



Social acceptance of sustainable aquaculture and fisheries products

WP 3.1
Study of general acceptance

Target audience

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Associated partners	x
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Introduction

The production of food is inextricably linked to environmental degradation (e.g. greenhouse gas emissions, deforestation, water use) and to certain public health issues in developed countries (e.g. obesity, diabetes). In order to promote a more sustainable and healthier diet in line with the Sustainable Development Goals (SDGs) of the United Nations, it is necessary to rethink the way in which food is produced and consumed (SDG 10). Fishery and Aquaculture Products (FAPs) are traditional activities in the Atlantic Area and play a crucial role in ensuring sustainable and nutritious food consumption on the continent. This is particularly pertinent in the context of mitigating the prevalence of diseases such as diabetes and obesity (FAO 2024). FAPs have been described as being more environmentally sustainable than meat production (Crona et al. 2023), and they are known to be rich in essential nutrients (ibid). A diet comprising a greater proportion of FAPs can engender significant health and environmental benefits (Irz et al. 2018).

However, their consumption varies considerably across EU populations (Eurobarometer 2021), and is dependent on a limited number of species, primarily imported. Europe is a net importer of FAPs, with a self-sufficiency rate of 37.5% for the five main species consumed in the EU 27, and only 9% for these same species combined. These five species accounted for 44% of the EU's total apparent consumption of FAPs in 2023 (EUMOFA 2024). In 2023, the European Union (EU) member states traded the most FAPs with three European countries: Norway, the United Kingdom and Iceland (EUMOFA 2024). Furthermore, the food system of FAPs is expected to experience increased variability in the forthcoming years. This is primarily due to overexploitation (FAO 2022), the impact of climate change on resource availability (Stevenson and Lauth 2019), and changes in nutritional content (e.g. Omega3 (Colombo et al. 2020)). Additionally, exogenous shocks to trade are likely to contribute to this variability. The impact of the pandemic (Asche et al. 2022; Nyiawung et al. 2024) and the European fleet's access to resources (Symes and Phillipson 2019) must be considered when assessing the future of the European food system. The "Farm to Fork" strategy aims to ensure a sustainable and healthy diet for European citizens; however, the challenges posed by the pandemic and the European fleet's access to resources necessitate a rethink of the FAPs.

In order to promote a more equitable, resilient, nutritious, community-based and sustainable FAPs food system in the EU, the commercialisation and consumption of underutilised species with a low environmental footprint and relatively high nutritional value can be part of the solution. In this study, the term underutilised is employed to denote species that have not yet attained a significant market share, or indeed, in some cases, have not yet been incorporated into the human diet. The source

of under-utilised species can be from fisheries (by-catch, low-value species) or from aquaculture (untargeted species in integrated multitrophic aquaculture, IMTA). In a similar manner, the valorisation of all by-products can be regarded as a strategy for enhancing the valorisation of FAPs. The increased consumption of underutilised species and by-products in the fisheries and aquaculture sector represents a valuable asset, which can play a key role in the development of new food products of high added-value.

From an ecological standpoint, the diversification of consumption has been shown to alleviate pressure on overexploited stocks by shifting demand away from a select number of high-demand species. This approach is conducive to the conservation of marine biodiversity and the enhancement of ecosystem resilience in the context of climate change and other environmental stressors.

From an economic perspective, the valorisation of under-utilised species, which are often discarded as bycatch or sold at low prices, has the potential to generate new income streams for the value chain. The promotion of these species has been demonstrated to contribute to market diversification and enhance the stability of the seafood supply chain.

For the nutritional aspect, a considerable number of underutilised species or by-products have been found to be rich in protein, omega-3 fatty acids, and essential micronutrients, thus offering healthy and sustainable alternatives to more familiar fish. From a social perspective, increasing the use of these species is consistent with broader sustainability goals, including the reduction of waste, the advancement of circular economy principles, and the enhancement of food system resilience. Collectively, the promotion of the consumption of underutilised species signifies a strategic opportunity to enhance the sustainability and resilience of the fisheries and aquaculture sector.

But under-utilized species and by-product are often unknown from consumer and introducing a new species is equivalent to introducing a new food, and this often involves consumption barriers. Food neophobia, i.e. the unwillingness to try unfamiliar food (Pliner and Hobden 1992; Çınar, Karinen, and Tybur 2021), has been widely investigated in the case of insect-based food in western countries where this consumption isn't traditional (Verbeke 2015; Caparros Megido et al. 2016; Hartmann and Siegrist 2016). However, this is a very poorly covered area of research in the case of new fisheries and aquaculture products (by-products, by-catches, low trophic species and seaweeds) (Lucas, Gouin, and Lesueur 2019). Knowledge, experiences, testing have also a major role to play in the willingness to consume a new food (Caparros Megido et al. 2016; Hartmann and Siegrist 2016; Piha et al. 2018; Van Loo, Caputo, and Lusk 2020). Furthermore, preferences for food can

be driven by the desire to improve the social and economic conditions of a region (Yang, Hobbs, and Natcher 2020), by the desire to limit environmental impact of consumption (Lucas, Gouin, and Lesueur 2019; Lucas, Ropars-Collet, and Cuilleret 2024) or by the desire to have a healthier diet (Lucas, Gouin, and Lesueur 2019).

Therefore, understanding consumer acceptance of by-products and new marine proteins is crucial in order to reinforce recommendations produced in Europe. Our study will focus on by-products from fish and shellfish, undersized fish, and lesser-known species, as well as two new marine proteins: seaweed and holothuria. Seaweed is currently a niche market in Europe (Lucas, Gouin, and Lesueur 2019) and is largely associated with Asian food products. Consequently, despite seaweed having been present in the European market for years, its market share remains small and needs to be increased to compete with other marine proteins. The European market for holothuria is almost non-existent as it is not traditionally consumed in Europe. The main market for holothuria is China, and the only distribution channel for this species in Europe is through Asian food shops.

To examine the social acceptance of by-products and new marine proteins, we conducted qualitative and quantitative surveys in four European countries: France, Ireland, Spain and Portugal. The report is structured as follows: the methodology and data are presented in section 2, the results are presented in section 3, and the conclusions are presented in section 4.

Methods

2.1 Database construction and presentation

The data used to highlight the social acceptance of 'under-utilised' FAPs were collected through surveys conducted between June and October 2024 in Ireland, France, Spain and Portugal as part of the AQUAFISH0.0 project. The main purpose of the survey was to investigate European acceptance of by-products from fisheries and aquaculture (e.g. bones, skins and unknown species), as well as consumer perceptions and willingness to try edible seaweed and holothuria products.

2.1.1. Qualitative interviews

Prior to constructing a large online survey to determine the social acceptance of 'under-utilised' FAPs, semi-directive interviews were conducted with individuals in Ireland, France, Spain and Portugal in June 2024 (Sauvayre 2013). A total of eight 45-minute semi-structured interviews were conducted in English and French with English- or French-speaking audiences in each country. The interviews covered topics related to perceptions of the fisheries and aquaculture sector in Western Europe. The interviewees were not involved in the fisheries and aquaculture sector. Almost all of the interviews were conducted by videoconference. This introduces a potential bias into the results, as the interviewees were often highly educated, had a good command of English, and were sufficiently motivated to volunteer for the study. They also had the necessary technical skills and equipment to participate in the interviews, including a device with a webcam, microphone, screen, and stable internet connection.

These interviews covered several topics, including knowledge and perception of the fisheries sector, relationship with the environment, and purchasing and consumption practices related to fish and aquaculture products. There was also a focus on seaweed and holothurian products, based on images and evaluation of their visual appeal. The core panel of respondents was selected to provide a diversity of viewpoints from different genders, ages, socio-economic backgrounds, and geographical locations. These diverse profiles enabled us to identify new issues, make specific observations and help construct the survey.

2.1.2. Quantitative survey

Based on previous qualitative research, a quantitative survey was designed and implemented online in October 2024. A total of 4,000 observations were collected from Ireland, France, Spain and Portugal. The survey included around 60 questions and was divided into seven sections (see the English version in Annexe A.1).

Firstly, we examined consumption habits, such as the frequency and location of purchases and consumption, as well as perceptions of FAPs. Then, we drew a parallel with meat products to contextualise the collected data. Secondly, we examined environmental, health and economic preferences. We then asked a set of questions about the nutritional value of FAPs and whether respondents perceived unfamiliar FAPs as posing a health risk. The final questions in this section were about the importance of various market factors when purchasing FAPs, such as local sourcing, fair prices for fishermen, and production methods.

The third part is about acceptance of by-product consumption. We measure willingness to try by-products made from FAPs, such as skin or bones, as well as products made from lesser-known or undersized species. To test acceptance, we ask if they would be willing to eat the following products: crisps made from grilled, flavoured fish skins (Crips); fish sauce made from powdered fish bones (Fish Sauce); white or black pudding made from fish tripe (Pudding); a spread made from leftover fish flesh (Spreadable); and a sauce made from a shellfish carcass (Lobster Bisque) (Shellfish Sauce). The possible answers were: By no means; unlikely; just to try; definitely, I think I'd like that. We also test the acceptability of unknown species and undersized fish.

The fourth part focuses on the social acceptance of holothuria and seaweed, and how information can influence the willingness to try novel marine proteins. This aspect varies from person to person, as half of the respondents were asked about sea cucumbers and the other half about seaweed (the groups were allocated at random). After assessing acceptability in the absence of information, either a positive environmental or health benefit was randomly provided before acceptability was assessed again (see Figure 1).

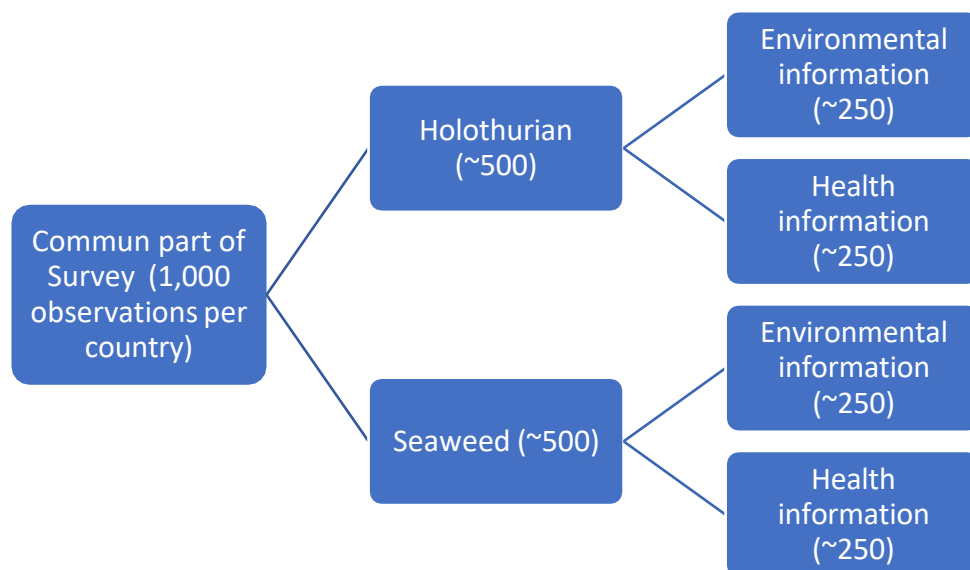


Figure 1 - Survey strategy and number of observations per country (2025, own elaboration)

The fifth and sixth parts focus on evaluating subjective and objective knowledge about fisheries and the aquaculture sector, as well as objective knowledge about circular economics. The final section covers sociodemographic.

2.2 Methodology

To compare differences in our sample, we used a two-step process. First, we performed a variance ratio test to check for equality of variance between the two groups. If the variances were equal (at a significance level of 5% or less), we used a Student's t-test to compare the means and determine whether there was a statistically significant difference between the two groups. Only significance at the 1% level was considered. When the variances between the two groups were unequal, we used Welch's t-test, which is specifically designed for situations where the two samples may have different variances, to determine whether there was a statistically significant difference between the means of the two groups. Only significance at the 1% level was considered.

To estimate the difference in willingness to accept environmental information before and after receiving it, and to test whether this increased after the intervention, we used a paired t-test to determine whether the difference in average scores (after minus before) was significantly different from zero.

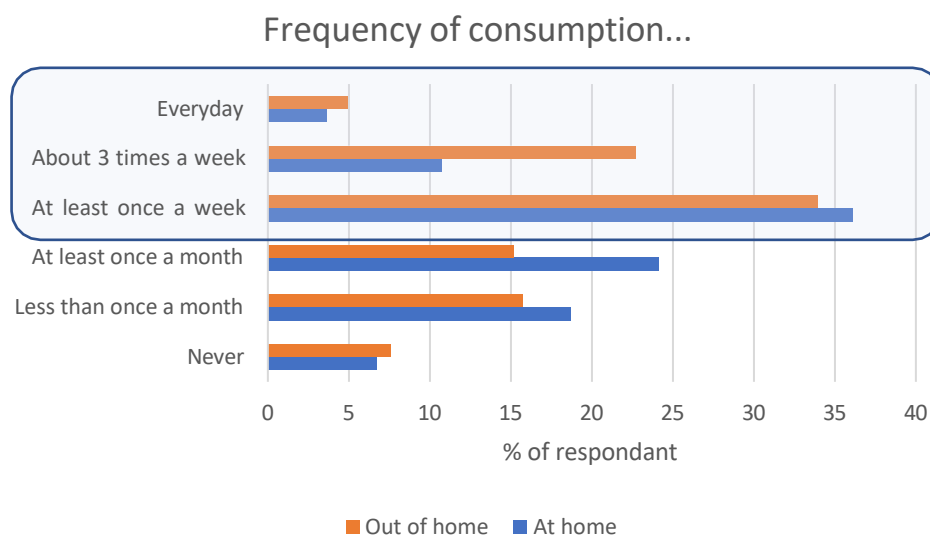


Figure 2-Frequency of consumption at home and out of home. Nb. of Observations: 4000

We examine the differences between countries, as well as between gender, age group, level of consumption, ecological behaviour and subjective and objective knowledge (see Annexe A.2 for descriptive statics of the used variables). If the group variable was sometimes already binary (country, age), we need to construct some new variables to look at the differences between groups

in terms of age, level of consumption or knowledge. First, to examine the impact of the frequency with which FAPs are consumed at home and outside the home, two new variables were created: 'frequency of consumption at home' and 'frequency of consumption out of home'. These variables encompass individuals who consume FAPs at least once a week (at home or out of home, respectively), which corresponds to the part highlighted in Figure 2.

The age variable is categorised into four distinct groups: age1 (18-34 years), age2 (35-49 years), age3 (50-64 years) and age4 (65+ years) (see Figure 3).

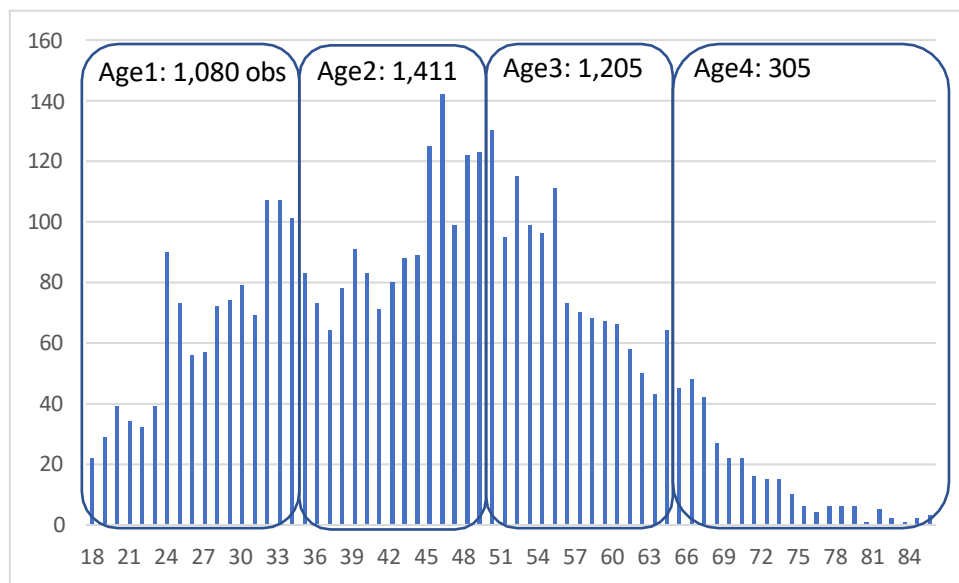


Figure 3- Distribution of age. Nb of Observations: 4000. Own elaboration (2025)

The ecological behaviour was constructed using a set of questions to create the variables. Five questions about pro-environmental behaviour (refer to question 18, annex 1). The respondents were invited to position themselves on a four-level scale ranging from "Never" to "Systematically". The results obtained were summarised, resulting in a score ranging from 5 to 20, with higher scores indicative of a greater ecological behaviour. The variable entitled "Ecological Behaviour" encompasses all respondents who have attained a score of 13 or above (see the highlighted zone in Figure 4).

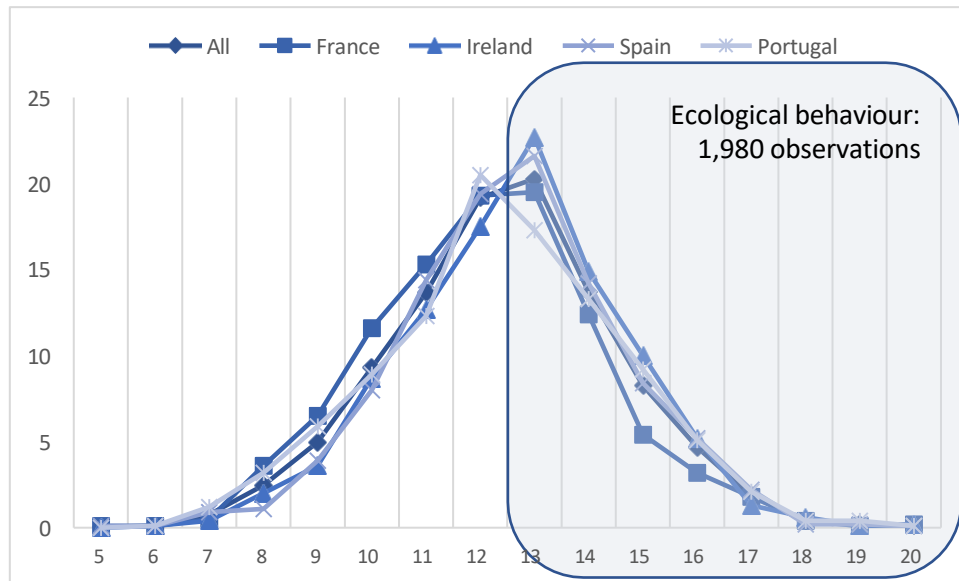


Figure 4- Distribution of Ecological Biahvior. Number of observations: 4,000 (France:1,000; Ireland:1,000; Spain: 1,000; Portugal: 1,000) Own Elaboration (2025)

The subjective and objective knowledge was constructed using a set of questions to create the variables. In the context of subjective knowledge, inquiries concerning the individual's self-perception regarding their comprehension of FAPs (refer to question 44, Annex A.1) are to be addressed. The respondents were invited to position themselves on a four-level scale ranging from "Exactly like me" to "It's the opposite of me". The results obtained were summarised, resulting in a score ranging from 4 to 16, with higher scores indicative of a greater perception of knowledge regarding FAPs. The variable entitled 'Subjective knowledge' encompasses all respondents who have attained a score of 9 or above (see the highlighted zone Figure 5).

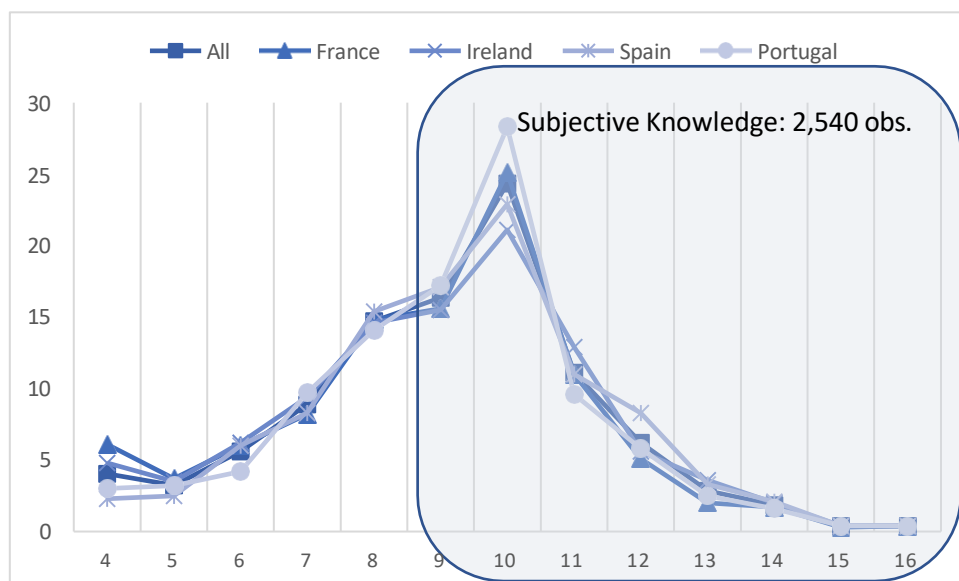


Figure 5-Distribution of subjective knowledge. Number of observations: 4,000 (France:1,000; Ireland:1,000; Spain: 1,000; Portugal: 1,000) Own Elaboration (2025)

In order to ascertain objective knowledge, respondents were presented with seven true or false questions concerning FAPs (see question 45, annexe 1¹). The score was 1 when the correct answer was given, resulting in a maximum score of seven. The variable 'Objective Knowledge' is defined as all respondents who achieve a score of 4 or higher (see the highlighted zone Figure 6).

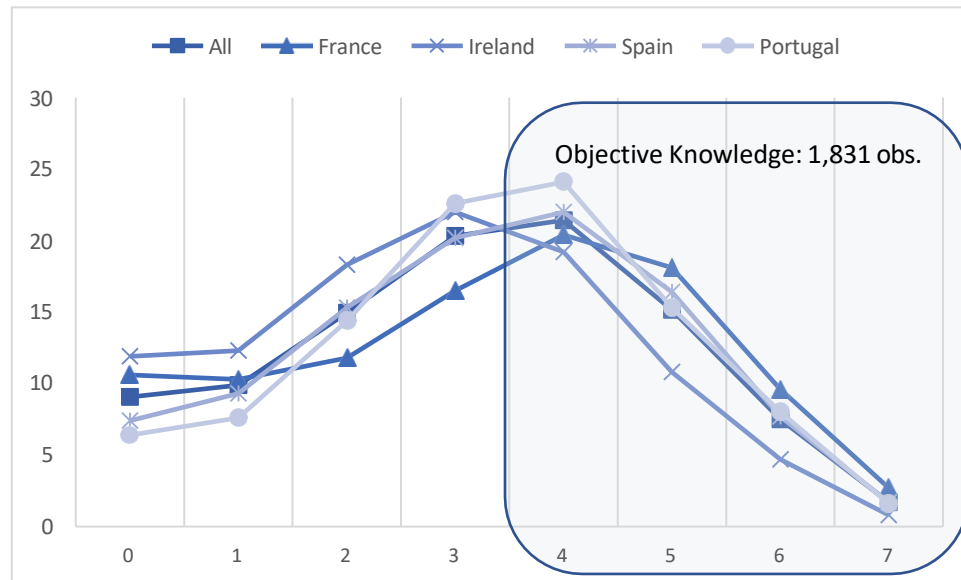


Figure 6-Distribution of objective knowledge. Number of observations: 4,000 (France:1,000; Ireland:1,000; Spain: 1,000; Portugal: 1,000). Own elaboration (2025)

With regard to the results section, all treatments were conducted on 4,000 observations, with the exception of the gender analysis, for which only 3,994 observations were utilised due to missing values.

Results

3.1 Qualitative interviews

The results of the interviews indicate a superficial comprehension of the aquaculture industry, frequently accompanied by a negative perception of fish farming. It is erroneous to consider seaweeds and holothuria as analogous entities in terms of their culinary application. The former is widely recognised as a foodstuff, whereas the latter is not. This is primarily due to the lack of awareness regarding the consumption of holothuria. The respondents exhibited an intense aversion to images of food preparations derived from holothurians. However, this aversion was superseded by a sense of curiosity as soon as a description of the product was provided.

¹ The survey contained eight questions for objective knowledge, but the third question had not been asked the same way in all countries, so it was removed from the analysis.

A significant proportion of the subjects interviewed expressed a desire to adopt more sustainable eating habits in response to ecological challenges. However, these subjects also asserted that they would be willing to consume a more sustainable seafood product only if they were familiar with it, i.e. if they had knowledge of its name, texture, taste and nutritional value.

Finally, an aversion to FAPs on the part of people living far from the coast was systematically pronounced. This aversion was expressed as a regular lack of freshness, discernible from the smell and the sight of the sometimes-glassy eyes of "fresh" fish.

3.2 Survey results

3.2.1. By product acceptance

Questions about the acceptability of by-products were asked of respondents from all countries. The data demonstrate that the highest level of acceptability is for the sauce made from shellfish carcasses (shellfish sauce), while the lower level is for white or black pudding made from fish tripe (pudding) (see Figure 7). For Shellfish Sauce, 63.6% of respondents have a positive willingness to try, while it is only 38.72% for pudding.

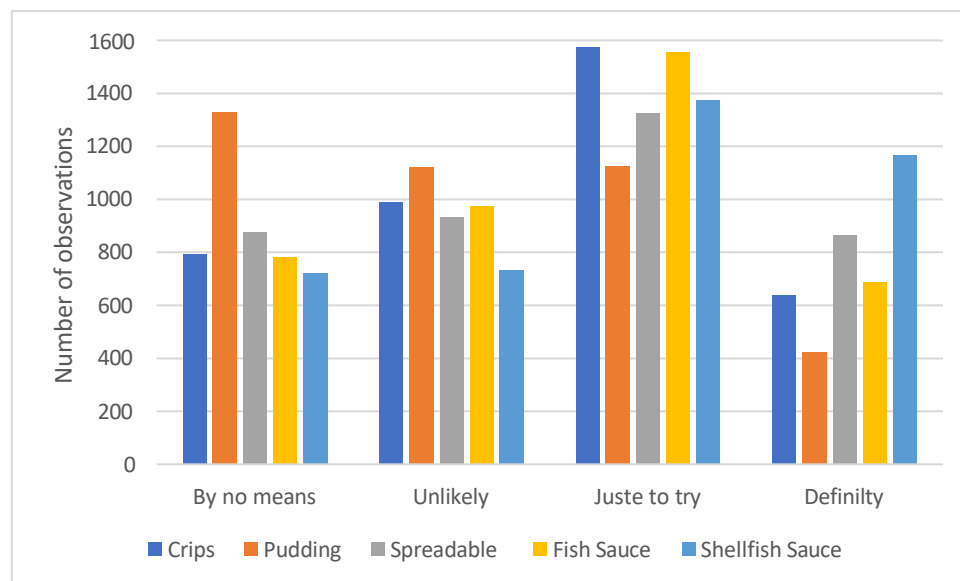


Figure 7 - Social acceptance of by-products. Number of observations: 4,000. Own elaboration.

At the country level, it was found that acceptance may vary slightly depending on the by-products. An analysis of the mean responses to each product, with 1 representing 'not at all' and 4 representing 'definitely', revealed a higher level of acceptance in Spain and a lower level of acceptance in Ireland (see Figure 8). To be more precise, the level of acceptance of crisps is significantly higher in Spain than in France and Ireland. With regard to the consumption of pudding, the level of acceptance is significantly higher in Spain than in other countries. For spreadable

products, the level of acceptance in Spain is significantly higher than in Ireland, but significantly lower than in France and Portugal, which are not significantly different from each other. In comparison, Ireland has a significantly lower level of acceptance for shellfish sauce.

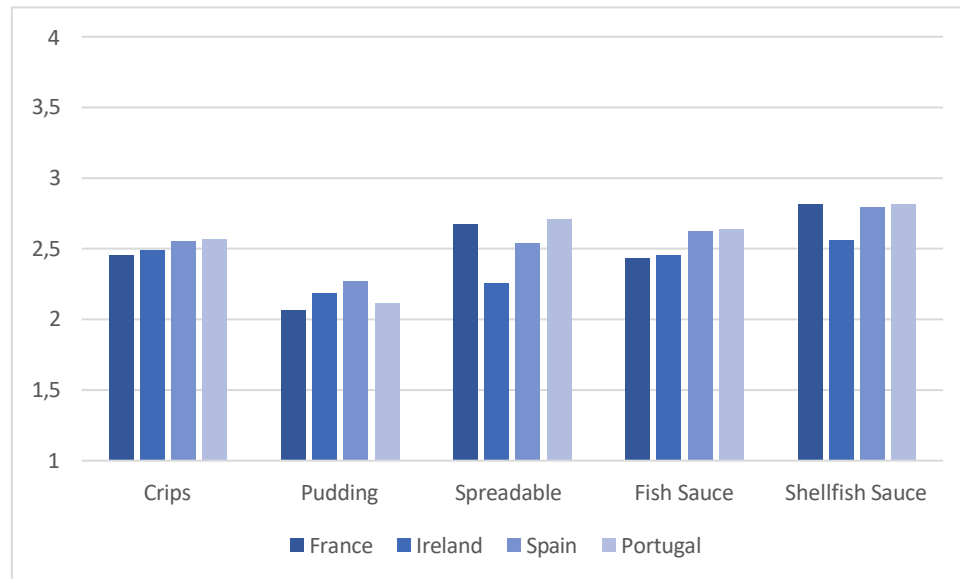


Figure 8- Mean of acceptance of by-products, by country. Number of observations: 4,000 (France:1,000; Ireland:1,000; Spain: 1,000; Portugal: 1,000). Own elaboration.

The findings of the study demonstrated that individuals who consumed FAPs regularly (at least once a week), both in the domestic and non-domestic environment, exhibited a higher level of acceptability towards all products. With regard to gender, the level of acceptance for all by-products is notably lower among women. The level of acceptance of crisps derived from fish skins is found to be highest among individuals aged between 35 and 65 years and lowest among those aged 65 years and over. With regard to the consumption of pudding, a lower level of acceptance is observed among individuals aged 65 years and over. In the case of spreadable products, no differences were found between generations. As regards fish sauce, the oldest and youngest groups demonstrate a lower level of acceptance, whilst individuals between the ages of 35 and 64 years old exhibit a higher level of acceptance. With regard to shellfish sauce, the youngest participants demonstrated a lower level of acceptance, while those between 50 and 64 years of age exhibited the highest level of acceptance. People who already have pro-environmental behaviour are more willing to try by-products. Individuals who possess a high level of objective knowledge regarding the FAP sector, or who hold a strong perception of their own knowledge (i.e. high subjective knowledge), display a significantly higher level of acceptance of all by-products.

3.2.2. Undersized and unknown species

Furthermore, questions have been raised concerning the acceptance of unknown species, as well as well-known species that are undersized. Overall the level of acceptance is similar for both proposition: 2,461 positives answers (just to try or Definitely) for unknown species versus 2,591 for undersized species (see Figure 9)

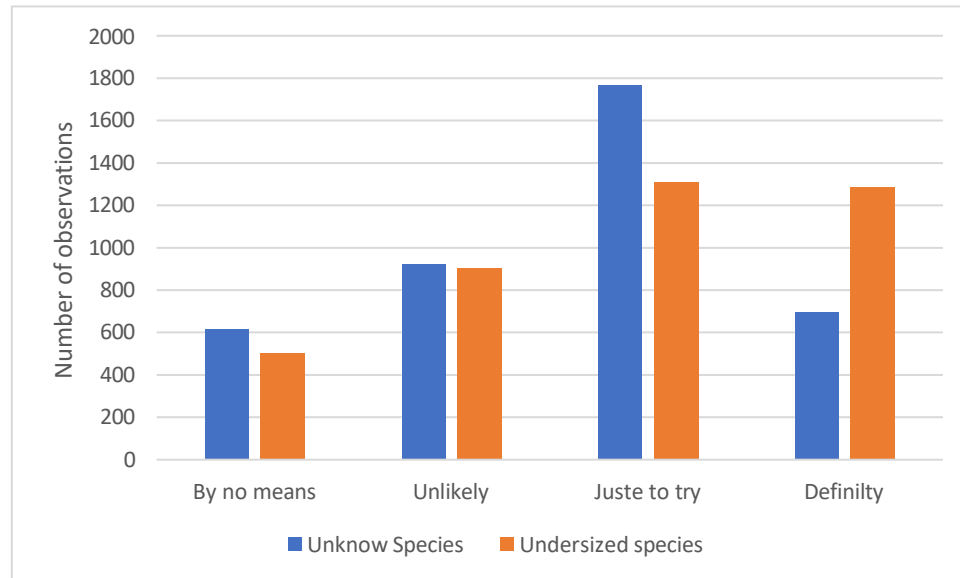


Figure 9 - Social acceptance of unknown or undersized species. Number of observations: 4,000. Own elaboration.

At the country level, France and Spain have a significantly higher level of acceptance for the sale of unknown species in regular shops, while Ireland's level of acceptance is significantly lower than that of other countries (see Figure 10). For undersized species, only Spain as a significant lower level of acceptance. Nevertheless, the mean level of acceptance of undersized species remains higher than for unknown or by-product for Ireland, France and Portugal. For Spain, however, it is the highest mean for shellfish sauce by-products.

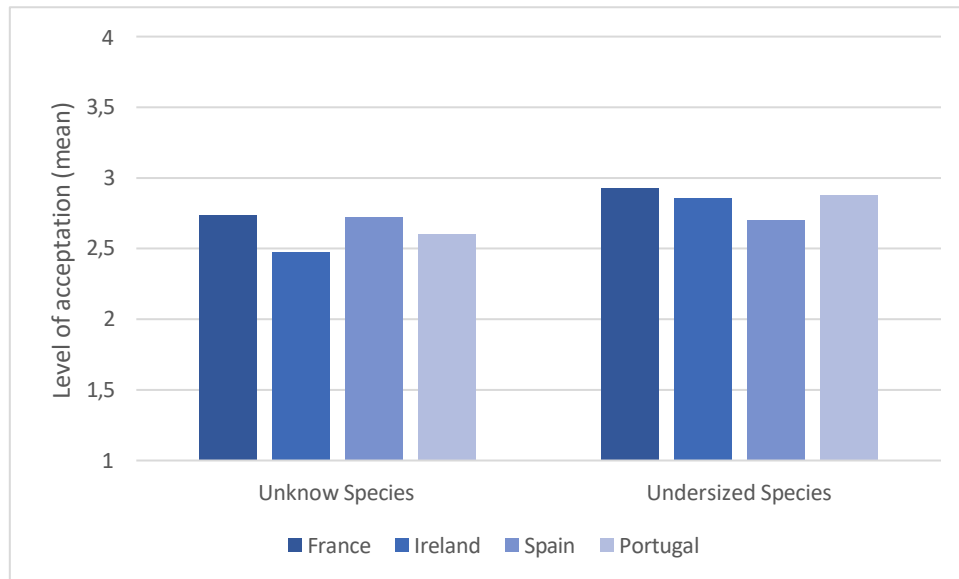


Figure 10-Mean of acceptance of by-unknown species and undersized species. Number of observations: 4,000 (France:1,000; Ireland:1,000; Spain: 1,000; Portugal: 1,000). Own elaboration.

For unknown species, we found that regular consumers of FAPs at home and away from home were more likely to accept them. However, for undersized species, we found that only those who consume regularly at home have a higher level of acceptance; there was no significant difference in acceptance based on frequency of consumption outside the home. In terms of gender, we find that women have a significantly lower level of acceptance for unknown species, but no significant difference for undersized species. Undersized species are accepted at a higher level by all genders. We found no difference in acceptance of unknown species between generations. However, we found that the youngest generation tended to have a significantly lower acceptance level for undersized species. People who already engage in pro-environmental behaviour are more willing to try undersized species, but there is no significant difference for unknown species. People with an objective knowledge score of 4 points or more about the FAPs sector (on a scale from 0 - no good answers to 7 - all good answers) have a significantly higher level of acceptance of unknown species and undersized fish. For subjective knowledge, this result only applies to unknown species.

3.2.3. Social acceptance of holothuria

Overall, the level of acceptance of holothuria is quite low. Only 48.08% of people said they would be willing to try it based on the pictures shown to them. Nevertheless, the background information provided to the consumer when they are asked to consume holothuria can significantly increase their level of acceptance (see Figure 11). Providing any additional information about the production process (e.g. whether the holothuria is sourced from local fisheries or aquaculture, or whether it is really fresh) or the consumption environment (e.g. whether the holothuria is consumed with family or friends) significantly increases the level of acceptance. Finally, we describe the product in terms

of taste and texture. This results in a higher level of acceptance, with 55.86% of people giving a positive response (either 'Just to try' or 'Definitely'). As there are no significant differences in the production information, only one set of data will be kept for analysis at country level (freshness). The same applies to the description of the consumption environment: only situations in which the product is consumed with family members will be kept.

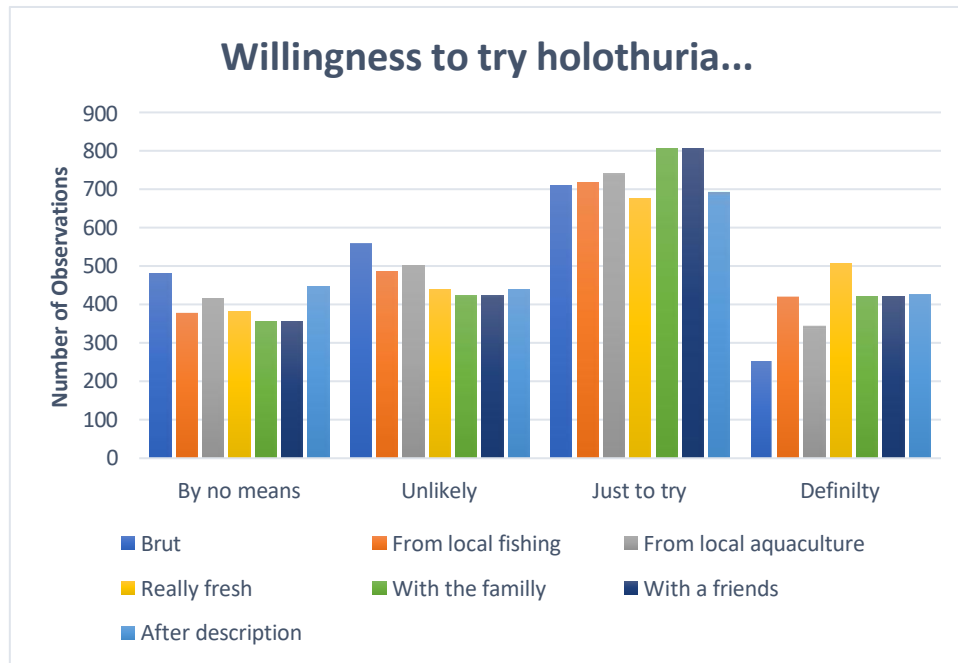


Figure 11 - Social acceptance of holothuria products. Number of observations: 2,005. Own elaboration (2025)

At the country level, there is a significant discrepancy in the acceptance of Holothuria based exclusively on visual identification between different countries. Spain has been found to have the highest level of acceptance, while Ireland has been found to have the lowest. (see Figure 12). This result remains consistent when the freshness of the holothurian is emphasised or when the family is included in the instant of consumption. Following the presentation of the product description in terms of taste and texture, a lower level of acceptance was observed for France and Ireland in comparison to Spain.

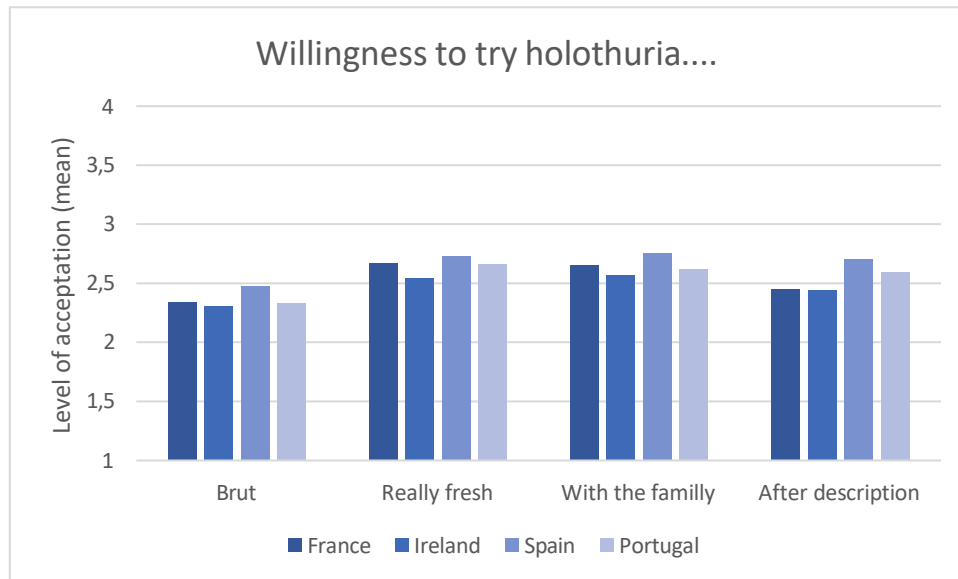


Figure 12 - Mean of acceptance of holothuria. Number of observations: 2,005 (France:499; Ireland:494; Spain: 516; Portugal: 496). Own elaboration (2025)

For holothuria acceptance, we found that regular consumers of FAPs at home and away from home (consuming at least once a week) were more likely to accept them. In all situations, women's level of acceptance is significantly lower than men's. The youngest generation shows a lower increase in acceptance of holothuria when given information about freshness, the family context of consumption, or details about taste and texture than other age groups. Individuals who already have pro-environmental behaviour are more willing to try holothuria in all situations. People with high levels of objective or subjective knowledge about FAPs have a significantly higher level of acceptance of holothuria in all situations. In regards of by product², we find that people with a mean of acceptance higher than 2.5 (on a scale from 0 to 4) have a significant higher level of acceptance of holothuria in all situations.

3.2.4. Social acceptance of Seaweeds

Overall, seaweed is quite well accepted, especially compared to holothuria. 69.52% of people said they would be willing to try seaweed based only on the pictures shown to them. This is most likely attributable to the fact that seaweed is commonly known as edible: 82% of individuals are aware of this, in contrast to the mere 25% who hold this knowledge regarding holothuria. The study revealed no significant differences in the level of acceptance when the product was presented as locally sourced or when the taste and texture of the product were described. However, a significant increase in acceptance was observed when the consumption context (e.g., consumption with family or friends) was specified (see Figure 13). The highest level of acceptance for seaweed is when the

² The by-product variable is based on the mean of acceptance of the five by product proposed to the respondents.

product is consumed in a family or social context, with 75% of people agreeing to at least try it in these circumstances.

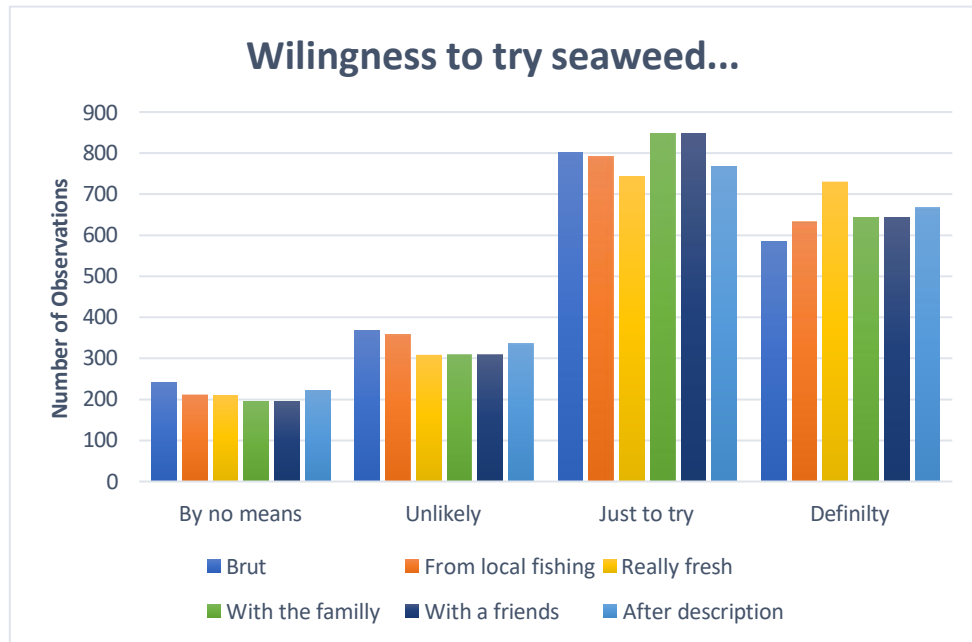


Figure 13 - Social acceptance of seaweed products. Number of observations: 1,995. Own elaboration (2025)

At the country level, France is the only one with a significantly lower value than Portugal and Spain. There are two extremes: France has the lowest level of acceptance, while Portugal and Spain have the highest (they are really close to each other) (see Figure 14). When it comes to the impact of family context, France's level of acceptance remains significantly lower than that of all other countries. As the description of seaweed has an important negative impact on Portugal's level of acceptance, the difference in acceptance between France and Portugal is no longer significant, although it remains significant for Spain and Ireland.

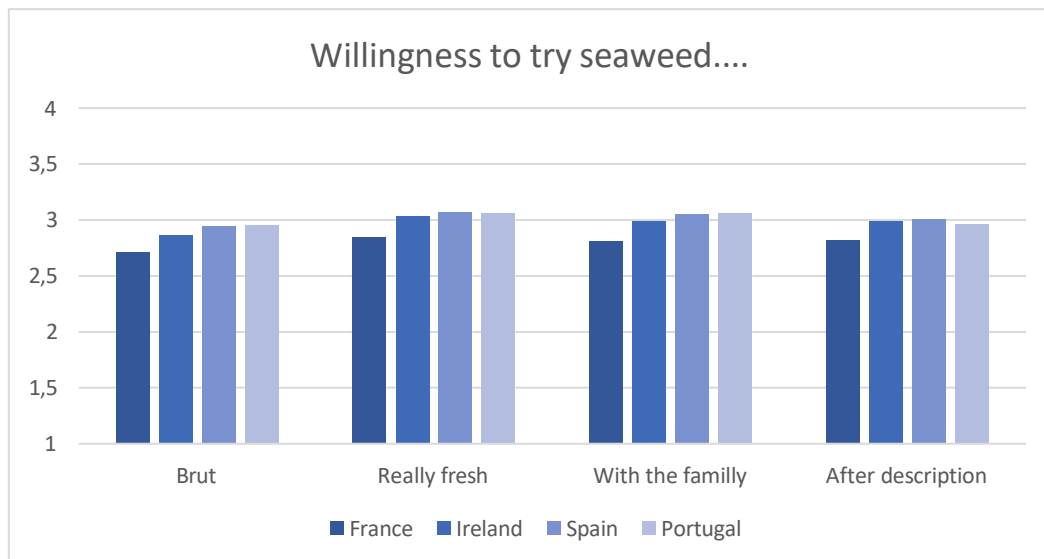


Figure 14 - Mean of acceptance of seaweed. Number of observations: 1,995 (France:501; Ireland:506; Spain: 484; Portugal: 504). Own elaboration (2025)

For seaweed acceptance, we found that regular out-of-home consumers of FAPs tend to find it more acceptable in all situations. For at-home consumption, the effect is significant only for taste and texture. We did not find any difference in the level of acceptance of seaweed between women and men. The youngest generation showed a smaller increase in acceptance of seaweed when given a description of its taste and texture compared to when only a picture was shown. Only people between 50 and 64 tend to have a higher level of acceptance when talking about the freshness and taste of the product. Individuals who already exhibit pro-environmental behaviour are more willing to accept seaweed in all situations. Those with a high level of objective or subjective knowledge about FAPs have a significantly higher level of acceptance of seaweed. In regards of by product³, we find that people with a mean of acceptance higher than 2.5 (on a scale from 0 to 4) have a significant higher level of acceptance of seaweed.

3.2.5. Impact of information on holothuria and seaweed acceptance

Two types of information were given to consumers to evaluate the impact of such information on their acceptance of holothuria and seaweed. As previously mentioned, the motivation to try new foods can be reinforced by environmental or health-related factors. The results differ between the two species.

Impact of environmental information

In the literature, environmental motivation can encourage new product consumption (ref). In our case, we examined the impact of environmental information on willingness to try holothuria and seaweed. First, we asked if they were prepared to consume this product (holothuria or seaweed).

³ The by-product variable is based on the mean of acceptance of the five by product proposed to the respondents.

Then, we asked if they would be willing to consume it in different environments or qualities. Finally, we provided information about the taste and texture. (see 3.2.3 et 3.2.4).

The impact of description (taste and texture) on Holothuria and seaweed has been found to be positive and significant. It is not possible to modify or retract information regarding taste and texture. Consequently, the impact of environmental information will be evaluated in comparison to the response given to the question that incorporates taste and texture. The information presented is documented in Annex A.2. It is related to the benefits of consuming holothuria or seaweed in order to increase species diversity and reduce overexploitation.

The results did not highlight any significant effects for any species. Therefore, it can be concluded that environmental information does not have an impact on the level of acceptance of holothuria or seaweed. The sole effect identified pertained to environmental information, and it related to individuals who possessed a high level of subjective knowledge. For French, environmental information pertaining to Holothuria exhibited a significant decline in acceptance levels.

Impact of health information

In the literature, health motivation can be a lever to new product consumption (ref). In our case, we look at the impact of a health information to the acceptance to try holothuria and seaweed. In our case, we examined the impact of health information on willingness to try holothuria and seaweed. As with environmental information, we first asked if they were prepared to consume this product (holothurian or seaweed). Then, we asked if they would be willing to consume it in different environments or qualities. Finally, we provided information about taste and texture. (see 3.2.3 et 3.2.4). As we cannot change or retract information about taste and texture, the impact of the health information will be evaluated in comparison to answers to questions including those about taste and texture. The health information is presented in Annex A.1 and relates to the health benefits of consuming holothuria or seaweed.

In terms of health information, we found no significant impact for holothuria, but a positive and significant impact for seaweed. The positive effect of health information is stronger for women and people aged 35-49. In terms of consumption habits, it has a greater impact on people who do not usually consume at home and on people who consume frequently outside the home. Health information has a greater impact in Portugal.

CONCLUSION :

The AQUAFISH WP3-1 study assessed the social acceptance of underutilised FAPs across four European countries: France, Ireland, Spain, and Portugal. It focused on consumer attitudes toward by-products (such as fish skin crisps and shellfish sauces), lesser-known or undersized species, and novel marine proteins like holothuria and seaweed.

Regarding by-products, the survey found varying levels of acceptance depending on the product type. The most accepted product was a shellfish-based sauce, with 63.6% of respondents expressing a positive willingness to try it. Conversely, only 38.7% were open to trying pudding made from fish tripe. Spanish consumers were consistently more open to these by-products, while Irish consumers showed the lowest levels of acceptance. Gender, age, and consumption habits also played a significant role: men, individuals aged 35 to 64, frequent consumers of FAPs (at home and out of home), and those with high environmental awareness or knowledge of the FAP sector were more likely to try these products. Women and older individuals (65+) were less inclined to accept them.

Acceptance of unknown and undersized fish species was moderately positive and similar for both categories. About 61.5% were willing to try unknown species and 64.8% were open to undersized ones. Again, Spain and France showed higher acceptance, while Ireland lagged. Regular consumers—especially those eating FAPs at home—were more accepting, as were people with greater knowledge or pro-environmental behavior. However, women were less accepting of unknown species, and younger generations were less accepting of undersized fish.

Holothuria had the lowest initial acceptance, with less than half of the respondents willing to try it based on visuals alone. Acceptance increased when additional information was provided regarding freshness, local origin, or the social setting of consumption (e.g., eating with family). Describing the product's taste and texture raised acceptance to 55.9%. Spanish respondents showed the highest acceptance throughout, while Irish respondents showed the lowest. Women, young people, and those unfamiliar with FAPs remained less receptive. However, individuals with higher levels of ecological awareness or knowledge were more willing to try holothuria.

In contrast, seaweed was much better received: 69.5% of respondents said they would be willing to try it, likely due to greater public familiarity. Acceptance rose to 75% when consumption was framed in a family or social context. Portugal and Spain showed the highest levels of acceptance, while France showed significantly lower levels. Interestingly, no gender differences were found for

seaweed, though the youngest generation responded less positively to detailed descriptions of taste and texture. Acceptance was again stronger among those with pro-environmental attitudes and high knowledge of FAPs.

The study also tested whether providing environmental or health information could increase acceptance of holothuria and seaweed. Environmental messaging—framed around biodiversity and reducing overexploitation—did not significantly influence acceptance for either product. In France, it even slightly decreased willingness to try holothuria. Health information had no measurable effect on holothuria, but did have a positive and significant impact on seaweed acceptance. This effect was particularly strong among women, individuals aged 35-49, those who eat outside the home frequently, and Portuguese respondents.

For holothuria, it seems that the lever to encourage consumption is more effective when the context of consumption is emphasized and consumers are accompanied in trying this new product. Providing general information about the environmental or health benefits does not work. For seaweed, if context is also important, the health dimension could be used to encourage consumption.

These findings suggest several implications. First, efforts to improve acceptance of underutilised marine products should focus on product familiarisation. This could include tasting events, cooking demonstrations, or promotional campaigns that introduce consumers to new products in a supportive and sensory-rich environment, event that are planned in the framework of Aquafish0.0 project. Second, communication strategies must be carefully tailored. Generic environmental messages may not work; instead, emphasis should be placed on taste, freshness, social context, and health benefits, particularly for seaweed. Messaging should be targeted by country, age group, and gender to increase effectiveness.

Third, there is strong evidence that education and information campaigns on FAPs in general—both subjective (confidence) and objective (factual knowledge)—could play a vital role in building consumer openness to try new marine protein. These campaigns could be delivered via schools, media, or in-store materials. Fourth, early adopters such as eco-conscious individuals and regular fish consumers should be the primary targets of initial market development strategies. Their engagement can create positive word-of-mouth and serve as a foundation for broader diffusion.

Fifth, product rollout strategies should reflect the differential levels of acceptance across markets. Products like shellfish sauce and seaweed should be prioritised due to their higher acceptance. By contrast, products like fish-tripe pudding or holothuria should be introduced more cautiously,

possibly in niche food markets or focusing on out-of-home consumption. Finally, country-specific approaches are essential. Spain and Portugal are clearly more receptive markets and can serve as testbeds or innovation hubs, while more work is needed in Ireland and France to build familiarity, trust, and openness toward these products.

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ANNEXE

A.1. Survey Aquafish 0.0 (EN)

Hello,

In this questionnaire you will be asked to answer several questions on different subjects. Please try to answer all the questions and remember that there are no right or wrong answers. Your choices are anonymous and will remain so. Enjoy the questionnaire and thank you in advance. There are 92 questions in this survey.

To get started

1. How old are you? * Please write your answer here:

2. What is your gender? *

Please choose **only one** of the following:

- Female
- Male
- Do not wish to answer

3. Where do you live? *

Please choose **only one** of the following:

- | | | |
|---------------|-------------|-------------|
| • Dublin | • Donegal | • Laois |
| • Antrim | • Tipperary | • Offaly |
| • Down | • Kerry | • Cavan |
| • Cork | • Wexford | • Sligo |
| • Galway | • Wicklow | • Roscommon |
| • Londonderry | • Mayo | • Fermanagh |
| • Kildare | • Louth | • Monaghan |
| • Limerick | • Clare | • Carlow |
| • Meath | • Waterford | • Longford |
| • Tyrone | • Kilkenny | • Leitrim |
| • Armagh | • Westmeath | |

Theme 1.1 Seafood habits

4. Where do you normally buy your seafood? (for home consumption) *

Please choose **only one** of the following:

- Supermarkets (including click and collect, excluding fish shops)
- In supermarket fish shops
- Independent fishmongers
- Direct sales (fishing/farming)
- On the internet, by delivery (excluding click and collect)
- In general, you catch the seafood you eat
- Within voluntary food aid circuits
- You don't buy seafood

Seafood includes: various freshwater and saltwater fish, shellfish and seaweed. This definition is valid for the entire questionnaire.

5. You're used to eating seafood... *

Please choose the appropriate response for each item:

	Everyday	About 3 times a week	At least once a week	At least once a month	Less than once a month	Never
out-of-home consumption						
at-home consumption						

6. Over the past month, could you count the different seafood species you have eaten? *

Please choose **only one** of the following:

- 0
- 1
- 2 to 4
- 5+

7. Could you name the seafood species you eat? *

Please choose **only one** of the following:

- I know the species I eat
- I don't know the species I eat.
- I don't eat seafood.

8. Could you precise: * Please write your answer here:

Only answer this question if the following conditions are met:

Answer was 'I know the species I eat' at question '7 [HABCONSOPDM4]' (Could you name the seafood species you eat?)

9. In what forms do you prefer to eat seafood? (in order of preference) *

All your answers must be different and you must rank in order. Please select from 1 to 8 answers.

Please number each box in order of preference from 1 to 8. Please choose at least 1 items.

- Cooked fish steak or fillet
- Cooked shellfish or crustacean
- Raw fish
- Raw shellfish or crustacean
- Spreads
- Seafood-based sauces (fish fumet, etc.)
- Elaborate dishes (ex : Seafood Chowder, Lemon-Parsley Baked Cod, etc.)
- I do not eat seafood

Theme 1.2 Meat consumption habits

10. Where do you normally buy your meat? (for home consumption) *

Please choose **only one** of the following:

- In supermarkets (including click and collect, but excluding butchers)
- In a supermarket butcher's shop
- Independent butchers
- Direct sale (farmer)
- On the internet, by delivery (excluding click and collect)
- In general, you hunt for the meat you eat
- Through food aid associations
- You do not buy meat

11. You're used to eating meat... *

Please choose the appropriate response for each item:

	Everyday	About 3 times a week	At least once a week	At least once a month	Less than once a month	Never
out-of-home consumption						
at-home consumption						

12. Over the past week, could you count the different animal species you have eaten? (Excluding aquatic species) * Please choose **only one** of the following:

- 0
- 1
- 2 to 4
- 5+

for example: beef, chicken, duck, ...

13. Can you name the animal species you eat? (Excluding aquatic species) *

Please choose **only one** of the following:

- I know the species I eat, name them in the comment box :
- I don't know the species I eat.
- I don't eat meat.

14. Could you precise: * Please write your answer here:

Only answer this question if the following conditions are met:

Answer was 'I know the species I eat, name them in the comment box :' at question '13 [HABCONSOVND4]' (Can you name the animal species you eat? (Excluding aquatic species))

15. In what forms do you prefer to eat meat? (In order of preference) *

All your answers must be different and you must rank in order. Please select from 1 to 6 answers.

Please number each box in order of preference from 1 to 6. Please choose at least 1 items.

- Cooked piece of meat
- Raw meat
- Spreadable (ex: pâté)
- Meat or carcass-based sauce (stock, broth, etc.)
- Prepared dishes (ex: black pudding, Coddle, etc.)
- I don't eat meat

Theme 1.3 Seafood perception

16. In your opinion, regardless of the packaging, seafoods... *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Somewhat agree	Strongly agree	No opinion
Have high quality flavours.					
Are good for your health.					
Present health risks.					
Are not festive food.					
Are expensive food.					
Are difficult to cook.					

Theme 1.4 Meat perception

17. In your opinion, regardless of the packaging, meat... *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Somewhat agree	Strongly agree	No opinion
Has high quality flavours.					
Is good for your health.					
Presents health risks.					
Is not festive food.					
Is expensive food.					
Is difficult to cook.					

Theme 2.1 Environment

18. Please note how often you perform these actions: *

Please choose the appropriate response for each item:

	Never	Rarely	Often	Systematically
I buy my food in bulk (rice, pasta, cereals).				
I get around by bike or on foot whenever possible.				

	Never	Rarely	Often	Systematically
I buy new clothes at least once a month.				
I throw away my small electrical appliances when they no longer work (toaster, kettle, lamps, calculators,...).				
I prefer the train for journeys that allow it, rather than the plane or car.				

19. Which statement(s) do you think is (are) the most true for you? *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
We are approaching the limit of the number of people the earth can support.					
Humans have the right to modify the natural environment to suit their needs.					
When humans interfere with nature it often produces disastrous consequences.					
The earth has plenty of natural resources if only we knew how to make better use of it.					
Plants and animals have as much right as humans to exist.					
The balance of nature is strong enough to cope with the impacts of industrialisation.					
Despite our special abilities humans are still subject to the laws of nature.					
The so-called "ecological crisis" facing humankind has been greatly exaggerated.					

Theme 2.2 Health and nutrition

20. In your opinion... *

Please choose the appropriate response for each item:

	Strongly disagree : 1	2	3	4	Totally agree : 5
Seafood are particularly high in protein.					
As part of a balanced diet, seafoods are of general nutritional interest.					

21. Would you be prepared to consume seafood-based food supplements? *

Please choose the appropriate response for each item:

	Strongly disagree: 1	2	3	4	Totally agree: 5
For health benefits.					
For aesthetic benefits.					

22. In your opinion, in Ireland, seafood products... *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Somewhat agree	Strongly agree	No opinion
That I'm familiar with, present a health risk.					
That I'm not familiar with and sold in supermarkets, present a health risk.					
That I'm not familiar with and sold in a fishmonger's shop, present a health risk.					
That I'm not familiar with and served cooked in a restaurant, present a health risk.					

	Strongly disagree	Disagree	Somewhat agree	Strongly agree	No opinion
That I'm not familiar with and served raw in a restaurant, present a health risk.					
That I'm not familiar with and served at a family meal, present a health risk.					

Theme 2.3 Economy

23. In your opinion, what characteristics should a seafood product have for you to buy it? *

Please choose the appropriate response for each item:

	not at all important	not very important	fairly important	very important
It has to be caught by a fisherman from my country, and he has to get what I think is a fair return.				
It must take into account the sustainability of ecosystems so that future generations can continue to consume them.				
It must come from a business or brand that I have absolute confidence in.				
It must be designed to be as environmentally friendly as possible, from the moment it is caught to the moment I buy it.				
It must be usable in its entirety without waste or loss.				
It must come from aquaculture.				
The price must be as low as possible so that everyone can have access to it, whatever their income.				

Theme 3 By-products and by-catch

24. Would you be prepared to eat crisps made from grilled, flavoured fish skins? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

25. Would you eat a fish sauce made from powdered fish bones? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

26. Would you be prepared to eat white or black pudding made from fish tripe? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

27. Would you be prepared to eat spreadable made from leftover fish flesh? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

28. Would you eat a sauce made from a shellfish carcass (lobster bisque)? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

29. Would you be prepared to eat seafood you don't know, sold in a shop you usually frequent? (unusual seafood) *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

30. Would you be prepared to eat several fish of a smaller size than the whole fish you usually buy, for the same quantity/quality/price ratio? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

Example: Buy several small bream instead of one large individual bream.

Theme 4 Species 1

31. Would you be prepared to consume this product?



Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

32. Would you be prepared to consume this product if you knew it came from a local fishery? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

33. Would you be prepared to consume this product if you knew it came from a local fish farm? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

34. Would you be prepared to consume this product knowing that it was caught as close to your home as possible and that it was fresh from the sea? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

35. Would you be prepared to consume this product if it were served at a family meal? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

36. Would you be prepared to consume this product if it had been recommended to you by someone close to you? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

37. Would you be prepared to consume this product knowing that it is a sea cucumber, otherwise known as holothuria, and that its taste and texture are similar to oysters? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

38. Do you know about sea cucumbers? *

Please choose **only one** of the following:

- yes
- no

39. Do you know that sea cucumbers are edible? *

Please choose **only one** of the following:

- yes
- no

40. Have you ever eaten sea cucumbers or a product containing sea cucumbers? *

Please choose **only one** of the following:

- yes
- no

41. Traditionally in East Asia, sea cucumbers are eaten dried and seasoned in powder form. Would you be prepared to consume this product in this form? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

42. Traditionally in East Asia, sea cucumbers are also dried and rehydrated in a broth or soup. Would you be prepared to consume this product in this form? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

Theme 4 Species 1 – environmental information

To reduce industrial pressure on the marine biosphere, we need to come up with more sustainable and environmentally-friendly models. This is the aim of developing sea cucumber consumption on the Atlantic coast. This would be a first step towards increasing species diversity to reduce overexploitation. The texture may seem different to what you're used to eating, but it's first and foremost an experience, and eating it could in some way help to save the oceans and the creatures that live in them.

43. Bearing in mind the information you have just been given, how would you answer this question again? (Question 31 to 36, and 41-42)

Theme 4 Species 1- health information

Sea cucumber production and product diversification could improve access to essential nutrients for everyone. The texture may seem different from what you're used to eating, but it's first and foremost an experience. The health benefits of this product and its positive medicinal properties have been widely accepted in traditional Chinese medicine. Mainly, they can contain a high amount of protein between 20-55% and very little fat. They also contained high levels of essential amino acids, essential fatty acids and collagen. Sea cucumber improves blood circulation and stimulates the libido.

43. Bearing in mind the information you have just been given, how would you answer this question again? (Question 31 to 36, and 41-42)

Theme 4 Species 2

31. Would you be prepared to consume this product? *



Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

32. Would you be prepared to consume this product if you knew it came from a local fishery or aquaculture?*

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

33. Would you be prepared to consume this product knowing that it was caught or grown as close as possible to where you live and that it was fresh from the very beginning? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

34. Would you be prepared to consume this product if it were served at a family meal? *

Please choose **only one** of the following:

- | | |
|---------------|-------------------------------------|
| • By no means | • Just to try |
| • Unlikely | • Definitely, I think I'd like that |

35. Would you be prepared to consume this product if it had been recommended to you by someone close to you? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

36. Would you be prepared to consume this product, knowing that it is edible seaweed from the Atlantic coast and that its taste is similar to an iodised salad with a texture that is a little harder to chew? *

Please choose **only one** of the following:

- By no means
- Unlikely
- Just to try
- Definitely, I think I'd like that

37. Do you know about seaweed? *

Please choose **only one** of the following:

- yes
- no

38. Do you know that seaweed is edible? *

Please choose **only one** of the following:

- yes
- no

39. Have you ever eaten seaweed or a product containing it (e.g. sushi)? *

Please choose **only one** of the following:

- yes
- no

Theme 4 Species 2 – environmental information

To reduce industrial pressure on the marine biosphere, we need to devise more sustainable and environmentally-friendly models. This is the aim of developing seaweed consumption on the Atlantic coast. This would be a first step towards increasing species diversity and reducing over-exploitation. The texture, although surprising, is not so different from other seafood products, and its consumption could in some way help to save the oceans and the creatures that live in them.

40. Bearing in mind the information you have just been given, how would you answer this question again? (Question 31 to 35)

Theme 4 Species 2- health information

Seaweed production and product diversification could improve access to essential nutrients for everyone. The texture may seem different to what you're used to eating, but it's first and foremost an experience. The health benefits of this product and its positive medicinal properties have been widely accepted in traditional Asian medicine. Seaweed is said to be a powerful antioxidant that slows the effects of ageing, as well as providing many essential nutrients (high content of vitamins A, B, C, and E, essential minerals and fibre).

40. Bearing in mind the information you have just been given, how would you answer this question again?

(Question 31 to 35)

Theme 5 The fisheries and aquaculture sectors

44. Which sentence do you think best describes you? *

Please choose the appropriate response for each item:

	Exactly like me	Looks like me	It's quite far from what I think	It's the opposite of me
Compared to the average person, I know a lot about fishing and aquaculture.				
I know very little about how to assess the quality of seafood products.				
People who know me regard me as an expert on fisheries and aquaculture.				
I don't know much about preparing seafood.				

45. Do you think this information is true or false? *

Please choose the appropriate response for each item:

	TRUE	FALSE	DON'T KNOW
The production method (wild or farmed) is compulsory information on seafood sold fresh.			
The amount of OMEGA3 present in fish does not depend on the species.			
Fish also save energy by swimming in schools.			
Saithe is a species of freshwater fish.			
Oils and meals from wild fish are used as feed for farmed fish.			
As with fruit and vegetables, there are seasons for fish.			
Sea cucumbers belong to the same family of animals as sea urchins.			

TRUE

FALSE

DON'T KNOW

The colour of a salmon fillet cannot be changed by its diet.

Theme 6 Circular economy

46. Which of the following statements do you think are true and which are false? *

Please choose the appropriate response for each item:

TRUE

FALSE

DON'T KNOW

The circular economy consists of producing goods and services in a sustainable way by limiting the consumption and wastage of resources and the production of waste. It's about moving from a throwaway society to a more circular economic model.

Responsible consumption means: taking into account the economic impacts at all stages of the product life cycle when making purchasing choices, whether the buyer is public or private.

As part of the circular economy improving waste prevention, management and recycling, including injecting and using materials from relocated businesses into the economic cycle is essential.

Theme 7 About you

47. What is your job category? *

Choose one of the following answers

Please choose **only one** of the following:

- Armed forces occupations
- Managers
- Professionals
- Technicians and associate professionals
- Clerical support workers
- Service and sales workers
- Skilled agricultural, forestry and fishery workers
- Craft and related trades workers
- Plant and machine operators and assemblers
- Elementary occupations
- No occupation
- Retired

48. What is your net monthly income?

Choose one of the following answers

Please choose **only one** of the following:

- 1000€ or less per month
- Between 1001€ and 1500€ per month
- Between 1501€ and 2000€ per month
- Between 2001€ and 2500€ per month
- Between 2501€ and 3000€ per month
- Between 3001€ and 3500€ per month
- More than 3500€ per month

49. Please indicate to what extent the people described in the following sentences are like you. *

Please choose the appropriate response for each item:

	Exactly like me	Looks like me	It's quite far from what I think	It's the opposite of me
It's very important for them to help their loved ones				
Taking care of the well-being of people close to him/her is important to him/her				
It is important for him/her to maintain traditional beliefs and values				
Following family or religious traditions is important to him/her				
He/she strongly values the traditional practices of his/her culture				

50. How would you describe your eating habits? *

Comment only when you choose an answer.

Please choose all that apply and provide a comment:

- Omnivore (eat everything without particular constraints)
- Flexitarian (eat everything, but with constraints on meat and fish consumption frequency)
- Vegetarian (no meat or fish)
- Vegan (no animal products)
- Other (gluten-free, enriched in ...)

51. For you, a good meal is ... *

Please write your answer here:

52. Have you ever been fishing (angling, diving, etc.)? *

Choose one of the following answers

Please choose **only one** of the following:

- Yes, quite often
- Very rarely
- Never

53. Do you usually eat fish on Fridays? *

Choose one of the following answers

Please choose **only one** of the following:

- Yes, quite often
- Very rarely
- Never
-

A.2 ANNEXE 2 – Descriptives Statics

	France	Ireland	Spain	Portugal	All
<u>Variables</u>					
Age (years)	Mean - sd [Min - Max]				
	45.5-14 [18 - 82]	44.9-13 [18-110]	44.5-12[18 - 81]	43.9-14 [18 -110]	44.7-3 [18-110]
Gender	%				
Female:	49.90	49.10	49.00	49.40	49.75
Male:	50.10	50.70	50.90	50.30	50.10
Do not wish to answer:	0.00	0.20	0.10	0.30	0.15
Main place of purchase	%				
Supermarkets (including click and collect, excluding fish shops)	44.00	56.90	32.70	32.10	41.42
In supermarket fish shops	38.00	22.10	46.20	55.50	40.45
Independent fishmongers	9.30	8.80	18.80	8.10	11.25
Direct sales (fishing/farming)	2.60	2.40	0.50	1.20	1.68
On the internet, by delivery (excluding click and collect)	1.10	2.00	0.80	0.70	1.15
In general, you catch the seafood you eat	0.70	0.20	0.10	0.10	0.28
Within voluntary food aid circuits	0.20	0.50	0.10	0.00	0.20
You don't buy seafood	4.10	7.10	0.80	2.30	3.58
Out of home frequency of consumption	%				
Every day	3.50	3.40	6.60	6.50	4.90
About 3 times a week	7.20	10.10	35.80	37.70	22.70
At least once a week	22.40	25.40	47.60	40.40	33.95
At least once a month	18.90	24.80	7.70	9.20	15.15
Less than once a month	32.50	24.20	2.10	4.20	15.75
Never	15.50	12.10	0.60	2.00	7.55

	France	Ireland	Spain	Portugal	All
At home frequency of consumption			%		
Every day	6.40	4.80	1.50	1.70	3.60
About 3 times a week	13.80	16.80	7.20	5.20	10.75
At least once a week	43.50	48.80	25.50	26.70	36.12
At least once a month	20.80	15.10	34.90	25.70	24.12
Less than once a month	11.50	7.60	26.20	29.50	18.70
Never	4.00	6.90	4.70	11.20	6.70
Number of different species consumed last month:			%		
0 or 1	33.10	35.10	15.40	13.90	24.38
2	59.10	59.30	67.30	70.70	63.10
3 and more	7.80	5.60	17.30	15.40	11.53
Ecological behaviour (1- never to 4 – always)			Mean - sd [Max:4 - Min:1]		
I buy my food in bulk (rice, pasta, cereals)	2.01 - 0.87	2.48 - 0.80	2.08 - 0.87	2.15 - 0.91	2.18 - 0.88
I get around by bike or on foot whenever possible	2.57 - 0.83	2.54 - 0.87	2.90 - 0.84	2.41 - 0.96	2.61 - 0.92
I buy new clothes at least once a month. (<i>inversed</i>)	2.86 - 0.75	2.74 - 0.80	2.68 - 0.76	2.86 - 0.69	2.79 - 0.75
I throw away my small electrical appliances when they no longer work (toaster, kettle, lamps, calculators...). (<i>inversed</i>)	2.53 - 0.86	2.58 - 0.94	2.45 - 0.80	2.58 - 0.94	2.56 - 0.85
I prefer the train for journeys that allow it, rather than the plane or car.	2.12 - 0.93	2.27 - 0.85	2.46 - 0.86	2.29 - 0.87	2.28 - 0.89
Subjective knowledge (1- Opposite of me to 4- Exactly like me)			Mean - sd [Max:4 - Min:1]		
Compared to the average person, I know a lot about fishing and aquaculture.	2.24 - 0.84	2.26 - 0.89	2.33 - 0.74	2.25 - 0.77	2.27 - 0.81
I know very little about how to assess the quality of seafood products (<i>inversed</i>).	2.26 - 0.86	2.30 - 0.87	2.40 - 0.79	2.39 - 0.77	2.34 - 0.83

AQUAFISH 0.0 – Social acceptance

	France	Ireland	Spain	Portugal	All
People who know me regard me as an expert on fisheries and aquaculture.	2.08 - 0.89	2.01 - 0.91 [1- 4]	2.14 - 0.85	1.92 - 0.79	2.04 - 0.86
I don't know much about preparing seafood (<i>inversed</i>)	2.30 - 0.89	2.46 - 0.93	2.48 - 0.84	2.59 - 0.88	2.44 0.89
Objective knowledge (true versus false/don't know)	% good answer				
The production method (wild or farmed) is compulsory information on seafood sold fresh.	61.60	52.10	62.50	73.40	62.10
The amount of OMEGA3 present in fish does not depend on the species.	40.30	41.60	54.90	60.80	49.40
Saithe is a species of freshwater fish.	43.90	14.90	18.50	15.30	23.15
Oils and meals from wild fish are used as feed for farmed fish.	52.40	35.50	45.80	45.90	44.90
As with fruit and vegetables, there are seasons for fish.	63.70	62.70	75.10	82.50	71.00
Sea cucumbers belong to the same family of animals as sea urchins.	26.90	34.90	36.40	24.20	30.60
The colour of a salmon fillet cannot be changed by its diet.	43.20	37.80	35.40	34.20	37.65
Number of observations	1000	1000	1000	1000	4000