fishing and aquaculture.

Six of the 18 respondents stated that they were not affected by negative press or negative information about fish. Main information in press was not considered reliable. Mass information could be destructive campaigns against certain some food categories.

Sever of 18 respondents stated they were affected by information or changed their behaviour based on information about fish. In some cases, negative press has led to reduction in consumption, in other more extreme cases they quit completely the consumption of some species/products. For example, one of the respondents stopped buying Pangasius after negative news.

Five of the 18 respondents did not actively search for information about fish.

Typical Verbatims

“I follow my favourite brand on FB, Instagram and other social network” (Italy, inland, female, 25 years, high fish consumption)

“I eliminated farmed salmon from my usual shopping because I’ve heard about the usage of antibiotics and the crowding conditions in which they are kept to make them grow. Also for meat, that being farmed if there is no a very supervised supply chain the risk is very high” (Italy, coastal, female, 70 years, high fish consumption)

“We don't know what to eat anymore, we continue to hear information about all kind of food” (Italy, inland, male, 55 years, low fish consumption)

“Negative press of fishing in Great Britain dramatically reduced my consumption at home” (Italy, inland, male, 29 years, average fish consumption)

“I tend to be more influenced by negative press and do change my behaviour accordingly ...but as time passes one forgets” (Italy, coastal, female, age3, high fish consumption)

“I am influenced by word-of-mouth of my friends only. All the general campaigns like cancer and red meat, mad cow disease, bird flu, chicken and antibiotics seem to be started by lobbies against entire categories of food” (Italy, inland, female, 40 years, low fish consumption).

3.4.4.2 Buying fish

Place of purchase

Majority preferred to buy fish at fishmongers (13) and hypermarket/supermarket (11), followed by local markets (5) and frozen shops (4). For the coastal areas fishmongers and local markets were the most preferred place of purchase while in the inland regions hypermarket/supermarkets and frozen shops were the most chosen for fish purchasing. This was probably due to the good availability of fresh products in coastal regions. Along the coast, in general, the fishmonger was the main place of fish purchase.

Online shopping was by far the least preferred option to buy fish, which was due to lack of visibility (to look at the fish and make an evaluation on its quality). Respondents in inland regions did not have trust in the local markets (quality of the fish and hygienic was questioned). Therefore, hypermarket/supermarkets were preferred as they were considered more reliable (big corporations under several controls by the authorities). To the contrary, coastal respondents did not buy fish from hypermarkets/supermarkets because they considered them unreliable for the fish quality. Instead, they preferred to buy from fishmongers or local markets (trust and tradition of buying fish from the local markets it is deeply-rooted).

In both coastal and inland regions, freshness and quality was the key buying criteria but resulted in completely different shopping habits. In both cases, trust (or the lack thereof) was the key element influencing the choice of place of purchase.

Type of products

Fresh fish was by far the most preferred type of products. All coastal respondents and 7/9 inland respondents indicated fresh fish as most preferred. Frozen, canned (mainly tuna and salmon), salted, and smoked were also rather popular among both coastal and inland respondents. Only few used sushi, breaded sticks and dried formats with no particular distinctions.

Mainly tuna and sometimes mackerel were bought canned. For salted formats the most commonly cited in the coastal were anchovies, bought fresh and then preserved in salt. Salted cod (“Baccalà”)

was popular; frequently cooked “a la Vicentina” or with polenta in inland regions or with special coastal recipes.

Surimi, ready to eat, and breaded fish sticks were the least preferred products by majority of the respondents both in coastal and inland regions. A few mentioned soup, sushi, and processed food as least preferred products. Processed food seemed to be perceived as not healthy and not trustworthy for the freshness and quality of the ingredients. Italians take pleasure in cooking and use fresh ingredients.

Buying decisions

Freshness was the most important determinant for buying fish, identified by the majority of respondents. The criteria for freshness were appearance (colour, skin, eyes, smell etc.). Many also mentioned certification, which in Italy is also origin/provenance. The respondents wanted to know where the fish came from. Not only if it was local, which were preferred, but also to make a good evaluation of price and quality and to avoid to be “tempted” by promotions for products from countries not trusted. Other “certifications” were not mentioned.

Price was also important criteria for many. This was especially important for average and high frequency fish consumers. Price was also an indicator of quality which was much higher for the local fresh products. It appears the respondents did not trade off price for quality. Instead the changed species (sea bream to blue fish instead of farmed sea bream; would not buy low quality fish sticks due to a better price).

For several, mainly coastal respondents, trust in the salesperson was important in the decision of fish, especially in acquiring information about the new arrivals, recipes, and other information. Inland region respondents rather made their choice on implementation of promotions. This was likely to be due to that they purchased more at the supermarket and as a consequence were more subjected to them. For a few inland respondents, issues related to the preparations were important as well as brand, seasonality and kind of species.

Minor differences were observed between male and female buying criteria, except that males indicated that promotion was not important for their purchasing whereas 42% of females, cited promotions as important.

Typical Verbatims

“I have the idea that picking with attention is possible to find good quality at reasonable prices, nutrition is very important here (Genoa) and the seller should be aware of this need. Here, I have the feeling that is verified, sellers suggest all type of quality high, medium, low; there are also promotions, is possible to choose based on customer's needs” (Italy, coastal, female, 70 years, high fish consumption)

“We only buy from the fishmongers or fishermen. To have fresh fish is better to go in the morning at 6:00 o'clock to find what's fresh. We never buy at supermarkets or minimarkets even if there are more controls on the products because it's a better feeling to buy directly from the fisherman” (Italy, coastal, female, 27 years, average fish consumption)

“I pay more attention on the Certificate of Origin, for this reason I buy in a cooperative supermarket because the network provides me the idea of more control: they have agreements with the local producers that does not ensure me better quality but it seems that more control take place and there is a shorter supply chain in respect to the others” (Italy, inland, male, 29 years, average fish consumption)

“Why there is no brand on the fresh fish? There are no consortiums that guarantees the quality of the product? Why when I buy fresh fish there is no brand on which I can rely? Because for example on meat there is Cremonini brand, and I know that I have more guarantees on it” (Italy, inland, male, 55 years, low fish consumption)

“When I have to organize special dinners I ask to my favourite fishmonger with whom I have a friendship relationship since many years and he procure to me the local fish that I need and I know for sure that the quality and freshness is very high” (Italy, coastal, female, 59 years, low fish consumption)

“For example, I was tempted by a very good offer of shrimps but when I saw the origin, Indo-China, I didn't feel comfortable in buying them.” (Italy, coastal, female, 59 years, low fish consumption)

3.4.3.3 Storage and preparation of fish

Fresh fish was generally prepared the day of purchase (frequent purchase rather than storage). Frozen, canned and salted fish could be kept, which was mentioned as an advantage (can be stored without losing properties, always available and does not need planning beforehand).

3.4.3.4 Knowledge of fish categories and species

Haddock was the least known species in Italy, it was not recognized by 17 of 18 respondents. Halibut, whiting, pangasius and Alaska Pollock were not recognised by roughly half of the respondents. There were noticeable differences between age groups as the younger did not recognise 12 species compared to six species that were not recognised within age groups over 30 years. Slight difference in knowledge was observed between coastal and inland regions as coastal respondents did not recognise eight species against 10 not known among inland respondents.

Fish categories

Sorting task of focus species (the Primefish species) and other selected

The categories made by the respondents were in total 69. The respondents from the coastal area made 40 categories with an average of more than four categories per respondents, indicating a better knowledge of the fish and more involvement compared to inland respondents identifying 29 categories with an average of three categories per respondent. Respondents in age group 1 identified nine more categories than the other two age clusters.

Most grouped fish by **cooking** categories. They divided fish species in to use/non-use; fish that had similar ways of cooking (e.g. grilled); fish that were very versatile in preparation; used as first course (by Italian tradition); common recipes and so on. The coastal respondents grouped more in cooking

categories than the inland respondents. Only one respondent in the youngest age group, grouped the species for cooking. Those who consumed fish less frequently, grouped fish by cooking categories, while others grouped fish in categories such as type, format and origin.

Many respondents grouped fish by **type of fish**, such as green fish, fresh water fish, shellfish, fish from the sea, predator fish, cliff fish or simply by separating one single species like cod and herring that for the Italians are special categories of fish (*interviewer comment: Cod is prepared according to special recipes which is very tradition depended*). Herring was sorted out as it was recognised but not frequently consumed, rarely available at the fish counter, or simply because respondents related it to trip to Nordic countries. The majority of respondents identifying these categories were from the coast. The oldest respondents made up four of six of these categories and majority were females. The species were also categorised according to the most common **form of product presentation**; Sliced, canned, frozen, and fillets were the most common adopted format and also used in categorising fish species. There was no special distinction between coastal and mainland areas but respondents in the youngest age group used a simpler grouping (tuna canned, herring or cod salted, salmon smoked etc.). Categories related to **origin** varied widely. The respondents grouped fish from the North, fish from the sea and fish from fresh water. There was a strong controversy between sea and fresh water fish (confirmed by consumption in the following section). Respondents from coastal regions made four of the five categories related to origin. Males very in majority of 4/5 (very high considering only 6 respondents were males against 12 females).

Other categories included taste (Like, don't like, same taste), use (consume, do not consume), knowledge (less known species), quality (Fine fish, more prestigious/expensive), fat (High fat content, low fat content), reputation (Industrial products), catching (Fishes that can be caught), size (big and smaller fish).

In general, people from the coastal regions showed a more knowledge about fish making the majority of grouping by type, cooking and origin. Among the age clusters it was evident that the less experience with fish the simpler categories were identified, such as format of consumption and taste. Among age groups 2 and 3 the distinction got more sophisticated by cooking recipes/preparations, type, quality and presence of fats. Females identified six categories more than males and especially by frequency and the level of knowledge (3 times) which no male made. Males were more concentrated on cooking and origin of the fish.

3.4.4 PrimeFish species

Trout

Trout was recognised by everyone. They were familiar with the species, but not very liked (sea fish was preferred). Main associations were origin (river, lake), farming activity (intensive farming), salmon trout, smoked, fat and bones. Very few respondents liked trout, but those few who did, liked the taste, sustainability or it was only liked if it was salmon trout. The majority of the respondents disliked the taste of trout (strong and very peculiar of fresh water fish and the association with the soil in which they live), they also disliked that trout was farmed.

Trout was rarely consumed, the few that did consume this species, consumed trout 2-3 times a year. The most common form of recipes was cooked in oven “papillot” style at home (trout was never consumed at restaurants). Trout was mainly consumed because during fishing, it is forbidden to throw fish back in the lake, so it had to be consumed. Freshness and origin were important criteria for consumption, and trout was always had fresh. Most respondents did not assume their consumption of trout would change, but in two cases it was expected to reduce other products preferred and for farming reasons. Salmon would be the main substitute for trout.

The main buzz affecting the consumption (reduced) was related to the farming activity and the use of animal feed.

Typical verbatims

“It’s a fish that tastes less fish than sea fishes” (Italy, coastal, female, 70 years, high fish consumption)

“For me it’s like it doesn’t exist” (Italy, inland, male, 55 years, low fish consumption)

“I do not like trout – it tastes like soil but maybe we just do not know how to prepare it” (Italy, inland, female, 36 years, low fish consumption)

Herring

All respondents recognised herring, but it was not familiar and rarely consumed. Herring was mostly associated to the north of Europe (Scandinavia, north, cold, Finland) and then with type of products (smoked, salted dried). It was associated with special occasions or personal experiences such as friends, Poland, Finland, family origins. Herring was mainly liked for its taste, but healthy properties were mentioned as well, as well as the fact it was not farmed. Taste and cooking method was also what herring was disliked for.

Herring was rarely consumed in Italy, once in a lifetime, once a year are the most frequent answers among those who consumes this species. It was mostly consumed smoked, salted or dried, either at home or during travel. Place of purchase of smoked, salted or dried herring was at the supermarket (inland) and fishmonger (coastal). The purchase was not planned and no special criteria for choice of purchase was mentioned (only one respondent mentioned fleshy character when choosing dried herring).

Typical verbatims

“It’s a product that is not very common in our country, very difficult to find. I would like to have it in a restaurant on the sea, I think it’s a romantic fish” (Italy, inland, female, 57 years, high fish consumption)

“My husband likes it a lot but I can never find it” (Italy, coastal, female, age 3, high fish consumption)

Salmon

All respondents recognised salmon and all were familiar to the species which was consumed by 16 of 18. Main associations were related to how salmon was consumed and 11/18 mentioned at least one way to consume it in their associations (tartare, carpaccio, smoked, fillet, penne pasta with white cream, recipes, pasta, mayonnaise). Sushi was a very frequent association, mentioned by 6/18,

showing how Japanese cousin has become popular in Italy. Other associations were tasty, pink, family, good properties, Christmas.

Main likes were related to diverse ways to cook salmon and to how easy it was to cook and to consume it, sensory properties such as consistency, taste and colour. Five respondents liked everything about salmon. Very few could mention any dislikes about salmon, but main dislikes were bones, farming and one did not consume salmon because of smell and another because of taste.

Salmon was among the most frequently consumed species, at least once a week on average, both in inland and coastal regions. The consumption of salmon had increased for the majority of the respondents, with one exception where the consumption was reduced due to intensive farming.

Salmon dishes were various, consumed raw (sushi, tartar, carpaccio), smoked (with bread, lemon and olive oil, pasta and white cream), sliced (grilled, pan, oven). Salmon was mainly consumed at home, but restaurants were also appreciated especially for sushi. Salmon was consumed by all household members. It appeared in general that the fish lovers in the household influenced more what was consumed than those who did not like fish.

The preferred place of purchase was fishmonger for the coastal area and at the fresh corner of the supermarket for the inland respondents. In all cases, fresh salmon was the preferred format, sliced, cuts, fillets but in case of smoked salmon, vacuum packed at the supermarket was accepted. Salmon was always and everywhere available unlike other species and therefore purchase could always be planned. Criteria for choice of purchase was freshness for fresh salmon (colour, freshness), origin (Norwegian, Scottish) for smoked, but for frozen salmon it was maintaining characteristics, and if flexibility in choice of menu was needed. Most respondents mentioned salmon trout as substitute for salmon, but many did not substitute salmon.

Main buzz regarding salmon was negative press of farming activity.

Typical verbatims

"It's a product that should be taken in small doses" (Italy, inland, male, 55 years, low fish consumption)

"Salmon is "enchanting", it is my day-to-day fish" (Italy, coastal, female, 46 years, average fish consumption)

"I like salmon because of the many recipes – for pasta, for a main course and because I have it always available without having to plan" (Italy, inland, female, 51 years, low fish consumption)

Sea bass

Sea bass was recognised by all respondents and all were familiar with the species. Main associations were preparation (grilled, filet, acquapazza style, cooking way, en Papillote, easy to cook, "A la ligure" style, simple, complicated, fast, cooked with herbs, good size). Other were related to sensory properties (taste, salty, good, delicate, light, soft, silver fresh), occasions (sea, summer, dinner, holiday, Sunday). Other associations were good quality, green fish Esselunga (retail chain), aquaculture, big distribution, King/queen of the predators, no fillets, bones. Main likes were easy to find and cook, very light (good for health), farming (the eco-sustainability of this fish), everything. Main dislikes were

related to taste, fish bones, difficult to eat, difficult to find wild at a good price, usage of animal feed in farming, or nothing was disliked.

Sea bass was very frequently consumed, mainly in the coastal regions where the consumption was once a week, but one or two times a month in inland regions. The consumption had remained stable or increased due to the acquired ability to cook and more time available to spend in the kitchen. Commonly sea bass was consumed grilled, “A la ligure”, Acquapazza, en papillot, pan with herbs, salt crust with potatoes, olive oil and potatoes, both at home and restaurants. Main occasions were during the weekend, Sunday lunch meal, new year's eve. Sea bass was mainly purchased at the fishmonger/local fish market or at the fresh corner of the supermarket. The mainly criteria for purchase was related to the freshness of the product (lucid, red inside, eyes) and the hygiene of the place of purchase. Most respondents mentioned sea bream as the main substitution for sea bass, but a few mentioned hake, chicken (with French fries, sometimes cooked in oven) or cheese/beef cold meat.

Buzz about sea bass was scandal from the Greek or Croatia farmers about animal feed and pollution in the water because of farming.

Typical verbatims

“My consumption during the last years has increased, probably because now I'm more able to prepare it, when I was younger I had less skills and less time to spend for cooking” (Italy, inland, female, 57 years, high fish consumption)

“Local sea bass is exceptional, light, delicate with a very nice “flesh”” (Italy, coast, female, 46 years, average fish consumption)

Sea bream

Sea bream was recognised by all respondents and they were all familiar with the species. Main associations were preparations (grilled, filet, Acquapazza style, cooking way, en Papillote, easy to cook, “A la ligure” style, simple, complicated, fast, cooked in the oven), sensory characteristics (tasty, salty, good, delicious, light, consistency, fat, perfumed, compact meat, nice eyes, grey), occasions (sea, summer, restaurant, dinner, holiday, Sunday, Esselunga, for guests, Liguria) and other associations were green fish, aquaculture, big distribution, bones, difficult to find, satisfaction, sympathetic, chic. Main likes were related to availability and easy cooking, taste, light and good for health, eco-sustainability of this fish, or the respondents liked everything about the fish. Dislikes were mainly lack of taste, fish bones, difficult to eat, less digestible than sea bass, or use of animal feed.

Sea bream was frequently consumed, once a week in coastal areas but one to two times a month in inland regions. It was more difficult to find compared to sea bass and therefore a bit less frequently consumed. The consumption frequency had remained stable or increased in some situations due to the acquired ability to cook (more time spent in the kitchen). Main forms of recipes were Acquapazza, en papillot, grilled, “A la ligure”, pan with herbs, salt crust with potatoes, olive oil and potatoes. It was consumed both at home and at restaurants (similar to sea bass the “special occasion” fish – to have a very nice fish, and/or the fish which is usually not prepared at home). Main occasions were during the weekend, during camping grilled, Sunday lunch meals and new year's eve.

Sea bream was mainly purchased at the fishmongers/local fish market or at the fresh corner of the supermarket. The main criteria for purchase was related to the freshness of the product (lucid, red inside, eyes) and the hygiene of the place of purchase. Majority would substitute sea bream with sea bass, but others mentioned chicken with French fries (something cooked in the oven), cheese and goatfish.

Similar as for Sea bass, buzz about the species was related to scandal from the Greek or Croatia farmers about animal feed and also pollution in the water because of farming.

Typical Verbatims

"Its flesh is very consistent and is comparable with meat or a good steak. For everyday consumption, from a nutrition point of view, are better sardines (green fish)" (Italy, coastal, female, 70 years, high fish consumption)

Cod

Cod was recognised by all respondents and was very familiar, especially frozen cod. Main associations were related to cooking and consumption (simple/easy to prepare, fried, polenta, boiled, fish & chips, versatile, Vicentina style, fast to cook, fish sticks, Baccalà), sensory properties (tasty, particular taste, gummy, not very good, bland, no good, fat, white, blue), occasions in life (home, family, childhood, grandmother, hospital, past in Paris), places (North of Europe, Atlantic, North, supermarket, Sea, Norway), products (fillet, breaded, frozen, box, salted, smoked, blocks), other (Green fish, history, deep sea fishing, industrial/processed, cold, Findus breaded sticks, radically different quality. Most liked how easy it was to find cod, easy to cook, bland, mostly frozen, easy to eat, healthy fats and strong taste. Dislikes were that perfect cooking timing was required, difficult to cook (Baccalà), anything, bad smell, association with street food (fried).

Consumption of cod was rather frequent among the respondents, c.a. once per month. The consumption had remained stable for most but in two cases the consumption was reduced because of change in changes of preference for species or because avoidance of consuming fried products. In one case, the consumption increased due to the healthy properties of cod. Main form of recipes was boiled with vegetables, fried, breaded and fried, fish & chips, baccalà (traditional Italian recipe). Healthy dishes were consumed at home, whereas fried cod was more frequently consumed at restaurants.

Cod was bought frozen or salted at supermarkets, but in the coastal areas, cod was bought fresh or salted at fishmongers. Criteria for purchase, was advise from fishmongers. Very few mentioned substitute for cod, although two mentioned cheese and hake.

Buzz about cod was negative press of fishing in Great Britain which had dramatically reduced consumption at home.

Typical Verbatims

"Cod is very versatile, is possible to cook it in many ways especially for sea food and their combination with pasta" (Italy, coastal, male, 46 years, average fish consumption)

"The fact that Findus has this sticks it's a bad association for me because I'm against processed food and also frozen food. For this reason, even if I'm able to find it fresh, it is the only situation in which I say no and I buy

something else. For me it's like a bad advertising for this species" (Italy, coastal, female, 27 years, average fish consumption)

3.4.5 Perspective

Effect of interview on the participating subjects

The interviews were likely to influence the respondents. In general, they estimated they would think about their consumption in a way they never did before, making them more aware of their behaviour about food in general and especially fish. They would likely pay more attention to labels, origin, and the process of food production.

Change in fish consumption during the last 5 years

During the last five years, fish consumption had increased among majority of the respondents, for different reasons. Especially for respondents 55 year and older, fish became a more import factor for their health, due to good properties such as omega-3 fats and being light and easy to digest. Some reduced their consumption of meat, because of negative news about meat, resulting in increased consumption. For the younger respondents, the main reasons for increased fish consumption was the increased affordability (being mainly students before), increased skills and more time for cooking.

Future fish consumption

The majority of the respondents did not expect significant changes in their fish consumption in near future. Potential reasons for a further increase in fish consumption were related to a reduction in polluting elements in the sea, more controls over farming activities to solve the concerns related to animal feed, usage of antibiotics and living conditions of the fishes. Another relevant element could be reduced price or even a will to try new species.

3.4.6 Overall conclusion

The results from the interviews conducted among the 18 Italian respondents indicated some differences between coastal and inland regions. Respondents from coastal areas had more knowledge about fish, had a richer tradition of fish consumption. They generally showed a better knowledge about fish species and their characteristics and ways of preparation (recipes, time to cook, ingredients, etc.).

Although consumers from both coastal and inland regions appeared to prefer fresh fish, they had a very different purchase behaviour. The supermarkets or hypermarkets were the preferred outlet for the inland respondents, while local markets and fishmongers were used by the respondents living in coastal areas. However, for both groups, trust in quality, freshness and origin was a driving factor for the choice of place of purchase. Price was another important factor at the moment of purchase,

however, it is important to underline that Italians do not trade off quality for price. Lower prices or promotions influenced purchase only if they were related to the habitual quality the consumer was used to. Very limited importance was given to certification (only with respect to origin).

Health and pleasure were the main motives for consumption of fish, both at home and at restaurants. The variety of consumed fish was considerable, in both coastal and inland regions. Octopus, squid, cuttlefish, salmon, tuna, sea bass, sea bream, anchovies, shellfish, mackerel, swordfish and sole were the most preferred fishes that the Italian respondents liked to consume. Salmon was considered among species with the best range of possibilities with regard to preparation, while octopus, cuttlefish, and anchovies were chosen for their taste and price. Species such as tuna and swordfish were chosen because of the consistency of the flesh, mainly consumed in slices but sea bass and sea bream were chosen for the light and sophisticated taste.

Of the selected PrimeFish species, **salmon** was the most preferred, for its variety in preparation methods, availability and its taste. **Sea bass** and **sea bream** were also very popular because of their delicacy, the specific dishes (such as en papillot or in salt crust). **Herring** was the least known and consumed species, mainly because of poor availability in the country, its strong taste, and lack of knowledge in preparations. **Cod** was liked as salted cod (“Baccalà”), which is a traditional product in Italy, to which specific recipes are associated to, such as “a la Vicentina” or Baccalà with polenta or typical Ligurian preparations. When perceived as “cod” instead of “baccalà” associations are rather negative and related to a low quality and lack of taste.

Compared to other European countries, fish consumption was high in Italy. In general, the fish consumption in Italy was stable, but had increased during the last five years (mainly as fish is increasingly used as a healthy substitute of meat). Factors which could induce an ever higher consumption were mainly related to health and price aspects, but also “new” fish species or experimentation with new recipes.

3.5 Spain

3.5.1 General consumption

Typical week food consumption

Generally, three or four meals were taken a day, adjusted to timetables, worktime or children school time (7-9h, 14-16h, 21-23h + mid-afternoon snack 17-19h). Meals in canteens at work or school were not as common in Spain as in other countries.

In most cases meals were had in kitchen or dining room at home. Meals were home made by all respondents on a regular basis. Only one of 18 respondents sometimes consumed ready-to-eat, ready-

to heat / processed meals. Due to work timetables, a few respondents had lunch at work, either a meal cooked at home and had in the office or at a restaurant.

Restaurants were rather rarely used, but mainly during weekends or during weekends or on special occasions (birthdays, Christmas, etc.). Fast food was generally not consumed, and home deliveries of meals were not used on a regular basis. A few of the respondents had a mid-afternoon snack, or a mid-morning snack. Two respondents usually took a light dinner. Most respondents take the majority of meals together with family, and three of the households hosted relatives for lunch either in workdays (due to timetables) or in weekends (family reunions).

For many, pleasure was and important drive for food consumption and in this context taste, emotions, cooking, and sharing meals with relatives were mentioned. Health was of major importance as well for food consumption, and two described food consumption as a need.

Cooking and meal preparation (food in general)

In most households, one person was in charge of cooking, usually a woman. In the other households the responsibility of preparing food was shared among several members. In three households, the wife cooked during work days, but the husband on weekends. Two respondents mentioned that due to change in habits (retired), they had more free time for shopping and cooking. Usually, cooking at home was done close to every day. A few mentioned a change of habits between work days and weekends, doing more elaborated food when entertaining, usually on weekends.

Many mentioned convenience and speed as the main factors affecting their cooking. Meat and fish meals were prepared grilled or in the oven by many respondents. Vegetables and fish were also steamed or boiled by many respondents. A few mentioned pan fried French fries, eggs and paella, and raw preparation of salads.

Taste and health benefits were important issues when preparing meals, although taste and health could be conflicting attributes.

Typical verbatims

"Health, fresh and natural" (Spain, coastal, female, 31-55 years, consumes fish 2-3 times per week)

"I care for health because I have children, taste, fast" (Spain, inland, female, 31-55 years, consumes fish 2-3 times per week)

3.5.2 Shopping and food categories

Main substitutes for meat and fish

Most respondents did not substitute meat or fish, but some mentioned pulses, eggs, or salad.

3.5.2.1 Fish shopping and consumption

Purchase

For fish purchase, fish markets were used by many, as well as fishmongers due to quality of the fish, communication with seller, variety and freshness of the products. Hypermarkets and supermarkets were also rather popular, due to convenience (open all day long, fish purchased with other foods). Freeze centers were mentioned by one respondent (convenience).

(Interviewer comment: Fast food chains/shops offering fish dishes are rarely found in Spain. In Spain, shops specialized in salted cod are considered here Deli shops. Usually, fishmongers clean, guts and slices the fish according to the customers' preference. Vendors provide services at fish corner in a hyper or super-market, fishmonger, fish market or deli shops, whereas self-service is required in hypermarkets, supermarkets and freeze centers)

Raw, fresh, whole, cut, fillets can be purchased at fish monger, fish market, hypermarket and supermarket. Smoked or dried fish products are mainly found Deli, but also in hypermarket and supermarket as well as at fish mongers or fish markets. Frozen products were bought at hypermarket and supermarket, and freeze center, but canned products at grocery stores, hypermarket and supermarket. Transformed/prepared fish (ready to cook, ready to heat or eat) sometimes can also be found in hypermarket, supermarket and grocery stores.

Consumption

Most respondents bought fish 2-3 times a week in the fish market, but others less frequently. Most often fish was consumed at home (during the main meal, either lunch or dinner). High quality fish (seabass) and shellfish were associated with special occasions or festivities. Fish was cooked, often grilled or roasted, accompanied with vegetables or potatoes, as a main course. The alternative to fish was meat (either fish or meat).

Majority of the respondents consumed mainly fresh fish, but two mainly consumed frozen fish. A few also highlighted a complementary consumption of frozen fish and canned fish.

Key attributes for fish

For fresh and frozen products freshness and other sensory quality attributes were important. Appearance was of major importance, and many of cited appearance as an indicative of freshness. Taste and appearance appeared to be a positive driver of consumption whereas bad smell of fish was as a barrier for fish consumption. Several respondents used information on packaging were origin and certification were of main importance, although nutritional, storage guidelines were used as well. Price was mentioned by a few.

Fishmonger was the most trusted source of information but sellers in supermarket were seen in a different way, as they did not offer advice. A few respondents considered communication during purchase less important than appearance and that the communication with the vendor could be biased by their interest to sell.

A few considered the information found on the internet to be important and others also highlighted the importance of promotions (users of supermarkets or hypermarkets). The respondents perceived TV as a non-trusted source of information or they felt as there was no information available about fish.

Typical verbatims

“Certifications are important if they are linked to origin” (Spain, inland, female, 18-30 years, fish consumption 2-3 times per week)

“Price is a barrier” (Spain, inland, female, 31-55 years, fish consumption 2-3 times per week)

Image of the food category

The image of fish/seafood was overall positive, and several related the food category to nutritious and/or healthy, but a few mentioned price as a barrier for fish consumption.

Compared to meat, fish was considered main source of protein. Further, fish was perceived as healthier than meat and could be consumed more often. Its lighter character made fish appropriate for senior consumers, people with disorders in the digestive system, children or as the main dish in dinners.

Origin was an issue frequently mentioned with regard to fish, resulting in preference of local products. Some respondents discussed a different taste between frozen and fresh fish. Taste was often mentioned as fish consumption barrier not present in meat consumption (compromises were often required due to the different fish preferences in the household). Respondents mentioned also need to freeze fresh fish before consumption to avoid parasites (anisakis). Fish was considered to be easier to cook than meat, but with a shorter product life than meat.

When fish was compared to other substitutes, no special differences were mentioned with regard to eggs as substitute, and pulses were considered a healthy source of vegetal proteins, with the same content as fish or meat when combined with rice or potatoes.

Main information about fish came from media, friends or family. Main **negative information** was related to scandals such as overfishing of stocks in media, as well as fish imported from far. Information about too much mercury content in fish due to pollution (especially big fishes as swordfish, bonito, and tuna) came both from media and friends. Information about Pangasius farming in polluted environments came from TV and friends. Less quality of fish was discussed among friends and family.

The main **positive information** about fish was about the healthiness of fish, fish is the healthiest food according to television, and in other media the omega-3 content was a discussion point. TV cooking programs were also mentioned with regard to positive information about fish as well as nutritional information on packaging.

Typical verbatims

“Compared to meat, fish is lighter, suitable for dinners, more exquisite and they have more time to enjoy it at nights” (Spain, inland, female, 31-55 years, fish consumption 2-3 times per week)

“I have cholesterol issues” (Spain, coastal, male, >55 years, consumption 2-3 times per week)

“I don't like publicity, I prefer to see the product” (Spain, coastal, female, 31-55 years, fish consumption 2-3 times per week)

3.5.2.2 Meat shopping and consumption

Purchase

Meat was mainly purchased at traditional markets, but also at hypermarkets or supermarkets. Butcher were also used by several respondents. Meat could be bought asking a vendor or in self-service (cello-wrapped). Meat was bought e.g. raw, fresh, whole, cut, sliced, frozen or transformed, i.e. adding ingredients.

Meat consumption

Meat was most often consumed at home, warm, accompanied with vegetables (potatoes, salad), rice, as a main course. The alternative to meat was either fish or nothing.

Key attributes for meat

Majority preferred to buy fresh meat, but a few froze the fresh meat to store it before consumption. Most people placed emphasis on the communication with the vendor. Price was a key attribute for meat purchase for many respondents, as was appearance which was mentioned as one of the main factors in purchase. Certification and origin were also important attributes, and a few emphasized nutritional information, environment, brand and quality. Animal welfare was mentioned by one respondent, publicity and promotion by very few.

Image of the food category

The overall image of meat was both positive and negative, of the 11 that commented on the overall image, five considered the image positive due to nutritious and filling properties, but six considered meat to have an overall bad image (not healthy, addictive, disgusting).

Only two respondents had received **positive information** about meat, linked to being tasty and healthy and did change their consumption because of this. **Negative information** or scandals about meat were several. Majority recalled red meat could cause cancer based on media discussion. The Bovine spongiform encephalopathy (BSE), commonly known as *mad cow disease* was known by several respondents from media discussions. A few also mentioned they had received information from media about higher fat content in meat than before, animals fed with hormones and cholesterol in meat.

3.5.2.3 Substitute shopping and consumption

Main substitutes were most often bought in hypermarkets, supermarkets or fresh food markets. Main product types were packaged and cooked pulses and fresh and packaged eggs. Sensory attributes were not mentioned as an important attribute, but a few mentioned price, nutritional information and certification.

Image of the food category was overall rather positive, pulses and eggs were considered healthy and a very important source of proteins

3.5.3 Fish in general

3.5.3.1 Fish consumption

The majority of the respondents consumed fish two times a week or more often. The main fish species consumed were tuna, hake, salmon, seabass, sardine, anchovy, monkfish, megrim, squids, horse mackerel, pomfret, cuttlefish, mackerel, seabream, cod, shrimps, mussels, clams, velvet swimming crab, scallops, Alaska Pollock, Peter's fish, white seabream, surimi, turbot, canned tuna, canned sardines, shellfish.

Usually fish was consumed as every day food, but a few species, such as shellfish, fresh tuna and sole were categorized as luxury products. The majority of the respondents did not prepare specific dish in their daily meals. Generally, the respondents considered themselves average or heavy fish consumers.

Motives and barriers for fish consumption

Main motives for fish consumptions were related to health, mainly due to omega-3. Taste, easy to consume and easy to cook was mentioned by a few as well. The most frequent barrier for fish consumption was smell during cooking. Other barriers were short storage time, not filling, expensive in comparison with e.g. meat or pasta.

Typical verbatims

"Not everybody has a place to buy fresh fish nearby" (Spain, coastal, female, >55 years, fish consumption 2-3 times per week)

"Frozen ?, we consume very little. It is healthy" (Spain, coastal, male, >55 years, fish consumption 2-3 times per week)

"I avoid pangasius when I buy frozen fish" (Spain, inland, male, 18-30 years, fish consumption 2-3 times per week)

Effect of positive or negative press

TV and internet were the most frequently mentioned media of positive or negative press in relation to fish. Majority claimed press did not affect their seafood consumption. The main negative press was

focused on pangasius (an unhealthy product), but main positive press was related to health issues like the omega-3.

Typical verbatims

“In Spain we eat a lot of fish” (Spain, coastal, female, 31-55 years, fish consumption 2-3 times per week)

“Children learn with the example” (Spain, coastal, female, 31-55 years, fish consumption 2-3 times per week)

3.5.4.2 Buying fish

Place of purchase

The most preferred place of purchase were fish market or fishmonger, mentioned by the majority of the respondents. Many also mentioned hypermarket and supermarket, but fewer freeze centers or organic shops. The least preferred were online shops and then organic food shop and deli.

Type of products

Fresh fish was preferred by majority of respondents, either whole, as stakes or fillets, but frozen products were also preferred by many. Canned, salted, dried and smoked products were rather popular as well. Ready to eat meals and processed fish were the least preferred products. Neither breaded fish nor ready to heat meals were popular.

Buying decisions

Majority of the respondents were affected by the surroundings when making buying decisions, the advice of the sellers being the most effective.

Freshness was the most important determinant for buying fish, identified by nearly everyone. Appearance, origin (wild or farmed), sellers advise and price/promotion affected buying decisions by several. A few mentioned certification/label, reputation and brand.

Typical verbatims

“I will never consume aquaculture products” (Spain, coastal, male, 31-55 years, fish consumption 2-3 times per week)

“Appearance is very important” (Spain, inland, female, 31-55 years, fish consumption 2-3 times per week)

3.5.3.3 Storage and preparation of fish

Fresh fish was generally prepared the day of purchase, but the majority of the inland respondents froze the fish before consumption.

3.5.3.4 Knowledge of fish categories and species

The majority of the 18 species (trout, salmon, sea bass, sea bream, cod, mussels and clams, monkfish, tuna, sole, sardine, hake and anchovy) were recognized by all the Spanish respondents. Alaska Pollock was the least known species in Spain, it was not recognized by nine persons. Redfish, herring and halibut were not recognized by seven. Mackerel, plaice and megrim were recognized by almost everyone.

Hake, tuna and salmon were the most frequently consumed species by the majority. Cod, mussels and clams, sea bream, sole, sardine, megrim and anchovy were also frequently consumed by half or close to half of the respondents.

Trout, herring and halibut were the least frequently consumed species, more than half of the respondents did not or rarely consumed these species. Monkfish, mackerel, plaice, red fish and anchovy were never or rarely consumed by half the respondents.

Fish categories

Sorting task of focus species (the Primefish species) and other selected

The categories made by the Spanish respondents were based on frequency of consumption (7), preference (like or dislike) (3), type of fish, such as shellfish vs fish (2) and whitefish vs. bluefish and seafood (1), white fish vs strongest taste (1) or origin (1), price (1) or form of product presentation, that is frequent use vs salted, smoked, caned, redfish pie (1). One respondent grouped the species in good or bad seafood based on reputation.

Typical verbatims

"Taste is important" (Spain, inland, male, 31-55 years, fish consumption 2-3 times per week)

"Whitefish has strongest taste and it's satisfying" (Spain, coastal, male, 31-55 years, fish consumption 2-3 times per week)

"I have never eaten halibut, herring nor pangasius" (Spain, inland, female, >55 years, fish consumption 2-3 times per week)

3.5.4 PrimeFish species

Trout

Trout was recognised by everyone. However, only 11 identified trout as a species consumed at least occasionally, but they were very familiar with the species. Associations were very divers, but main

associations were origin (river). Main likes were taste and a few mentioned convenience or easy to cook as well. Frequent dislikes were bones which disincentive the consumption. Boring taste, price or aquaculture origin was also mentioned by a very few.

Trout was consumed once a month by five respondents, and 3-4 times a year by six persons. Majority claimed their consumption of trout had decreased, but a few had increased their consumption. The trout was usually prepared fresh, whole and consumed at home for everyday meals. This dish was consumed by all household members in most cases.

Trout was equally bought at fish market, fishmonger, super market or hyper market. Usually the purchase was not planned, was bought as substitution or to increase variety in species consumed. Main substations were salmon and anchovy.

No positive buzz, but negative buzz was mainly related to the supply of the species (is decreasing).

Typical verbatims

"Orange, skin, smell, my mother cooks it" (Spain, inland, female, 31-55 years, fish consumption 2-3 times per week)

"Boring taste" (Spain, inland, female, 31-55 years, fish consumption 2-3 times per week)

"I don't consume aquaculture trout" (Spain, coastal, male, >55 years, fish consumption 2-3 times per week)

Herring

Herring was only recognised by 11 of 18 respondents. Only four identified herring as a species consumed at least occasionally, but were not very familiar with it. Associations were small, tradition and salt. Herring was liked because it was easy to cook, but disliked for the strong taste.

This species was very rarely consumed. It was consumed at home and bought canned for daily occasions. It was only consumed by one person in two of the four households. It was bought at the supermarket, and the purchase was not planned, and was used to substitute anchovy.

No buzz, neither negative nor positive was mentioned for herring.

Typical verbatims

"I have never eaten it, I've seen it salted or canned" (Spain, inland, male, >55 years, fish consumption 2-3 times per week)

"I don't know what fish is that" (Spain, coastal, male, 31-55 years, fish consumption 2-3 times per week)

Salmon

Salmon was recognised by everyone and majority was familiar to it and consumed salmon at least occasionally. Salmon was mainly liked for its taste by most, but healthy properties were also mentioned by a few. Several respondents disliked the smell or strong odour of salmon.

The consumption frequency of salmon was rather high. Several consumed salmon 1-3 times per week, and many 1-2 times per month. Some claimed their consumption had increased while others estimated their consumption of salmon had not changed. Salmon dishes were various, smoked fillets, fresh, whole and grilled was very popular, and a few mentioned sushi. Usually salmon was consumed at home, most often as daily meals. In half of the households, salmon was consumed by all members, but by only 1-2 members in other households.

Salmon was most often purchased at supermarket, but also at fish monger. In a few cases, salmon was bought at the fish market. Main criteria for choice of purchase was taste, but also omega-3 (healthy), and convenience (easy to cook). Main substitutions were hake, tuna and megrim.

No negative buzz was mentioned for salmon, only positive, related to emphasis on how healthy salmon was in advertisements, but also health comments from family.

Typical verbatims

"We also eat by our eyes, the colour is important" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"Strong taste" (Spain, coastal, male, >55 years, consumption 2-3 times per week)

"Singular taste, grilled, sushi, smoked, Omega 3" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"Fatty, delicatessen" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"There's a lot of publicity on salmon" (Spain, inland, male, >55 years, consumption 2-3 times per week)

"My children like it" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"For me, there's no substitute, because of its taste. Not even other kind of food" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

Sea bass

Sea bass was recognised by all respondents and majority consumed the species at least occasionally, and most were familiar with the species. Main associations were oven, restaurant and Christmas. Most respondents liked the taste of sea bass, or texture. A few mentioned in this context special occasions. A few disliked the price (wild and fresh expensive).

Sea bass was not frequently consumed. A few consumed it once a month, but others 3-4 times a year or less frequently. Most considered their consumption of sea bass unchanged, but a few had increased their consumption of this species, and one decreased. Sea bass was most commonly bought fresh, whole. Main recipes were baked with potatoes and onion or salt-crusted. This species was not seen as every day fish, and it was usually consumed by all household members. It was suitable both at home and at restaurants, often at weekends or during special occasions.

For home meals, sea bass was most often purchased at supermarket, but also at fish monger and occasionally at fish market. Main criteria for purchase was taste, easy to cook and special occasions. Sea bass would mainly be substituted with sea bream, red or white bream.

No buzz, neither positive nor negative was mentioned for sea bass.

Typical verbatims

"The wild caught sea bass is very expensive" (Spain, coastal, male, 31-55 years, consumption 1 times per week)

"Tasty, not so healthy, salt, limited recipes" (Spain, inland, male, >55 years, consumption 2-3 times per week)

"We just consume it on special occasions" (Spain, coastal, female, 18-30 years, consumption 2-3 times per week)

Sea bream

Sea bream was recognised by all respondents, and 16 consumed the species at least occasionally and most of them were familiar with the species. Main associations were vegetables and aquaculture. The respondents mainly liked the taste and texture of sea bream and how easy it was to cook and consume it. A few disliked bones and found it difficult to consume, and disliked smell when cooking.

Sea bream was consumed 1-2 times per week by several respondents but less frequently by others. Most claimed their consumption of the species had not changed, a few had increased the consumption and one consumed sea bream less frequently. Sea bream was usually bought fresh, whole. Main recipe was baked with potatoes and onion, but a few also mentioned salt-crusted or grilled sea bream. It was most often consumed at home, but also at restaurants. This species was equally used for special occasion and daily meals. It was usually consumed by all household members.

Sea bream was equally purchased at fishmonger and at supermarket, and by a few at fish market. Main criteria for choice of purchase was quality-price relation or special occasions. This species was either not substituted or by seabass/bream or megrim.

A few respondents mentioned negative buss about sea bream related to aquaculture practices.

Typical verbatims

"Holiday" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"Easy to eat" (Spain, inland, male, >55 years, consumption 2-3 times per week)

Cod

Cod was recognised by everyone and majority consumed it at least occasionally and was familiar with it. Main associations were Portugal, taste, holidays and delicious. Majority liked the taste, but many also mentioned it was easy to consume and cook. A few mentioned they liked taste of cod. Dislikes were few, only related to salt content which a few considered too strong (too salty).

Cod was rather frequently consumed, most consumed it 1-2 times per month, or several times per year, but a few 1-2 times a week. Several claimed their consumption of the species had remained stable or increased, while a few had decreased their consumption. This species was most often bought fresh, whole and salted or filleted and desalted. Cod was more frequently consumed at restaurants, although it was also consumed at home. It was equally used for special occasions or weekend and week day meals. A few respondents had cod during Christmas time (tradition in the coastal area). Usually all household members consumed the species.

Most often, cod was purchased in Deli shops (Delicatessen, i.e. specialized shops on cod and/or franchises), or at fishmonger. A few purchased cod in supermarket. Main criteria for choice of purchase was taste and special occasion. Easy to cook was mentioned by one respondent. Either cod was substituted by hake or could not be substituted.

As a positive buzz, wide variety of possibilities for cooking was mentioned by a few, only one mention decrease in stocks (negative buzz).

Typical verbatims

"Croquette, it has a strong taste" (Spain, coastal, female, 31-55 years, consumption 2-3 times per week)

"Specialized shop that only sells salted cod" (Spain, coastal, female, 31-55 years, consumption 2-3 times per week)

"Portugal" (Spain, coastal, female, 31-55 years, consumption 2-3 times per week)

"Salted, traditional, variety of recipes, taste, everybody likes it" (Spain, inland, female, >55 years, consumption 2-3 times per week)

3.5.5 Perspective

Effect of interview on the respondents

Many of the Spanish respondents claimed the interview did not have any influence on their views and fish consumption. Eight considered it might increase their fish consumption, and they were more aware of more variety of species (remembering some forgotten species).

Change in fish consumption during the last 5 years

Most claimed their fish consumption had increased the last five years, while a few considered it to be similar as before.

Future fish consumption

Majority estimated their fish consumption was likely to increase, and low prices would be the main driver for increased consumption.

Typical verbatims

"I eat more fish because it's healthy" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"As I'm old, I might have to change my consumption in the future due to health issues" (Spain, coastal, female, >55 years, consumption 2-3 times per week)

"1 kilo of meat is more filling than 1 kilo of fish" (Spain, coastal, male, 18-30 years, consumption 2-3 times per week)

"Price is higher to other food categories" (Spain, inland, female, 31-55 years, consumption 2-3 times per week)

"Not even salmon can substitute canned tuna" (Spain, coastal, female, 31-55 years, consumption 2-3 times per week)

3.5.6 Overall conclusion

The results of the qualitative study were mainly in line with the trends described in the food status reports prepared by the Spanish ministry. In particular, the place of consumption, the product preferences and the place of purchase were similar in both studies.

Overall, with regard to general consumption, respondents consumed meals at home together with other family members. "Pleasure" and "health" were the most important attributes for the role of food in life. The key attributes for fish and meat products were appearance and origin, consumed mainly fresh. Fish and meat were both perceived as main sources of protein but seafood more expensive, but healthier and lighter. The respondents were generally rather unlikely to substitute meat or fish products. Butchers or fishmonger shops (including fresh food markets), were most commonly used to buy fresh food followed by supermarkets.

Vendors were the most trusted source of information and the respondents claimed media (e.g. TV, internet) did not influence their food consumption. However, they recognized they were well aware of consumption recommendations (e.g. omega-3 properties of fish, freeze fresh fish to avoid anisakis).

The majority of the respondents consumed fish 2-3 times per week and considered themselves average fish consumers. The range of consumed species was very wide. Fish was considered to be convenient, healthy and tasty. On the contrary, smell when cooking and high prices in relation to meat, were the main barriers for fish consumption.



The most preferred place of purchase was fishmonger (including fresh food markets). Supermarkets and hypermarkets were also preferred. Online shopping was the least preferred, followed by organic and deli shops.

The Spanish respondents mainly used fresh fish product. However, inland respondents usually froze the fish at home before consumption. Frozen were bought as well, but mainly frozen hake, followed by canned products (tuna), salted (for cod) and smoked (salmon). The respondents did not like ready-to-eat, processed and/or breaded fish products. Purchase was usually planned in advance. However, the surroundings and vendors advises influenced final decisions of purchase. The most important criteria for fish purchase was freshness and appearance, followed by price and sellers advises. Reputation and additives were not identified as relevant purchase criteria. The main fish substitution products were meat-based due to protein content, followed by pulses and vegetables because of nutritional value and easiness to digest.

The selected PrimeFish species (trout, salmon, seabass, seabream, cod and herring) were well known by the Spanish respondents with the exception of herring. In general, they were consumed at home, purchased whole and fresh.

The consumption frequency of **trout** was rather rare and the consumption frequency was decreasing. Bones were the main barrier for its purchase. Anchovy and salmon were the major substitute products. **Herring** was very rarely consumed, or never. Canned anchovies were the main substitute, however herring was not a product widely available in the Spanish shops. Consumption of **salmon** was rather frequent and was slightly increasing. It was mainly liked for its taste but also health properties. It was mainly consumed as every day dish, either grilled (fresh pieces) or smoked (fillets). Main substitutions were tuna (for smoked) or hake and megrim (for fresh). **Seabass** and **Seabream** were both liked for their taste and texture and purchased fresh and whole in supermarket. The consumption of seabass was occasional, but more seabream was consumed more frequently. The consumption of these species was stable or slightly increased. These species were usually oven cooked, often for special occasions. Seabream was associated to aquaculture and considered more convenient than seabass. The species were substituted by each other. **Cod** was rather frequently consumed and the consumption frequency was slightly increasing. Cod was appreciated for its taste and way of preparation and consumption. It was most often purchased salted or fresh and unsalted in specialized shops. Its consumption had cultural relevance with the coastal respondents due to its relation with Portuguese traditional food and its influence on border regions. A few substituted cod by hake.

Seafood had a positive image based in its nutrient content, being a light food and having a healthy image. In general, Spanish consumers have a tradition for meat and seafood purchase and consumption habits. The PrimeFish species, cod and salmon, were the most relevant in terms of daily consumption followed by seabass and seabream, most preferred for special occasions.

4. General discussion

4.1 France

In general, France consumers may be considered “gourmet” consumers who place major emphasis on the joy in food consumption. A large variety of seafood product in France can be considered gourmet seafood. Elderly consumers in France spend almost double the amount per month as compared to younger consumers. Roughly half of the French population believes that their food budget is constantly increasing. Simple dishes were mostly preferred for weekdays, but during the weekends, the dishes were more sophisticated.

Products and product format, fish in general. Generally, older respondents preferred fresh fish and frozen and ready-to-eat products were rarely bought by this age category. Younger people prefer canned, smoked or frozen fish, mainly due to their low income and lack of knowledge and experience for buying fresh fish. Smoked, canned and cello wrapped were also used.

The **most important attributes for fish in general** was freshness. Other important attributes were colour (e.g. salmon) and origin (majority avoided fish from far away/outside of Europe and coastal respondents preferred local fish). Production method was also very important and majority preferred to buy wild fish although the choice was usually determined by the price. Because of negative news about farmed fish, information about farming was wanted and organic farming was preferred. Brand and certifications for fish were not considered important when buying fish.

Main **motives** for consuming fish were that it was perceived as healthy, good for weight control and nutrients. It was considered simple, easy and convenient to prepare, offer variety in recipes and go well with a lot of foods.

Main **barriers** for fish consumption was price, bones and smell. Shelf life is short. Negative press was also considered a barrier, such as bad image of farmed fish according to TV reports, animal welfare issues, overcrowded cages and bad feed containing antibiotics, especially for salmon and trout. Wild fish received negative press as well, due to polluted oceans, bycatch and overfishing.

Generally, the intensive farming appears to be becoming a strong argument for not consuming fish, although the most important reason is the high price. For young people with low income, the second big barrier after the price is the lack of knowledge for buying and cooking fish (it seems to be much more complicated than cooking meat). However, the positive reasons push them to eat some fish at least monthly: a source of good fats, good for memory, lighter than meat etc.

Generally, people rather tended to notice and remember negative **information about fish**. The majority of information about fish, either positive or negative, came from media, mainly TV, internet or magazines. Young people frequently saw small articles on internet (passive information). Families and friends were considered a source of good information about fish. Kids were motivated to consume more fish because of the nutrients it contained.

Scandals about fish were mainly related to intensive farming, antibiotics in salmon feed, junk food in fish feed, overfishing, mesh size of fishing net and bycatch.

The French respondents mentioned wide variety of campaigns or recommendations, related to eat local, eat seasonal products, eat bio/organic, eat varied, lower the consumption of animal proteins (less meat and/or fish), do not consume fish more frequently than two times per week (National Department of Health campaign). In addition, nutritional information on packaging spoke out to respondents such as information like “rich in omega-3” (for canned fish) or “contains 25% less salt” (for smoked fish) which were appreciated. Crustaceans are very good for health but expensive.

Several respondents claimed they were more affected by the negative information (TV or internet usually) they received about fish. Several consumers reduced consumption of salmon (negative news of salmon farming in Scotland and Norway) while others did not change their consumption frequency but paid more attention when choosing fish, avoided certain provenances or bought farmed salmon with bio labels. One reduced fish consumption based on negative information from the national Department of Health about the mercury content of fish.

The consumption frequency of **trout** was occasional and the consumption frequency was stable or slightly increasing. The French respondents were not very familiar with the species. It was mainly liked for its taste and appearance. Bones were the main barrier for its purchase, but also industrial, farmed, seeing the head and taste. The most common product was smoked fillets, but also whole and raw fillets. **Herring** was very rarely consumed and most considered their consumption rare but stable. Familiarity was low, but the main products were smoked, salted, fillets. Herring was considered good for health, but either liked or disliked for its strong taste. Barriers could also be considered to be low familiarity and very rare availability. **Salmon** was very popular, rather frequently consumed and liked for its various preparation possibilities and taste, but main dislikes were farmed and fat. It was associated with origin (Norway), wild or farmed and health properties. It was usually purchased fresh or smoked, whole or fillets, for everyday or festive occasions. **Sea bass** was generally rather unfamiliar, was considered a luxury fish, farmed or wild and liked for its taste and texture. Only the price was disliked. It was bought whole or as fillets. **Sea bream** was not well known, although more than sea bass. It was liked for its taste and texture, but disliked for bones. It was used for both every day and festive occasions. It was more frequently consumed during summer period. **Cod** was rather well known and rather frequently consumed. It was liked for its taste and texture, but disliked for smell and bones. Main concerns were overfishing. It was purchased as raw or frozen fillets, more for everyday use.

Increasing the fish consumption is desirable by the majority of respondents; an important determinant would be the decrease of prices and complete information about traceability.

4.2 Germany

According to recent market studies, it is clear that for German consumers, origin, sustainability, traceability and organic production is of high importance, and in general they are well aware of certification labels in relation to this. Future trends are expected to be fresh fish in fish counters (supermarkets), modern availability (e.g. MAP) and take-away fish. Use of ready-to-cook and ready-to-eat meals tends to increase although cooking is also a trend, mainly among younger generation. Local

culinary traditions remain high e.g. herring products are more used in North Germany than in the south region.

Products and product format, fish in general. Majority consumed smoked fish, fresh and frozen fillets, canned fish and pickled/salted herring. Several also consumed breaded fish or fish sticks, vacuum packed seafood. Very few mentioned sushi, fish cakes and ready-to-eat meal. Reasons given why products were not consumed were related to lack of freshness (surimi, vacuum packed or frozen), processing or ingredients (surimi, ready to eat meals, fish paste), sensory attributes (taste and texture of surimi, taste of canned fish). Different type of fish products were consumed on week days and weekends. Seafood salads were rather consumed during week days but fillets and smoked products on special occasions (meals with friends, family, restaurant visit).

The **most important attributes for fish in general** were price, freshness, taste and appearance, as well as origin and certification and brand, traceability, and no additives, wild caught. A few also mentioned convenience. Overall, fish was considered healthy and could be used more frequently, freshly prepared, frozen was a compromise. It was generally considered to be something special where higher price had to be paid for better products. Main **motives** for consuming fish was taste. Health and different nutritional benefits motivated fish consumption (digestible, no antibiotics, good fatty acids, protein, mineral nutrients, low fat), as well as well-being (life quality, good feeling, not heavy as meat), reduction of meat consumption, and routine. The most common **barriers** to fish consumption were overfishing (threatened species), and conditions and bad reputation of aquaculture species (pangasius, breeding conditions), pollution (nanoplastis, heavy metals, Fukushima), nematodes and hygienic conditions in sushi, intolerance/allergies. Poor availability (inland, fresh fish, good fishmongers) was likely to be a barrier for fish consumption as was price. None of the mentioned barriers were of major influence but the respondents felt more strongly towards pangasius (consumption mostly never), shrimps from Asia, aquaculture condition (preferred to buy wild or organic produced salmon) and low availability of (some) fresh fish (more frozen and smoked products).

The German respondents were well aware of various positive and negative **information about fish in general**. Main positive information about fish was first of all that it could be considered to be a meat supplement. Fish was healthy and has positive effects on cardiovascular diseases. Fresh frozen fillet from trawlers were considered quality fish (less microbial contamination, long line, certificates). Further, that herring stock had taken a leap in evolution, and breeding age was earlier. A lot of positive press was related to aquaculture, where fish breeding/ aquaculture was positively presented, including plans to establish fish farms at the high-sea to overcome overfishing problems and with better husbandry conditions than in conventional aquaculture. Norwegian fishery was considered comparatively better with more sustainable practice than other fisheries. Positive press about "Iгло" (German brand): freshly caught fish directly deep-frozen was also mentioned.

Main negative topics were about overfishing (cod). More negative information related to catch included illegal fishing, fish mortality, sustainability, catching conditions of tuna, spiny dogfish and sharks. Fish farms were not environmentally friendly. Pangasius was a never buy based on negative press (additives, drugs, aquaculture environment). Negative evolution in both wild catch and aquaculture, related to pollution of the sea, aquaculture/industrial farming, bad conditions, was resulting in less healthy fish compared to before. Fish waste, nematode problems (long ago), sushi as

raw fish (would not eat). Short shelf life because of weak cold chain management. Wild fish was associated with bad press regarding plastic contaminants, heavy metals and overfishing.

The consumption frequency of **trout** was once a month or more frequently among half of the respondents, had increased slightly. Trout was generally a familiar species and was mainly liked for its flavour and texture and preparation methods, but main dislikes were bones. Freshness and appearance were main criteria as well as location and weather for barbeque. It was consumed more during summer, and more often for special occasions but also every day meals. Main barriers were bones, appearance, taste and whole fish. It was purchased whole, or as fillets (fresh, frozen, smoked) or whole smoked. It had generally positive image. **Herring** was very well known, familiar and consumed at least monthly by majority of respondents. It was mainly liked for taste and texture, and only a few mentioned small bones (negative). It was seasonal for several respondents, more frequently consumed during summer, mainly at home but sometimes at restaurants. Criteria for choice of purchase was most often based on brand name or label (MSC) and freshness (which was often based on trust in fishmonger), no or few additives and appearance. Main products were ready-to-eat herring or matjes salad, mild salted or pickled fillets, canned "Rollmops" marinated fried herring, fresh fillet and whole herring and cold-smoked "eel-style" herring. **Salmon** was very well known and frequently consumed by many and liked for its taste and texture, health properties and good farming conditions. Main attributes were freshness and appearance, origin, certificate and brand. Few dislikes were mentioned, mainly texture and negative aquaculture conditions. Main products were fresh and frozen fillets, vacuum packed and smoked. It was mainly used for everyday meals. Familiarity of **sea bass** was low, and most did not have any experience with it. It was liked for taste but lack of availability was a main hurdle. Criteria of purchase would be offer and freshness and it was mainly bought fresh, whole or as fillets. Familiarity with **sea bream** was generally low. Main likes were taste and texture, and criteria of choice was freshness and appearance, but a few mentioned price. Dislikes were mainly many bones, elaborate preparation and poor availability. Sea bream was usually bought fresh as fillets or whole, or as frozen fillets. **Cod** was usually well known and mainly liked for taste and texture. Main criteria for purchase was freshness, appearance, certificates (MSC), origin or additives (fish sticks). Very few disliked anything about cod, mainly texture, but concerns were expressed about pollution in Baltic sea, additives (processed sticks) and overfishing. Main products were fresh whole, fresh and frozen fillets.

Generally, fresh fish was preferred but availability or ease of access was a hurdle. The main reason may be lack of time, as the respondents claimed they did not have the time to go where fresh fish was available (outside markets or local fish mongers). Therefore, more frozen and smoked products were consumed.

Overall aquaculture has not a very good reputation, especially conventional and Asia aquaculture. Most of the respondents rejected especially pangasius but also other fish and seafood (prawns) from Asian aquaculture. However, increasing range of organic and sustainably produced fish has led to more positive experience of consuming fish via better conscience among some respondents. This is not least true for salmon where negative news regarding breeding conditions and feeding has resulted in that some respondents only eat wild or organic produced salmon.

Wholesomeness of fish is the main advantage of many fish species, mainly among females and older respondents. In addition, fish was generally perceived as saturating and good quality dish or take-away, although availability of fish fast food was found to be insufficient among males.

4.3 UK

Fish consumption increased in UK, driven by growing awareness of the health benefits of seafood and lower prices, up to the year 2007 when it decreased again due to the economic recession. Chilled natural in particular, is seen by shoppers as a high quality and healthy choice, whilst prepared seafood addresses many of the seafood barriers to consumption. Only chilled seafood segment was in growth in recent years and tuna was ranked number one in retail by volume, but has significantly declined, affected by rising production costs and sustainability issues hitting the news. By the end of 2015 salmon displaced tuna as the top seller in terms of volume.

Products and product format, fish in general. Form of product is an important consideration as most respondents would only buy fresh/frozen fillets of different species, but would never buy whole fish, surimi, soup and sushi. The most common form of products was canned (tuna/mackerel), fresh fillet vacuum packed or cello wrapped (for salmon and cod, haddock), natural or breaded fresh or frozen fillet (cod, haddock), processed/transformed – fish fingers and burgers. Whole fresh fish at the one end and surimi at the other were not popular among most of the respondents. Whole fish would be purchased typically by older people who have experience in handling it.

One of the **most important attributes for fish in general** was price for most UK respondents. Those who didn't consider price so important were usually not the affluent but those who had food satisfaction and enjoyment as a high priority. They would be able to pay more for a perceived better 'experience'. Brand was mentioned by a few as important but nutritional information on packaging was not of importance, nor was origin and none of the respondents would mind if the fish was imported. Health was important, but mainly as a form of product (e.g. natural, no additives). Environment/ethics was considered important especially among younger and well educated people who were aware about fish stocks and methods of fishing. The Dolphin Friendly certification was the most commonly recognized but rarely MSC. Certification was generally not important (only for educated people), apart from the organic and Fairtrade certification, almost only Dolphin friendly and Line and Pole would be recognized for tuna. Generally wild fish were preferred to aquaculture species. Freshness was important and that the products looks fresh, and there are no signs of spoilage.

Overall, there was a very limited knowledge on fish farming vs fishing and what is better, but on the whole wild fish were preferred. In terms of ethics, on the whole fish was not seen as equal to animal because it is less sentient and cannot 'make your friend'. Furthermore, people had limited knowledge on sustainability so certification for fish in general was not so important, although it is becoming more so as younger people are becoming more involved and aware of issues with fish stocks and fish farming.

Main **motives** for fish consumption, were positive health effects and good flavour. Fish is low in calories so good for maintaining weight and almost all were aware of omega 3 fatty acids. Depending on the species and product seen as convenient and versatile. Main **barriers** were price and smell. Too strong taste, of especially herring, but too weak taste, of especially cod. Bones were a problem for mostly younger people, but availability was a barrier for older generations. Negative image for farmed fish may be a barrier sometimes.

Generally high frequency fish consumers were those seeking most **information about fish in general**. Intensive farming was mentioned on a few occasions although on the whole the knowledge of participants was very limited when it came to aquaculture and whether it was good or bad. Fish stocks were considered overfished, but cod stock recovery was mentioned as something positive by a few respondents. All participants were aware and had heard (from everywhere) that fish was healthy to eat. In general, there was not much information participants were aware of from the media, much less than other food categories and there was very limited knowledge on campaigns and recommendations. In a couple of cases the consumption of seafood was influenced by celebrity chef TV shows and cooking course.

The production methods in aquaculture were generally seen as negative because of “feeding with chemicals”, overcrowding, sea lice. However, the respondents were not sure about the details.

Majority was familiar with smoked **trout** but were not familiar with fresh trout. It was mainly liked for its appearance, colour, good and light taste and content of omega-3. Criteria for choice of purchase would be freshness and price. Main dislikes were taste, and a few mentioned mouldy taste in that respect. It was not widely available. Almost all respondents mentioned bones in relation to what the disliked about trout. Trout was mainly purchased whole or as smoked fillets. **Herring** was generally unfamiliar and very rarely consumed. It was liked for taste and texture in case of pickled herring, but otherwise only omega-3 was mentioned. Dislikes were taste, smell and bones. It was consumed cold (when pickled) or in oven or boiled when smoked (kippers). **Salmon** was familiar and rather frequently consumed, either as every day meal or during special occasions. Respondents mainly liked the taste, texture, versatility of cooking and ease of cooking salmon but disliked high price and farmed. Criteria for choice of purchase was freshness and origin and main products were fresh fillets and smoked fillets. **Sea bass** was rather unfamiliar and rarely consumed. Respondents mainly liked the taste but disliked the price. Criteria for choice of purchase was price and availability. Bought as fillets or whole. **Sea bream** was unfamiliar and very rarely consumed. Taste and texture was liked but no remarks were made about dislikes of Sea bream. Either fillets or the whole fish was purchased. **Cod** was well familiar and rather frequently consumed. Taste and texture was liked, but taste was also mentioned as what was disliked. Overfishing was a concern as well. Main criteria for choice of purchase was freshness. Cod was usually purchased as fresh or frozen fillets.

4.4 Italy

Fisheries have a strong tradition in Italy and play a central role in the social and cultural environment of the communities located close to the sea. Recent data showed a general decrease in fresh fish consumption in Italy until 2013 with the exception of salmon. However, compared to many European countries, fish consumption was high in Italy and the respondents estimated their fish consumption had increased during the last five years (mainly as fish is increasingly used as a healthy substitute to meat). Factors which could induce an ever higher consumption were mainly related to health and price aspects, but also “new” fish species or experimentation with new recipes.

Products and product format, fish in general. Fresh fish was by far the most preferred type of products. Frozen, canned (mainly tuna and salmon), salted, and smoked were also rather popular. Only few used sushi, breaded sticks and dried formats with no particular distinctions.

The single most **important attributes for fish in general** was freshness. Quality was very important as well and respondents were not willing to trade off quality against lower prices, but they might vary the species to save money. Younger respondents were more price concerned. Origin was considered really important for half of the respondents. Trust in salespersons was important for fresh products and brand for processed or frozen. Many also mentioned certification, which in Italy is also origin/provenance. Main **motives** for fish consumption were health related qualities of fish, such as healthy, omega-3, good fats good nutrition, light and easy to digest. Several also found cooking (easy to cook and versatility) and taste to be a motive. A few mentioned availability of fresh products, seasonality and discounts/offers and tradition. **Barriers** for fish consumption were generally few but a few, especially younger respondents, mentioned bones. Very few found fish meal preparation difficult, price, farming concerns (animal feed, life conditions).

Information about fish in general. Main sources of information about fish were via journals, TV, newspapers, friends and family, publicity in general and social networks. Overall, fish has a positive image, more positive than meat, lighter and healthier. Information received about fish in media, was though more negative than positive, or at least rather remembered. Heavy metals in big fish, and mercury contamination was mentioned by majority of the respondents. Negative press was also regarding animal feed and usage of antibiotics in aquaculture and general negative news about farming and origin of Pangasius. Mussels and shellfish that live in dirty waters, tuna from China with no controls/less regulations, debate between fishing and aquaculture, and news about intense catches. However, positive information was recollected as well, such as sustainable fishing, but main positive press was related to fish being good for health and good for memory.

Several were affected by such information or changed their behavior based on information about fish. In some cases, negative press has led to reduction in consumption, in other more extreme cases they quit the consumption of some species or products. Others stated they were not affected by negative press and considered information in press not reliable. Mass information could be destructive campaigns against certain some food categories.

Trout was a very familiar species, but generally not liked and very rarely consumed. Main criteria for choice was freshness and origin. Main barriers were taste, not sustainable and farmed. Most common form was whole fresh fish. **Herring** was the least known and consumed species, mainly because of poor availability in the country, its strong taste, and lack of knowledge in preparations. It was mainly had smoked, salted or dried. **Salmon** was very familiar and very much liked and consumed, both during week days and festive occasions. It was liked for its versatility in preparation, sensory properties and main purchase criteria was freshness and origin (Norwegian, Scottish). Dislikes were few, mainly bones and farming. Fresh salmon was the preferred format, sliced, cuts, fillets but in case of smoked salmon, vacuum packed. **Sea bass** and sea bream were both well familiar and frequently consumed, at restaurants and festive occasions at home. Main likes were availability, easy preparation and good for health and eco-sustainability (in farming), and purchase criteria was freshness and hygiene. Main dislikes were related to taste, fish bones and animal feed in farming. Main products were fresh and

frozen fillets. **Cod** was also a familiar species and rather frequently consumed. It was liked for its availability, easy preparation, healthy fats and taste. Main dislikes were difficult to cook, bad smell, association with street food (fried). Cod was bought fresh, frozen or salted.

4.5 Spain

Spain is one of the largest markets for fish and seafood in Europe due to their overall production capacity but also for consumption reasons. Spanish consumers greatly appreciate fish and shellfish, being the second largest country in consumption per capita along Europe.

Approximately 60% of fish and seafood volume consumed in Spain happens at home and Christmas is a high season for fish consumption in terms of amount and value. Spanish consumers mostly consume fresh fish and other seafood (shellfish, molluscs and crustacean), but less canned and least frozen fish.

Products and product format, fish in general. Fresh fish was preferred by majority of respondents, either whole, as steaks or fillets, but frozen products were also preferred by many. Canned, salted, dried and smoked products were rather popular as well. Ready-to-eat meals and processed fish were the least preferred products. Neither breaded fish nor ready to heat meals were popular.

Important attributes for fish in general. Freshness was the most important determinant for buying fish. Appearance, origin was of importance and price/promotion affected buying decisions as well. Certification/label, reputation and brand could also be an issue. Majority of the respondents were affected by the surroundings when making buying decisions, the advice of the sellers being the most effective. Price was mentioned by a few. Main **motives** for fish consumptions were related to health, mainly due to omega-3. Taste, easy to prepare and consume were considered important as well. The most frequent **barrier** for fish consumption was smell during cooking. Other barriers were short storage time, not filling and expensive in comparison substitute products.

Information about fish in general. Fishmonger was the most trusted source of information. A few considered information found on the internet important and others also highlighted the importance of promotions (users of supermarkets or hypermarkets). The respondents perceived TV as a non-trusted source of information or they felt as there was no information available about fish.

The image of fish/seafood was overall positive, and several related the food category to nutritious and/or healthy, but a few mentioned price as a barrier for fish consumption.

Main information about fish came from media, friends or family. Main negative information was related to scandals such as overfishing of stocks in media, and fish imported from far. Mercury content in fish was an issue and Pangasius farming in polluted environments came from TV and friends. The main positive information about fish was about the healthiness of fish, both from TV and other media. TV cooking programs provided positive information about fish. Majority claimed press did not affect their seafood consumption.

Trout was generally well known and rather frequently consumed. Main likes were taste, convenience and easy to cook. Frequent dislikes were bones. The taste could be boring, and price or aquaculture

origin could be a barrier for consumption also. It was bought fresh, whole. **Herring** was recognised by only few and very rarely consumed. It was easy to cooked as it was canned, but herring was mainly disliked for strong taste. **Salmon** was a very familiar species, frequently consumed. It was mainly liked for its taste, but healthy properties were also mentioned and convenience with regard to meal preparations. Main dislikes were the smell or strong odour. It was usually bought fresh, whole, sliced, or as smoked fillets. **Sea bass** was well recognised and occasionally consumed. It was liked for taste and texture and main criteria for purchase was convenience in preparation and special occasions. Only the price was disliked (wild and fresh expensive). Sea bass was most commonly bought fresh, whole. **Sea bream** was generally well recognised and frequently consumed by some respondents. It was liked for its taste and texture and how easy it was to cook and consume it, often used for special occasions. A few disliked bones and found it difficult to consume, and disliked smell when cooking. It was usually bought fresh and whole. **Cod** was recognised by everyone and occasionally to rather frequently consumed. Majority liked the taste, but many also mentioned it was easy to consume and cook, and could be bought for special occasions. Dislikes were few, only related to salt content which a few considered too strong (too salty). It was mainly bought as whole and salted and fresh, filleted, and desalted.

5. Conclusion

To conclude, the results of this qualitative study in the five important European markets, France, Germany, UK, Italy and Spain, indicated how different these markets were, although several similarities were found in regard to the emphasis placed on fish purchase and consumption. The results both confirmed previous extensive studies on these markets and provided more detailed insights into consumer fish purchase behaviour, motives and barriers for fish consumption, as well as use of new purchasing channels, experience and effects of media treatment of information.

Fish knowledge and interest varied between countries, e.g. in regard to origin and production method. The participants in most of the countries were conscious about negative press, which was most often related to fish farming. Origin of the fish was also expressed as a concern. Generally, seafood has a positive image based on its nutrient content, being a light food and having a healthy image.

Main barrier for fish consumption was price and bones were a frequently mentioned barrier as well. In addition, lack of skills to prepare fish was mentioned. Freshness, health and taste were the main drivers for fish consumption, although taste can also be a barrier.

The use and experience with the five PrimeFish species varied very much between the countries as demonstrated in table 11. It is based on the interview results, summarising the main attributes and barriers for fish in general and specifically for the PrimeFish species.

Table 11. Main attributes, barriers and formats of fish in general and PrimeFish species (trout, herring, salmon, sea bass, seabream and cod)

Country	General fish	Trout	Herring	Salmon	Sea bass	Sea bream	Cod
France	<p><u>Attributes:</u> format fresh (fillet, whole), freshness, origin, wild / farmed, organic farmed, colour, healthy (fats, weight control)</p> <p><u>Barriers:</u> price, bones, smell, short storage, origin Norway for farmed, complicated traceability, labels not known,</p>	<p><u>Familiarity:</u> medium/low</p> <p><u>Attributes:</u> local origin, fresh appearance, taste</p> <p><u>Barriers:</u> industrial / farmed, bones, see head, taste</p> <p><u>Format:</u> smoked fillets, whole raw, fillet raw</p>	<p><u>Familiarity:</u> low</p> <p><u>Attributes:</u> none, good for health</p> <p><u>Barriers:</u> low familiarity, low presence in restaurant</p> <p><u>Format:</u> smoked, salted, fillets</p>	<p><u>Familiarity:</u> medium/high</p> <p><u>Attributes:</u> origin (Norway), wild / farmed, healthy (omega3) preparation possibilities and taste</p> <p><u>Barriers:</u> farmed, too fat, too dry</p> <p><u>Format:</u> raw fresh fillets, smoked, whole</p>	<p><u>Familiarity:</u> medium/low</p> <p><u>Attributes:</u> none, wild / farmed, fine taste, texture</p> <p><u>Barriers:</u> price</p> <p><u>Format:</u> whole, fillets</p>	<p><u>Familiarity:</u> medium</p> <p><u>Attributes:</u> none, taste</p> <p><u>Barriers:</u> fish bones</p> <p><u>Format:</u> whole, fillets</p>	<p><u>Familiarity:</u> medium/low medium high</p> <p><u>Attributes:</u> wild / farmed, taste, origin (Portugal)</p> <p><u>Barriers:</u> smell, bones overfishing.</p> <p><u>Format:</u> raw fillet, frozen</p>

	<p>animal welfare critics (overcrowded , antibiotics) <u>Format:</u> fresh (fillet, whole), smoked, canned, frozen, cello-wrapped</p>						
Germany	<p><u>Attributes:</u> freshness, taste, appearance / colour, price, certificate / label (MSC), origin / traceability, organic, no additives, wild / farmed, health benefit (low fat, omega3, proteins), convenience (easy to prepare), brand (packed, processed) routine <u>Barriers:</u> overfishing, farming conditions (additives, pollution), processed fish, availability, price, bones <u>Format:</u> smoked, fresh fillets, frozen fillets, canned fish, salted. Breaded fish</p>	<p><u>Familiarity:</u> medium/high <u>Attributes:</u> taste, freshness, appearance. Prep methods <u>Barriers:</u> bones, appearance whole fish <u>Format:</u> whole fish, smoked fillets, fresh fillets, frozen fillets, smoked as a whole</p>	<p><u>Familiarity:</u> medium/high <u>Attributes:</u> taste, texture no additives, brand name, freshness, appearance, label (MSC) <u>Barriers:</u> small bones <u>Format:</u> jar fillets matjes, canned, processed (rolled) fillets, fresh fillets/ whole. Cold smoked. Mild salted</p>	<p><u>Familiarity:</u> high <u>Attributes:</u> freshness, appearance / colour, healthy (omega3), taste, texture, wild / farmed, certificate, origin, organic <u>Barriers:</u> farmed (additives, diseases, pollution), overfishing, dry flesh <u>Format:</u> frozen fillets, fresh fillets, vacuum packed fillets, smoked</p>	<p><u>Familiarity:</u> low <u>Attributes:</u> taste, freshness, instore promotions <u>Barriers:</u> low availability <u>Format:</u> fresh fillets, fresh whole</p>	<p><u>Familiarity:</u> medium/low <u>Attributes:</u> taste/texture , freshness, appearance, instore promotions, origin price <u>Barriers:</u> bones, low availability preparation <u>Format:</u> fresh fillets, fresh whole, frozen fillets</p>	<p><u>Familiarity:</u> medium/high <u>Attributes:</u> freshness, appearance, certificates MSC, origin, no additives, <u>Barriers:</u> bones, pollution Baltic sea, additives (processed sticks), overfishing <u>Format:</u> fresh fillets, fresh whole, frozen fillets</p>
UK	<p><u>Attributes:</u> price, health (natural, no additives, low calories, omega3), environment / ethics, brand, organic and Fairtrade certification,</p>	<p><u>Familiarity:</u> low <u>Attributes:</u> appearance / freshness, colour, price, omega3 <u>Barriers:</u> bones, farmed mouldy</p>	<p><u>Familiarity:</u> low <u>Attributes:</u> taste and texture none, omega3 <u>Barriers:</u> strong taste, smell bones <u>Format:</u> smoked.</p>	<p><u>Familiarity:</u> high <u>Attributes:</u> taste, texture, easy to cook, wild / farmed, healthy (omega3) origin</p>	<p><u>Familiarity:</u> low <u>Attributes:</u> taste. availability <u>Barriers:</u> price <u>Format:</u> fillets or whole fish</p>	<p><u>Familiarity:</u> low <u>Attributes:</u> taste, texture <u>Barriers:</u> price <u>Format:</u> fillets or whole fish</p>	<p><u>Familiarity:</u> high <u>Attributes:</u> taste, texture, freshness <u>Barriers:</u> weak taste, overfishing <u>Format:</u> fresh or frozen fillets</p>

	wild/farmed, freshness (day of catch, used before..), eco-certification (tuna fish) wild/farmed taste <u>Barriers:</u> price, smell, bones, farmed, unavailability <u>Format:</u> fresh whole, fresh fillets, frozen, smoked	taste availability <u>Format:</u> whole fish, smoked fillets	Pickled herring	<u>Barriers:</u> farmed, price <u>Format:</u> fresh fillets, smoked			
Italy	<u>Attributes:</u> freshness, certified origin, brand for processed / frozen, healthy / omega3, trust in producer / salesman, promotion, wild / farmed Availability, season, tradition <u>Barriers:</u> price, fish bones, cooking difficult, farming concerns. Price <u>Format:</u> fresh, frozen, canned, salted, smoked	<u>Familiarity:</u> high <u>Attributes:</u> wild / farmed, freshness, origin <u>Barriers:</u> dislike taste, not sustainable farming <u>Format:</u> fresh whole fish	<u>Familiarity:</u> low <u>Attributes:</u> none, taste/healthy <u>Barriers:</u> limited consumption, difficult to find it <u>Format:</u> smoked, salted, dried	<u>Familiarity:</u> high <u>Attributes:</u> origin Norway / Scotland (smoked), colour, freshness (fresh), versatility in preparation <u>Barriers:</u> farmed, bones <u>Format:</u> fresh (raw, sliced), smoked (vacuum), less frequent frozen	<u>Familiarity:</u> high <u>Attributes:</u> freshness, eco-farming, health (light), taste <u>Barriers:</u> taste, fish bones, farming feed and pollution <u>Format:</u> fresh, fillets (also frozen)	<u>Familiarity:</u> high <u>Attributes:</u> freshness, eco-farming, health (light), taste <u>Barriers:</u> taste, fish bones, farming feed and pollution <u>Format:</u> fresh, fillets (also frozen)	<u>Familiarity:</u> high <u>Attributes:</u> easy to cook, healthy fats, taste <u>Barriers:</u> bad smell, difficult to cook <u>Format:</u> fresh fillet, frozen, box, salted,
Spain	<u>Attributes:</u> health (highlighting omega 3 properties), taste, easy to eat/digest, easy to cook, Freshness, appearance, Seller advices, Price <u>Barriers:</u> Fish forms, reputation	<u>Familiarity:</u> high <u>Attributes:</u> taste, convenience, easy to cook. <u>Barriers:</u> bones, "boring" taste <u>Format:</u> fresh and whole fish	<u>Familiarity:</u> very low <u>Attributes:</u> easy to cook (canned) <u>Barriers:</u> Strong taste (salted) <u>Format:</u> canned	<u>Familiarity:</u> high <u>Attributes:</u> taste, healthy properties (omega 3) and convenience <u>Barriers:</u> smell and strong taste <u>Format:</u> Fresh, whole and sliced as	<u>Familiarity:</u> high <u>Attributes:</u> taste, texture, easy to cook (ideal for a special occasion) <u>Barriers:</u> price (specially the wild)	<u>Familiarity:</u> high <u>Attributes:</u> taste easy to cook (ideal for a special occasion), texture, <u>Barriers:</u> smell when cooking and bones <u>Format:</u> Fresh, whole	<u>Familiarity:</u> high <u>Attributes:</u> taste, easy to cook/eat and texture <u>Barriers:</u> strong taste (too much salt) <u>Format:</u> whole and salted and fresh,



	and additives, smell when cooking, expensive products in comparison to their substitutes, perishable product, parasites Format: Fresh (whole, stakes, filets), frozen and canned. Salted, dried			well smoked fillets	as	Format: Fresh and whole	filleted and desalted
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The PrimeFish focus fish species were recognised by participants in all five countries although participants' knowledge of the species varied by country. Salmon and trout were generally the species the participants were most familiar with, but herring the least recognised, except in Germany where herring was familiar and traditional.

For further analysis of these five important markets in Europe, in quantitative studies, it is of value to include the main attributes identified in this qualitative study. In this respect, overall, freshness was considered an important attribute for fish as were health properties. This could include the consumer value of nutritional and health claims, and date of catch. Other attributes identified of value in these qualitative studies were production method (farmed or wild caught) and origin (local, European or outside of Europe). The use of different formats varied considerably between markets, from whole to processed products for the different species, as well as readiness of consumption at purchase. Respondents in some of the markets, especially in Germany, were more concerned about sustainability, environmental issues and traceability than respondents in other markets, such as in UK.

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Appendix 1 Recruitment guide

RECRUITMENT GUIDE (don't mention any context to fish)

Name _____

1. What is your gender?
 - a. Male
 - b. Female

→ Check quotas
2. What is your age? (open question)
→ Check quotas
3. Where do you live? _____
(please check if a or b)
 - a. Inland location (less than 50km – ½ driving from coast)
 - b. Coastal location (more than 50km – ½ driving from coast)? Inland

→ Check quotas
4. Do you live in ...
 - a. Urban area
 - b. Rural area

→ Vary profiles
5. What is your profession? (open question)
(if not clear, ask... Are you (or any member of your household) working in the food sector / agri-food sector (production, distribution, of food) or in the marketing sector?)
 - a. Yes (then STOP) ■
 - b. No
6. What is your highest educational level?
 - a. University degree
 - b. high school graduation (for university entrance)
 - c.
 - d. lower school ... please adjust

→ Vary profiles
7. You are...
 - a. Employed full/
 - b. part time employed
 - c. Unemployed
 - d. Housewife / Houseman

→ Vary profiles
8. What is the total number of persons composing your household? (open question)
9. If children living at home: how old are they?



- a. Child 1 ...
- b. Child 2 ...
- c. Child 3 ...

10. → If it is preferred to ask directly the amount of the household income, if possible _____ €

→ In order to be recruited, the participants (**women or men**) must satisfy at least 2 (but it's preferable 3) criteria, i.e. :

- eating fish + shopping for food
- or eating fish+ cooking/preparing meals
- or eating fish + cooking/preparing meals + shopping for food

	11. Who goes usually for food shopping in your household?	12. Who is usually in charge of cooking/preparing the meals in your household?	
Me			One must be selected
My partner			
Me and my partner			
The children			
All the family			
Others (then who?)			Allowed ?

13. Regarding food/meals, are you or any members of your family on a special diet or have allergies (vegans, vegetarians, restrictive diet, etc...)?

- a. Yes (**If yes, check how the diet is specific and try to figure out if it is compatible with the survey**) _____
- b. No

14. Do you personally eat.....

	very frequently	frequently	seldom	not (Why ?)
Meat				
Tofu				
Eggs				
Fish/seafood				

--	--	--	--	--

15. please define very frequently or frequently fish consumption, is it:

- a. Every day or almost every day
- b. 2-3 times a week
- c. 1 time a week
- d. 2-3 times a month
- e. 1 time a month
- f. **Less frequent than 1 times a month (define _____) (= not frequently enough)**

16. Where do you usually eat fish?

- a. At home
 - b. At the restaurant (frequency related to “at home”?)
 - c. At the company’s / school’s canteen (frequency related to “at home”?)
- Decide (if not frequently enough at home – buying and preparing fish ?)**

17. Do you (or any member of your household) go fishing?

- no
- Yes (ask, if.leisure activity)**
- Yes (if profession)**

Rules presentation:

We are conducting interviews in (country) with consumers, to better understand their behavior and perception regarding food, meals and some specific food category such as fish.

The average duration of the interview is 2 hours. The interview will be voice reordered and some pictures will be taken (including a picture of you). All the responses will remain anonymous, as they will be analyzed and grouped together. Your photo will only be used during internal data analysis and will not be distributed. There is no risk for appearing on the web or public space.

Prior to our meeting, you have nothing special to do or prepare, do not change anything in your usual behaviors. All you have to do is to arrive at time at the place I will indicate, or make a call if you have

When the interview will be accomplished, you'll receive an Amazon voucher or 40£ /50 € in cash.

Also, you'll have to sign a receipt confirming your participation at the interview.

Are you OK with these rules?

If qualifies and OK to participate, make appointment:

1 st name
Name
Address
Mail
Phone



Date of appointment for interview
Address for interview
Person to contact
Phone number of person to contact
Mail of person to contact

Appendix 2 Interview guide

INTERVIEW GUIDE PrimeFish

Preamble

Today's interview is related to Research project PrimeFish which is funded by the funding scheme H2020 Programme of the European commission. The overall objective of PrimeFish is to enhance the economic sustainability and competitiveness of European fisheries and aquaculture sectors. In order to reach this goal, the project partner of Prime Fish analyzing the European seafood market in general and some specific seafood supply-chains in particular.

The scope of our interview is to better understand consumers' behavior and perception regarding food, meals and some specific food category such as fish.

There is no true or false answer. It is your opinion which is important, so be as honest as possible, don't try to make us happy or not with your answers. All your answers will remain anonymous; they will be compiled in more general results.

Don't hesitate to ask for a break if you need.

1. Context / Background: eating behavior (habits) / food shopping / cooking / food categories (30-35 min)

1.1. Could you describe a **typical-week food consumption** in your family, your family **eating habits**? /(frequent / occasional)

1.1.1.Number of meals per day (+ short description) / Snacking

1.1.2.Place : Home / Restaurant / Fast food / Company canteen-restaurant

1.1.3.Members : Family / Friends

1.1.4.Role of food in your life?

Probe if necessary: Utilitarian value / Health / Pleasure / Other

1.2. How would you describe the **cooking habits** of your household (main meals)?

1.2.1.Who does the cooking/preparation of meals?

1.2.2.Home cooking / Ready to eat / Home delivery

1.2.3.Processed / Semi processed / Ready to eat

1.2.4.Everyday cooking / Sophisticated recipes (precise if different in working days and weekend)

1.2.5.Convenience / Fastness

1.2.6.What characteristic(s) is (are) important for you when preparing meals? Taste / Appearance / Health benefits / Presentation (explanation: if emphasis is on preparing meals with good taste versus health benefits?)

We are now going to focus specifically on some product categories:

- Meat

- Fish

- And any other products that you consider as a substitute to fish and / or meat. (explanation: What the subject will consume as a main meal (eggs, cheese, vegetables ...) if there is no possibility to eat meat or fish; products that they consider fulfilling like meat or fish).

Name them:

1.3. How would you describe the food **purchasing habits** of your household? (focus on key products : Meat / Fish-Seafood / Main substitute)

1.3.1.Frequency

1.3.2.Place

Probe if necessary: Hyper-supermarket / Minimarket / Outside Market / Freeze center / Organic food shop / Deli / Online

On site / Drive

⇒ Adjustments for probe depending on country

1.3.3.Key-products for meal, are (open question, help if necessary, regarding to the following sub items)

- Fresh / Ready to eat, processed / Refrigerated products / Frozen / Caned

- Nutritional information / Origins / Health or environmental concerns / Preservation / Storage form. Why/Why not?

- Role (importance) of: Price / Promotion / Advertising / Brand / Certification Why/? Why not?

- Role (importance) of: Taste / Appearance / Odor / Organoleptic properties/ Why/? Why not?

- Role (importance) of: Communication (with vender) / Information (from television or internet) Why/? Why not?

1.4. Still focusing on these products categories: Meat, Fish-seafood, substitutes
Please ask for each of them.....

- 1.4.1. Frequency of consumption in your family
- 1.4.2. Overall image / impression you have of the category (what do you think of Meat, what image do you have of this product category? How would you compare to other product categories)
- 1.4.3. What you heard (in positive or negative) in the media or among your friends and family
- 1.4.4. Comparison between categories: grouping food categories that present similarities in your mind and explaining why (describing differences and similarities between the groups).

2. Focus on fish / seafood / fishery products – Global perception – Categorization (40 min)

2.1. Consumption

- 2.1.1. Do you eat fish / seafood / fishery products? What type / species of fish/ seafood / fishery products do you consume/use (which most often)?
- 2.1.2. What are the most frequent occasions of consumption?
- 2.1.3. In your household, who consumes fish / seafood / fishery products?
- 2.1.4. Who likes to consume fish / seafood / fishery products? Who doesn't like to consume fish / seafood / fishery products? Why?
- 2.1.5. Does the fish / seafood / fishery products consumption habits of your household members impact your consumption? And if so, how?
- 2.1.6. How would you describe (consider) yourself in terms of fish / seafood / fishery products consumption? And the members of your household?
Probe if necessary: heavy / average / light consumer
- 2.1.7. What are the advantages or positive reasons that encourage you to consume fish / seafood / fishery products?
Probe if necessary: Taste / Health properties / Convenience / Routine / Sustainability / Price, etc.
- 2.1.8. What are the disadvantage or negative reasons that discourage you to consume more fish / seafood / fishery products?
Probe if necessary: Taste / Odor / Bones / Lack of knowledge (for buying or cooking) / Price
- 2.1.9. Have you seen or heard some positive or negative press / news that have encouraged or discouraged you to eat fish or seafood or fishery products? If yes: where? what? when? How this information impacted your consumption?
Probe if necessary : fishing methods / production methods / aquaculture / fish contaminants / importance of the origin

2.2. Purchase

- 2.2.1. Among the proposed types of shops, select 3 that you prefer when buying fish / seafood / fishery products? Why these ones?
Hyper-supermarket
Drive
Minimarket
Market / Outside market
Fish market / Fishmonger
Freeze center
Organic food shop
Deli
Online
⇒ Adjustment of the list depending on country
- 2.2.2. Among the proposed types of shops, select 3 where you (almost) never buy fish / seafood / fishery products? Why these ones?
Hyper-supermarket

- Drive
 - Minimarket
 - Market / Outside market
 - Fish market / Fishmonger
 - Freeze center
 - Organic food shop
 - Deli
 - Online
 - ⇒ Adjustment of the list depending on country
- 2.2.3. In what store shelf do you buy fish / seafood / fishery products?
Probe: self-service / vender
- 2.2.4. Among the proposed types of presentation, select 3 that you prefer when buying fish / seafood / fishery products? Explain why?
- Fresh (whole, stakes, filets)
 - Cello wrapped
 - Frozen
 - Caned
 - Salted / Dried / Smocked
 - Breaded / Sticks
 - Soup
 - Sushi
 - Surimi
 - Ready to eat meal / Processed fish
 - Ready to heat meal
 - ⇒ Adjustment of the list depending on country
- 2.2.5. Among the proposed types of presentation, select 3 that you don't prefer (never buy) when buying fish / seafood / fishery products? Explain why?
- Fresh (whole, stakes, filets)
 - Cello wrapped
 - Frozen
 - Caned
 - Salted / Dried / Smocked
 - Breaded / Sticks
 - Soup
 - Sushi
 - Surimi
 - Ready to eat meal / Processed fish
 - Ready to heat meal
 - ⇒ Adjustment of the list depending on country
- 2.2.6. When you buy fish / seafood / fishery products, is the purchase decision made before you arrive to the store? How your purchase decision is impacted by the surroundings / choice set?
- 2.2.7. Among the proposed criteria, select 3 that are important for you when buying fish / seafood / fishery products? And explain why
- Appearance
 - Freshness (day of catch / use before....)
 - Additives
 - Reputation
 - Price / Promotion
 - Offer in shelf / Consideration set
 - Fish forms / Products
 - Wild / Aquaculture product
 - Traceability / Origins (local / national / imported)
 - Certification or Label (eco / friend of the sea / responsible fisheries)

Seller / Fishmonger advices
 Brand
 Other

2.2.8. Among the proposed criteria, select 3 that are not important for you when buying fish / seafood / fishery products? And explain why

Appearance
 Freshness (day of catch / use before....)
 Additives
 Reputation
 Price / Promotion
 Offer in shelf / Consideration set
 Fish forms / Products
 Wild / Aquaculture product
 Traceability / Origins (local / national / imported)
 Certification or Label (eco / friend of the sea / responsible fisheries)
 Seller / Fishmonger advices
 Brand
 Other.....

2.2.9. Name 3 characteristics that are unacceptable for you when buying fish.

Appearance / Eyes / Skin / Odour
 Freshness (day of catch / use before....)
 Additives
 Reputation
 Price / Promotion
 Offer in shelf / Consideration set
 Fish forms / Products
 Wild / Aquaculture product
 Traceability / Origins (local / national / imported)
 Certification or Label (eco / friend of the sea / responsible fisheries)
 Seller / Fishmonger advices
 Brand
 Other.....

2.2.10. If the fish / seafood / fishery products are out of stock, what product will you choose as a substitution? What criteria will you use for choosing a substitution? (e.g. price, taste, convenience, provenience)

2.3. Storage – Preparation

2.3.1. How do you store fish / seafood / fishery products in your home until meal preparation?

2.3.2. Do you have some specific recipes for fish / seafood / fishery products?

Probe if necessary: depending on occasions, family, guests, time available to prepare, etc...

2.4. Knowledge of fish categories / species

2.4.1. Sorting task: here are some fish species.

Show 20 cards with names of fish species (the same fish species in all countries):

- 6 focus species (salmon, trout, herring, cod, sea bass and sea bream)
- and 14 most consumed / common in the 5 European countries : haddock, alaska pollock/saithe/coalfish/coley, monkfish, tuna, mackerel, sole, sardine, halibut, plaice, hake/burbot/freshwater ling, whiting, seabastes/ocean perth/redfish, catfish, pangasius

2.4.1.1. What are those you don't know at all, those you have never heard of?

- 2.4.1.2. Among the remaining ones (those you know), could you sort them in categories (at least 2)? What criteria have you used for this categorization? Please explain
- 2.4.1.3. Now, still among the remaining ones (those you know) could you divide them in 3 categories depending on the frequency of consumption? (frequently, occasionally, rarely or never). Could you explain why frequently / occasionally / rarely for the specified species?

- ⇒ Take photos of the cards repartition by category.
- ⇒ Interviewer makes sure to place a label indicating which task is being carried out: 2.4.1.2 or 2.4.1.3

3. Focus on fish species (40 min)

Trout
Herring
Salmon
Sea bass
Sea bream
Cod

Here we focus on all the 6 species if they are all known (even if not eaten).

If less than 6 are known - replace (up to 6) by other species (from previous task): the ones that are most eaten and/or favorite.

For each of those 6 fish species:

- 3.1. Spontaneous associations (5 first words that come to mind)
- 3.2. How familiar are you with this fish species?
- 3.3. What do you like about this fish species?
- 3.4. What do you dislike about this fish species?
- 3.5. How frequently do you eat this fish species?
- 3.6. Do you remember when you ate this fish species for the last time?
- 3.7. Under which form do you prefer to buy this fish species? (whole, fillets, fresh frozen, processed, ready meal...)
- 3.8. What type of meal/recipe/way of cooking do you prefer for this fish species?
- 3.9. Where do you like to eat the meal containing this fish species? (home, canteen, restaurant...?)
- 3.10. At what occasion do you like to eat this fish species? (everyday vs weekend???)
- 3.11. In your household, who consumes this fish species? Who doesn't? why?
- 3.12. Where do you buy this fish species?
- 3.13. Is it a planned / unplanned purchase when buying this fish species?
- 3.14. Why do you buy this species? What are your criteria of choice when buying this fish species?
- 3.15. Do you have a specific recipe for this fish species?
- 3.16. During the last 5 years, your consumption of this fish species increase / decrease?
- 3.17. Name a substitution for this fish species? Why did you choose this substitution?
- 3.18. Heard anything positive about this fish species? Anything negative?
 - 3.18.1. What? Where? When?
 - 3.18.2. Did it change your opinion or consumption of the species?



4. Conclusion (5 min)

- 4.1. This interview, has it affected your ideas/ perception of fish / fish species? How?
- 4.2. During the last 5 years, your fish / seafood / fishery products consumption has increased / decreased? Why?
- 4.3. In the future, do you have the feeling that your fish / seafood / fishery products consumption will increase / decrease? Why?

What could make you eat even more fish / seafood / fishery products in th

Appendix 3 Reporting guide/Individual interview overview

Individual reports (Template including example from France)

OVERVIEW

Profile	<p>Elsa Female 48 5 children (19-16-13-8-8) Married 2 adults + 3 children living full time at home + 1 child week-end Teacher – Part time Husband : Researcher – Full time City : Annecy Urban environment Inland Eating fish : 2-3 times a week</p>
Meals	<p>A traditional way of taking meals :</p> <ul style="list-style-type: none"> - Lunch : at home or at work/school - Dinner: at home all family together. Must be lighter than lunch (less energetic spends) <p>Most meals : starter + main course + desert/fruit/dairy A good way to share moments together (conviviality) The wife takes care of most meals</p>
Food	<p>A necessity (need to fill / nourish) Turned into pleasure (taste, moment together) Keeping in mind the health side of it (easy to digest, not too fat in order to maintain good health) Food can be good for body and mind</p>
Cooking	<p>A traditional way of cooking meals : mostly homemade / home cooked by housewife Homemade allows for a better control of quality of meals However, due to the large family and professional occupation of housewife, convenience and fastness of preparation are key</p>
Shopping for food	<p>Once a week at the hypermarket (housewife) Plus complementary shopping sometimes during the weekend at the supermarket of specialty store (butcher, fishmonger, bakery) Seeking convenience (everything at the same time, routine / habits), fastness (no queue up) and selecting what seems to be of good quality (self service) Provenance / origin : when possible, preference given to local or French origin (more difficult when fish is concerned) Certifications : known in the meat/egg categories, not in the fish category</p>
Food categories	<p>Fish can be replaced by eggs, cheese or meat (all are sources of proteins). Fish healthier than meat (good fats), faster to cook than meat (less cooking time, more recipe ideas) But children sometimes reluctant to eating fish (fish bones, taste and smell, bad image due to school meals with fish, not nourishing enough)</p>

Fish consumption	<p>3 times a week (high frequency / France level) Rather for dinner (less nourishing, easier to digest, less a problem if children take more time to eat fish) Fried pan (with or without sauce or spices) or in papillote or Breaded, for children (accompanied with vegetables or starches) or In pastas / pies Rarely in salads (summertime lunch taken at work for the housewife)</p>
Fish Motives	<p>Diet food Healthy, good for body and mind Easy/fast to cook (convenient)</p>
Fish Barriers	<p>Children reluctant (taste, smell, canteen image, not enough nourishing) Bones Not festive food (not to eat with guests) Quality when fish farmed (esp. salmons)</p>
Buying fish	<p>1 time a week At the fresh fish section of the supermarket (you are served by someone) or at the freeze section (self-service) Fresh filets or frozen breaded fish Rarely canned (only during summer with tuna or Sardinia for the housewife) Never : soup, spread pastas, surimi (bad image of surimi : low end fish mixed together and additives) Most of the time, fishes are bought among 4 to 6 fish species (no risk to try something different, efficiency in purchasing products and preparing meals) Labels : unknown Origin : usually France is better, but most fishes sold in France are imported Bad buzz : in the salmon category (fish farmed salmons)</p>
Information sources	<p>No active search about fish Passive information:</p> <ul style="list-style-type: none"> - Very negative TV report about fish farmed salmons - Positive information from health professionals (good for health, must be eaten instead of meat)
Fish categories Fish species	<p>Very good awareness of all species : 15/15 Species not eaten or very unfrequently : 8/15 (whiting, blue ling, sea bass, haddock, sardine, Pollock, mackerel, herring) Classification based on the following criteria:</p> <ul style="list-style-type: none"> - Daily food vs exceptional occasions, i.e. expensive / not expensive - Strong taste or smell vs Normal taste or smell vs no taste - Many bones vs No or not too many bones - Small fishes (pickling) vs Big fishes (family meal) - Canned fishes vs raw fishes - Fishes I know how to cook vs Fishes I don't know how to cook
Perspectives	<p>Tends to eat more and more fish (to the detriment of meat) Would eat even more fish if would be given ideas of recipes, ideas of festive meals based on fishes</p>

<p>Key verbatims</p>	<p><i>In the week days, for lunch, we have fixed hours to respect, sometimes it can be a difficult time, especially with the youngest children.</i></p> <p><i>Whereas during the week end, we go for more convivial meals and dishes: children have more fun, we have a good shared moment all together.</i></p> <p><i>We all love eating, sharing a good moment together, especially for diner.</i></p> <p><i>I try to propose a balanced food and life.</i></p> <p><i>For diner, we have lighter meals (no meat), that are easier to digest.</i></p> <p><i>In the week days, for lunch, we have fixed hours to respect, sometimes it can be a difficult time, especially with the youngest children.</i></p> <p><i>Whereas during the week end, we go for more convivial meals and dishes: children have more fun, we have a good shared moment all together.</i></p> <p><i>We all love eating, sharing a good moment together, especially for diner.</i></p> <p><i>If we go for a festive meal, I will never propose fish because of the children. When they hear fish, they imagine nothing but the one which is served at the canteen, with no taste.</i></p> <p><i>I must cheat to make the white fish more attractive to children, adding tomato sauce, spices, cream but personally I prefer eating it simply cooked in a frying pan or steamed. I've never seen any labels related to fish. I'm aware of labels for meats, but not for fishes.</i></p> <p><i>After having seen reports about the shark extermination for their fins, I don't think I could eat some.</i></p> <p><i>I cannot say I am very aware of fish species. I'm less aware of fishes than of meats. I am not able to identify a fish based on its appearance when it is presented as a whole. Maybe would be easier to identify the different types of filets.</i></p> <p><i>Sardinia : I don't like the taste and the smell. And it is very small, there is nothing to eat. Its better when canned, but I don't like the vision of all these fishes in a can, and I don't buy much can food at home.</i></p> <p><i>I keep buying the same fish species, the ones I'm used to, where I'm sure there are not too many bones.</i></p> <p><i>Cooking fish is faster and easier for me than cooking meat: I'm better at cooking fish than at cooking meat.</i></p> <p><i>I don't like the idea and vision of fishes in a can.</i></p> <p><i>It's not a problem to store fish in the freezer, on the contrary to meat for which the taste fades away.</i></p> <p>Salmon</p> <p><i>The fish that make everyone happy, even the children! We rather eat it during the week end, with fried potatoes. Children love it, and they love the color too!</i></p> <p><i>I will never buy salmon at my usual super market, it's disgusting. The salmon you find in supermarket comes from intensive fish farming, with overcrowded basins, and fishes eating very bad industrial food.</i></p> <p><i>If you want to have good quality, you must pay for it and buy it at the fishmonger, a wild salmon from Scotland.</i></p> <p>Seabass</p> <p><i>I have tried it once, but was very disappointed by its flat taste.</i></p> <p><i>Why not try it again instead of cod for example</i></p>
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Appendix 4 Reporting guide/Macro analysis

MACRO ANALYSIS (Template including example from France)

This report will be delivered by each interviewer in each of the 5 countries. Word document in ENG

It should include 1. General Introduction, 2. Main results including the results of 18 interviews (fish consumers) and the Results of x recruiting interviews (non fish consumers)

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1. Introduction

This section should ONLY include a brief overview of the status in each country, based on a review given by the interviewer, supported by references is preferred, (press, web review, common knowledge) NOT conclusions from the interviews.

Maximum 1 page

PLEASE DO NOT INCLUDE HERE RESULTS FROM INTERVIEWS.

However, within the next section (Chapter 2), comments from the interviewer can be added were relevant and considered helpful for the interpretation of the results. Such examples have been included in blue text (please do the same if you add such comments)

Overview section, current status, development, fish consumption and meal patterns, scandals, campaigns....

2. Interview main results

The first section of Part II is an overview of the recruitment data, both subjects being interviewed and those excluded during the recruitment. The second section (chapter 2-3) should contain the main results of the 18 interviews per country.

- Please use reference to number of subjects when interpreting if some views or behaviors are common or rare, e.g. “most subjects (16/18) consider”
- Please provide some typical verbatims in order to clarify and or emphasize your findings or interpretations of interviews (e.g. “Victus universis caro ferina est lactisque abundans copia qua sustentantur, et herbae multiplices et siquae alites capi per aucupium possint, et plerosque mos vidimus frumenti usum et vini penitus ignorantes” (France – Elsa – 45 y – Frequent – Coast).
- Please add clarifications if you feel that some explanations are needed in **blue text** (some examples are provided in the template)

Profile of interviews and non-consumers

Please provide a summary table containing the following information

Nr interviews	Gender	Location	Age-cluster	Frequency
Nr non-consumers	Gender	Location	Age-cluster	

A short discussion of profile, e.g. :

“Interviews: Gender and age-clusters were equally divided by location, but frequency was generally higher costal (4 high, 4, medium, 1 low) as compared to inland (2 high, 4 medium, 3 low). Generally, fish consumption was higher among the higher two age clusters than the youngest ...

Non-consumer: five were excluded from further interview (due to xx), those were two males (costal area) and one female (inland are).”

Interviews:....

Non-consumers:

Education level, Profession, Employment

interviewed and non-consumers

Interviews:....

Non-consumers:

Household

interviewed and non-consumers

No of household members

No children, age

Interviews:....

Non-consumers:

Income

interviewed and non-consumers

Interviews:....

Non-consumers:

Involvement

interviewed and non-consumers:

Eating fish – shopping for food – cooking/preparing meals

Who does the shopping usually

Who does the cooking/meal preparation usually

Interviews:....

Non-consumers:

Special diet or have allergies

interviewed and non-consumers

Interviews:....

Non-consumers:

consumers definition of frequent fish consumption

interviewed and non-consumers

Interviews:....

Non-consumers:

place of fish consumption

interviewed and non-consumers

Interviews:....

Non-consumers:

fishing

interviewed and non-consumers

Interviews:....

Non-consumers:

Next sections: Interviewed consumers only

2.1. General consumption

2.1.1 Eating and meal preparation habits

(food in general, section 1.1 interview guide)

Typical week food consumption

Comment from interviewer: Eating in France remains pretty structured: 3 meals a day, pretty much at the same time (7-8h, 12-13h, 19-20h + teatime for children 16-17h)

In most cases:

- Meals are taken sitting in kitchen or dining room, using plate, fork and knife (14/18)
- Meals are home made by one family member (12/18)

For those who work (12/18) or go to school (2/18), lunch is taken:

- Canteen / company restaurant most often (8/14)
- Or a meal your bring from home and eat in the office kitchen most often 4/14)
- Or, restaurant / fast-food / food truck / bakery close to the office most often (2/14)

Lunch or dinner

- Starter (not systematically): salad, raw vegetables, soup, cold cuts
- Main course (Meat or fish or eggs + vegetables and/or starches)
 - o Winter: main course is hot
 - o Summer : can be cold. The whole meal can be cold.
- Cheese (not systematically)
- Desert (yoghurt or fruit or cake)
- Bread (not systematically)

Restaurant : pretty rarely

- Either during the week-end, or for special events (birthdays, Christmas, etc), or for business
- Fish is often proposed in restaurants menus ([Comment from interviewer: Some fish restaurant chains are developing in France in commercial centers / malls \(i.e. : La Criée\)](#))

Fast food : from not frequented (older people or rural people) to very often frequented (young people, urban people)

- Increasing (with young and urban people)
- Leaders : MacDo, Quick (many hamburgers, very few fish nuggets/sticks)

Home delivery of meals : pretty unfrequently

- Sushi, Pizzas, Chinese
- Only in urban areas

Snacking : frequent

- With sweet foods (15/18) and savory foods (biscuits, chocolate, candies, crisps, crackers) (12/18)
- (Comment from interviewer: Rather with young people and/or poor families, Keeps growing ?)

Members of family

- Consume alone or together...

Role of food (e.g.):

- Health
- Pleasure ...

Cooking and meal preparation (food in general)

Section 1.2 interview guide

Who prepares meals

Type of meal preparation

- Home cooking including degree of effort
 - o Everyday cooking
 - o Other (obs if different in working days and weekend)
- Ready to eat
- Home delivery
- Convenience

Cooking process

- In the fry pan 8/18 (meat, fish, vegetables)
- In the oven 5/18 (pies, roasts, gratins)
- Boiled .. (vegetables)
- Steamed .. (vegetables, fish)
- Papillotes (fish)
- Barbecue (summer – meats 12/18 and fish 9/18)

Important when preparing meals

- Taste
- Appearance
- Health benefits
- Conflicting attributes e.g taste vs health benefits

Comment from interviewer: Obesity Keeps growing, especially in poor families, But less developed than in the US (15% in France vs 30% in the US)

Cooking tradition remains high in France

- Transmitting recipes from generations to generations
- Many TV shows based on cooking (Topchef, Carnet de Julie, Meilleur pâtissier monde, etc.)
- In the household, women more involved in cooking than men

Home equipment for cooking

- Hotplate
- Cooker hood (not always)
- Oven (not always)
- Microwave oven
- Refrigerator
- Freezer (not always)
- Kitchen : closed or open (tends to be more and more open)

Household meals

- Using raw products (fresh or frozen) : tends to decrease in France
- Using raw semi-finished products (the preparation is already done, you only have to cook the product): tends to increase in France
- Using ready to eat food (the preparation and cooking is done, you just have to warm up the meal): tends to increase in France

Local culinary traditions remain high

- Brittany / Mediterranean region : fish, seafood
- Northern area : mussels
- Mountain areas : lake and river fishes

Typical verbatims

- Victus universis caro ferina est lactisque abundans copia qua sustentantur, et herbae multiplices et siquae alites capi per aucupium possint, et plerosque mos vidimus frumenti usum et vini penitus ignorantes. (France – Elsa – 45 y – Frequent – Coast)
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2.1.2 Shopping and consumption food categories

Food categories: Meat, Fish-seafood, substitutes

Shopping/purchase divided by category

Frequency of consumption divided by category

Main substitutes for meat and fish:

What and why

2.1.2.1 Fish shopping and consumption

Example from France for fish:

Place and frequency

- Hyper – Super market (incl Drive) (15/18): convenient (all food products and household products at the same place) and price (not too expensive)
- Local grocery store (10/18): convenient (close to home)
- Specialty shops (butcher, fishmonger, cheese dairy, etc): quality, choice, advice from vendors
Outside markets: quality, local origin, advice, tradition
- Organic grocery shop or supermarket: is increasing in France. Quality, ethic. Fish rarely found in this channel
- Short circuit – Local producers: is increasing in France, quality, local origin
- Freeze center (Picard, Toupargel, Thiriet): convenience
- Deli (ready to eat, daily special : convenience)

Families

- Most often shopping is done 1 time a week in hyper or super-market
 - o + if necessary, complementing food shopping at the local grocery shop
- Young / Couples / Urbans
 - o More frequent shopping because less space and/or no car, in close grocery shops / convenient stores

You can buy fish:

- Asking a vendor (fish corner in a hyper or super-market, fishmonger, outdoor market or deli shop)
- Or self-service (hyper-supermarket, grocery shop, freeze center)
- Raw / fresh / whole or cut / sliced / frozen
- Or transformed, i.e. adding ingredients (roasted fish, breaded fish, spreadable paste, surimi)
- Or canned

	Raw / Fresh / Whole / Cut / In filet	Cellophane wrapped	Transformed Prepared (ready to cook or ready to eat)	Smoked Dried	Frozen	Canned	Breaded
Hyper-super							
Grocerystore							
Fishmonger							
Outdoor market							
Producer							
Freeze center							
Deli							
Fast food							

Most often

- Fish is eaten at home, during the main meals: either lunch or dinner.
- It is eaten warm, accompanied with vegetable or rice, as a main course.
- The alternative to fish is meat (either fish or meat)

Typical verbatims

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Key attributes for fish

- Product types (fresh, RTE, frozen, etc)
- Information on packaging
 - o Nutritional
 - o Origin
 - o Health
 - o Environment
 - o Storage guidelines
 - o Cooking guidelines
 - o Price
 - o Brand
 - o Certification
 - o Other...

- Importance of sensory attributes
- Importance of communication at store/purchase
- Information sources (TV, internet, other ...)

Typical verbatims

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Image of the food category

Q 1.4

- Frequency of fish consumption in the family
- Image of fish/seafood

Image and impression of each food category (what they think), followed by comparison between categories, - differences and similarities between the groups

Example from France:

- Home cooked fish as a better image than canteen fish. Canteen fish: no taste, bad quality of the raw fish.
- Fish proposed at the restaurant has a pretty good image. It is also the occasion to discover species you are not used to cooking at home.
- Wild fish has a better image than farmed-fish. However, it seems that consumers are concerned by the origin only when it comes to salmon. They are never proposed different origins with other species.
- Labels or certifications are never mentioned/known in the fish category (to the contrary of meat, where the Label Rouge is often mentioned as something reassuring).
- Compared to other food categories
 - Fish vs meat:
 - Very close in the sense that they can be used in the main course
 - Fish healthier (good fats), unlike meat, recommended by doctors (unlike meat)
 - Less nourishing- less filling the body (reason for which children and teens don't like it much)
 - More smelly when cooked (will be avoided in case of guests, unlike meat)
 - Etc...
 - Fish vs substitutes
 - vs eggs:
 - vs Tofu:
 - ...

- What they have heard positive or negative
 - o Media (and what media) Friends, family
 - o Scandals (what, where)
 - o Intensive farming
 - o Salmons contaminated by antibiotics, fed with junk food
 - o Overfishing, fishing in the deep-sea, mesh size of fishing net
 - o industrial farming of fish
 - o overfishing
 - o campaigns / recommendations
 - o Eat local
 - o Eat seasonal products
 - o Eat bio/organic
 - o Eat varied
 - o 5 fruit and vegetables a day (government campaign)
 - o Lower the consumption of animal proteins (less meat and/or fish)
 - o TV shows dedicated to cooking
 - o Nutritional information on packaging: standardizing / norming the information

- Categorization of products within food category
 - o Similarities, explanations
 - o Dissimilarities, explanations

Typical verbatims

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2.1.2.2 Meat shopping and consumption

Change as needed

Place and frequency

- Hyper-supermarkets
- Minimarket
- Outside market
- Freeze centers
- Organic food shop
- Deli
- Online
- Other...

Most often shopping is done ...

- Young
- Couples
- Urbans

You can buy meat:

- Asking a vendor
- Or self-service
- Raw / fresh / whole or cut / sliced / frozen
- Or transformed, i.e. adding ingredients
- Or canned

Most often

- meat is eaten at ...
- It is eaten warm, accompanied with vegetable or rice, as a main course.
- The alternative to meat is...

Typical verbatims

- Victus universis caro ferina est lactisque abundans copia qua sustentantur, et herbae multiplices et siquae alites capi per aucupium possint, et plerosque mos vidimus frumenti usum et vini penitus ignorantes. (France – Elsa – 45 y – Frequent – Coast)
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Key attributes for meat

- Product types (fresh, RTE, frozen, etc)
- Information on packaging
 - o Nutritional
 - o Origin
 - o Health
 - o Environment
 - o Storage guidelines
 - o Cooking guidelines
 - o Price
 - o Brand
 - o Certification
 - o Other...
- Importance of sensory attributes
- Importance of communication at store/purchase
- Information sources (TV, internet, other ...)

Typical verbatims

- Victus universis caro ferina est lactisque abundans copia qua sustentantur, et herbae multiplices et siquae alites capi per aucupium possint, et plerosque mos vidimus frumenti usum et vini penitus ignorantes. (France – Elsa – 45 y – Frequent – Coast)
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Image of the food category

Q 1.4 Image and impression of each food category (what they think), followed by comparison between categories, - differences and similarities between the groups

- Frequency of consumption in the family
- Image of meat
 - Overall
 - Compared to other food categories
- Compared to other food categories
 - meat vs fish:
 - meat vs substitute:
- Information (positive and negative)
 - Media (and what media)
 - Friends, family
 - Scandals
 - Campaigns/recommendations
 - Etc
- Categorization of products within food category
 - o Similarities, dissimilarities, explanations

Typical verbatims

- Victus universis caro ferina est lactisque abundans copia qua sustentantur, et herbae multiplices et siquae alites capi per aucupium possint, et plerosque mos vidimus frumenti usum et vini penitus ignorantes. (France – Elsa – 45 y – Frequent – Coast)
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2.1.2.3 Substitute shopping and consumption

Change as needed

Place and frequency

- Hyper-supermarkets
- Minimarket
- Outside market
- Freeze centers
- Organic food shop
- Deli
- Online
- Other...

Typical verbatims

- Victus universis caro ferina est lactisque abundans copia qua sustentantur, et herbae multiplices et siquae alites capi per aucupium possint, et plerosque mos vidimus frumenti usum et vini penitus ignorantes. (France – Elsa – 45 y – Frequent – Coast)
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Key attributes for substitute

- Product types (fresh, RTE, frozen, etc)
- Information on packaging
 - Nutritional
 - Origin
 - Health
 - Environment
 - Storage guidelines
 - Cooking guidelines
 - Price
 - Brand
 - Certification
 - Other...
- Importance of sensory attributes
- Importance of communication at store/purchase
- Information sources (TV, internet, other ...)

Typical verbatims

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Image of the food category

Q 1.4 Image and impression of each food category (what they think), followed by comparison between categories, - differences and similarities between the groups

- Frequency of consumption in the family
- Image of substitute
 - Overall
 - Compared to other food categories
- Compared to other food categories
 - substitute vs fish:
 - substitute vs meat:
- Information (positive and negative)
 - Media (and what media)
 - Friends, family
 - Scandals
 - Campaigns/recommendations
 - etc
- Categorization of products within food category
 - o Similarities, dissimilarities, explanations

Typical verbatims

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2.2 Fish in general

Try as much as possible to indicate the frequency at which what you write has been heard: use counting (12p /18)

2.2.1 Fish consumption

General, frequency,

Fish consumption / Frequency

- Consumption
 - o High consumption: 3 times/week.
 - o Average consumption: 1 time/week to 1 time every 2 weeks
 - o Low consumption: 1 time/month or less
- Species consumed/prepared and which most often
- Occasions of consumption
- Who of household members consumes fish
- Who likes / dislikes (why)
- Influence of other household members on fish consumption (how)
- Do subjects consider themselves and household members in terms of fish consumption (light, heavy, average consumers)

Typical verbatims

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Motives and barriers for fish consumption

- Motives

Example from France:

- o Positives / reasons for consuming fish
 - It is seen as a healthy food: less risky than meat (no fats or good fats), good for weight control (no fat is properly cooked), good nutrients (omegas).
 - Simple, easy and convenient to prepare and cook

Example from France:

- Barriers
 - o Negatives / reasons for not consuming fish
 - Bones (especially for young children)
 - Smells when cooking it (especially for those having a small kitchen or an open kitchen and or no extractor fan)
 - Home cooked fish has a better image than canteen fish. Canteen fish: no taste, bad quality of the raw fish.
 - Storage and conservation being shorter than meat, it needs either to be bought frequently (more frequently than meat), and/or stored in a freezer.
 - Sometimes, bad image for fish-farmed fishes (TV reports): animal welfare (overcrowded basins), animal fed with bad food (antibiotics), not good quality and taste of the fish meat. More true for salmon.

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Effect of positive or negative press

What, where, when, degree of effect

- fishing methods
- production methods
- aquaculture
- fish contaminants
- origin
- etc

Typical verbatims

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2.2.2 Buying fish

(Q 2.2)

Place of purchase

- Most and least preferred shops for fish purchase and reasons
 - Hyper-supermarket
 - Drive
 - Minimarket
 - Market / Outside market
 - Fish market / Fishmonger
 - Freeze center
 - Organic food shop
 - Deli
 - Online
 - etc
- Buying place
 - Self-service
 - Vender
 - Etc
- Most and least preferred types of presentation and reasons
 - Fresh (whole, stakes, filets)
 - Cello wrapped
 - Frozen
 - Caned
 - Salted / Dried / Smocked
 - Breaded / Sticks
 - Soup
 - Sushi
 - Surimi
 - Ready to eat meal / Processed fish
 - Ready to heat meal
 - Other

Buying decisions

- Time of decision
 - before or in store
 - Effect of surroundings
- Important and least important buying criteria and why, unacceptable criteria (2.2.7-2.2.9)
 - Appearance
 - Freshness (day of catch / use before....)
 - Additives
 - Reputation
 - Price / Promotion
 - Offer in shelf / Consideration set

- Fish forms / Products
- Wild / Aquaculture product
- Traceability / Origins (local / national / imported)
- Certification or Label (eco / friend of the sea / responsible fisheries)
- Seller / Fishmonger advices
- Brand
- Other
- Substitution and criteria for choosing (2.2.10)
 - Price
 - Taste
 - Convenience
 - Etc...

Typical verbatims

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2.2.3 Storage and preparation of fish

- From store to preparation
- Recipes
 - Occasions
 - Timeframe
 - etc

Example from France:

- The origin is rarely mentioned as being key criteria, except for salmon.
- There is absolutely no awareness of any label associated to fish (unlikely to meat).
- Should the fish be out of stock, it would be replaced by meat or fish would be bought in another channel of distribution.
- Fish is stored in the refrigerator if it is to be eaten in the day following the day of purchase, and in the freezer for further consumption.
- Cooking fish
 - Fried pan +++: easy to implement, good preservation of taste, healthy (no sauce). Sometimes, in order to be better accepted by children, can be accompanied with tomato sauce, creamy sauce or spices. Mainly for white fishes or salmon.
 - Papillote ++: funny, healthy. Mainly for white fishes or salmon.
 - In a pie, in pastas: with salmon

- In a salad : for canned tuna / mackerels / sardines

Typical verbatims

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2.2.4 Knowledge of fish categories and species

Sorting task (2.4) Focus species (the Primefish species) and other selected

How many, which most, which least known.

Who know/do not know species (e.g. related to age of the person: older people tend to know better the different species??) Who know/do not know species (e.g. related to age of the person: older people tend to know better the different species??)

Categorizing can e.g. be made according to:

- Types of meals (daily vs festivities or parties)
 - Price (expensive / inexpensive)
 - Color / type of fish (white fish / or not)
 - Origin (farmed / wild)
 - Presentation (whole / filet / canned / smoked / breaded / ready to eat)
 - Taste and smell (strong/discreet)
 - Presence of bones (many bones / no bones)
 - Easy to find vs exceptional and rare species
 - Provenance (local origin / country origin /imported)
 - Appreciated by adults / children
- Species known
 - Sorting in categories, explanations
 - Sorting on frequency of consumption, explanations
 - o rarely/never, why
 - o sometimes, why
 - o frequently , why

Typical verbatims



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-

2.3 Primefish species

Species by species: Trout Herring Salmon Sea bass Sea bream Cod

Trout (with some examples)

TROUT (Truite)	
Recognized	17/18 recognized the species trout
Associations	Bones was frequently mentioned (14/17), pink (12/17), expensive (8/17), barbeque (8/17). Fish fat and rancid was mentioned by a few (3/17 and 2/17)
Familiarity	Many were familiar with smoked trout (16/17), not very familiar with fresh one
like	Can be fished in the river (no need to live on the coast) (1/17) Eaten on the spot (BBQ) (2/17) Good taste (4/17), light taste (1/17)
dislike	Bones (16/17) (children do not like that (5/16)) Small fish (not big enough to feed a big family) (1/17) moldy taste (4/17)
Frequency of consumption	Never (3/17), less seldom than two times a year (3/17), a few times in a year (6/17), 1-2 times a month (1/17) in summer more frequently (4/17)
Last time of consumption	Commonly last summer was mentioned (5/17) and many consumed smoked trout (6/17), a few ...
Form Recipes	smoked filet/ as a whole ... pure or on a slice of bread ...
Place of consumption, occasions	at home ...
Occasion	seasonally in summer ...
Consumption in household	Only wife ...
Place of purchase/type of purchase	fish monger or private source (if someone freshly smoke) ... Purchase usually unplanned: appetite on, spontaneous, state occasion – for guests
Criteria for choice of purchase	Origin is important (6/17)
Chance in consumption	Constant (12/17), decreased (2/17), increased 3/17
Substitution	Salmon ..., non (has its own taste)
Buzz about species	Positive: what, where, when. Did it change opinion?
Buzz about species	Negative: what, where, when. Did it change opinion?

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HERRING (Hareng)	
Recognized	
Associations	
Familiarity	
like	
dislike	
Frequency of consumption	
Last time of consumption	
Form Recipes	
Place of consumption, occasions	
Occasion	
Consumption in household	
Place of purchase/type of purchase	
Criteria for choice of purchase	
Chance in consumption	
Substitution	
Buzz about species	
Buzz about species	

Typical verbatims

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SALMON (Saumon)	
Recognized	
Associations	
Familiarity	
like	
dislike	
Frequency of consumption	
Last time of consumption	
Form Recipes	
Place of consumption, occasions	
Occasion	
Consumption in household	
Place of purchase/type of purchase	
Criteria for choice of purchase	
Chance in consumption	
Substitution	
Buzz about species	
Buzz about species	

Typical verbatims

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SEA BASS (Bar / Loup)	
Recognized	
Associations	
Familiarity	
like	
dislike	
Frequency of consumption	
Last time of consumption	
Form Recipes	
Place of consumption, occasions	
Occasion	
Consumption in household	
Place of purchase/type of purchase	
Criteria for choice of purchase	
Chance in consumption	
Substitution	
Buzz about species	
Buzz about species	

Typical verbatims

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SEA BREAM (Daurade)	
Recognized	
Associations	
Familiarity	
like	
dislike	
Frequency of consumption	
Last time of consumption	
Form Recipes	
Place of consumption, occasions	
Occasion	
Consumption in household	
Place of purchase/type of purchase	
Criteria for choice of purchase	
Chance in consumption	
Substitution	
Buzz about species	
Buzz about species	

Typical verbatims

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COD (Cabillaud / Morue)	
Recognized	
Associations	
Familiarity	
like	
dislike	
Frequency of consumption	
Last time of consumption	
Form Recipes	
Place of consumption, occasions	
Occasion	
Consumption in household	
Place of purchase/type of purchase	
Criteria for choice of purchase	

Typical verbatims

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2.4 Perspective

Effect of interview

- ideas/ perception of fish / fish species? How?

Change in fish consumption

- During the last 5 years
 - o Increased, Why?
 - o Decreased, Why?
- During next years
 - o Increase, Why
 - o Decrease, Why
 - o What would increase your fish consumption

Typical verbatims

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3. Overall conclusion

Here you should state how the interview results are in comparison of your review of the country. Also list here the main general motives and barriers.

Any un-expected results?



...