

Who is Prepared to Pay For Sustainable Fish? Evidence from a Transnational Consumer Survey in Europe

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ABSTRACT

Sustainability of increasing relevance also for seafood markets. The aim of this contribution is to analyse consumer preferences and their willingness to pay (WTP) for different sustainability claims. The contingent valuation method was applied to elicit consumers' WTP in eight European countries. The WTP varies between seven and almost 20%, depending on attribute and country. Three consumer groups become apparent: the largest group without any additional WTP, a smaller group with a moderate additional WTP of plus 17%, and a very small group with an additional WTP of more than 40%. Clear differences between countries regarding preferences for different sustainability attributes, particularly in the segment with highest WTP are obvious.

Keywords: Contingent valuation; aquaculture; fisheries; seafood; consumer preferences; willingness to pay

1 Introduction

Sustainability has become an important issue also in the seafood sector. Many consumers are increasingly interested in additional product attributes such as eco-friendliness, organic production, and domestic/European origin, given that general expectations with respect to price and quality are met (e.g., Ankamah-Yeboah et al., 2016; Bergleiter and Meisch, 2015; Brécard et al., 2009; Brunsø et al., 2008; Carlucci et al., 2015; Claret et al., 2012; Olesen et al., 2010; Vanhonacker et al., 2011; Whitmarsh and Palmieri, 2011).

In line with the EU strategy for blue growth, sustainable production is promoted as a strategy for growth of the European seafood sector. Seafood which is produced sustainably presumably will be more expensive and will have to be located in higher priced market segments. Therefore, at least some of the consumers have to be convinced that European products are worth higher prices. Recent research shows that the promotion of sustainability in seafood bears potential for product differentiation and thereby higher premiums and market shares (e.g., Ankamah-Yeboah et al., 2016; Asche et al., 2015; Roheim et al., 2011; Jaffry et al., 2004). Earlier research stressed that a particular consumer segment which appreciates additional ethical values of products and is willing to pay higher prices exists (Altintzoglou et al., 2010; Lasner and Hamm, 2014; Mauracher et al., 2013; Risius et al., 2017; Feucht and Zander, 2015).

Against this background, the aim of this contribution is twofold: First, to analyse consumers' awareness, knowledge and their preferences regarding different aspects of seafood, and, second, to elicit their willingness to pay for seafood with different sustainability attributes. In order to cover cultural differences across Europe,

all analyses are conducted in eight European countries. By addressing these topics, this paper contributes to the discussion of how to best communicate sustainability aspects of fisheries and aquaculture to consumers in order to increase their demand for sustainable seafood from Europe.

3 Methodological approach

The present research is based on a survey which consisted of an experiment using the Contingent Valuation Method (CVM) and a questionnaire. The CVM is applied to elicit consumers' preferences and their willingness to pay for seafood with different attributes, all related to sustainable and local/European production.

3.1 Contingent Valuation Method

Several methods exist for analysing consumers' preferences and their willingness to pay (WTP) – among them Choice Experiments (CE) and the Contingent Valuation Method (CVM). During the last several years, choice experiments have become the state of the art in analysing consumers' preferences for market goods with ethical properties such as environmental impacts. In contrast, the CVM has been widely used in environmental economics in analysing preferences for public goods and less frequently in the analysis of preferences for private goods. Examples for its use for private goods are the broad topics of GMO free food (e.g., Loureiro and Bugbee, 2005; Costa-Font et al., 2008) or renewable energy, respectively fuels (e.g., Akcura, 2015; Solomon and Johnson, 2009; Interis and Haab, 2014).

In order to be as realistic as possible, the scenarios have to be easily understandable and simple. Complex designs might question the validity of the results.

3.2 CVM Study design

In this research, a payment card format was chosen to elicit the consumers' WTP (Box 1). Participants were asked to state the amount of money they would spend for a fish to be prepared for an everyday occasion. In order to increase participants' involvement with the willingness to pay exercise and to determine whether the amounts indicated were realistic, they were asked to state the number of people they would be preparing the fish for. Subsequently, participants were asked for their willingness to pay for fish which was caught or produced according to the criteria: sustainably, organic, locally, by coastal fisheries, higher animal welfare standards, in Europe or discard free. The percentages indicated in Box 1 were recalculated to Euro amounts based on the expenses that the participants had indicated in the earlier question. In this manner, a higher proximity to real purchase situations was achieved.

Box 1: Payment scenario of the CVM exercise

Please imagine you are going to shop for fish for an everyday occasion. How much would you spend for this fish in total? Approx. _____ €.

For how many people would you prepare this fish? _____

Based on the price you just indicated for the fish. Imagine that all other properties of the fish (e.g. freshness, taste) which are not mentioned here are in line with what you expect: How much would you be willing to pay for a fish that is caught/ produced...

	100%	105%	110%	...	140%	150%	175%	200%
... sustainably								
... according to organic standards								
... locally (within your region)								
... by coastal fisheries								
... with higher animal welfare standards								
... in Europe								
... discard free								

Note: Percentages were recalculated to total numbers depending on the answers in the first question.

Source: own compilation

3.4 Data collection and sample description

The survey was performed online in March 2016 in eight European countries (Finland, France, Germany, Ireland, Italy, Poland, Spain and the United Kingdom). An online panel run by a private market research agency was used for purposive quota sampling. Quotas were set for gender relations (two thirds women and one third men) considering the fact that even today more women than men are responsible for shopping. With regard to age, representativeness was required. All test persons had to be fish consumers (Plaßmann-Weidauer 2011, Spiller et al. 2004, Zander and Hamm 2010).

The survey was developed in English and German and then translated into the other languages by professional translation services by means of the back-translation method. The content of the survey and the translations were discussed and reflected with the project partners in the respective countries. It was pretested with 15 participants in Germany. On average, participants spent about 20 to 25 minutes to complete the survey including questionnaire and CVM exercise.

In total, 4103 consumers participated in the survey. Across all countries people between the age of 55 to 70 were the most strongly (25%) represented in the sample, whereas the youngest age group (18 to 24 years) with 12% had the lowest share (Table 1). The participants in Poland were slightly younger than in the other countries. The Italian and German participants were somewhat older than in the other countries. In comparison to census data, people with higher education (college or university degree – tertiary level) were overrepresented in our data for France, Ireland, Italy, Poland, Spain and UK. In contrast, in Finland and Germany participants with a low to medium education (no formal education and up to 10 years of school attendance) had a higher presence in the sample than in the census. The dominance of more highly educated people in the majority of the study countries studied might be due to the fact that only fish consumers were allowed to take part in the survey. Myrland et al. (2000) and Hicks et al. (2008) found that people with a higher education level tend to have higher fish consumption.

The highest fish consumption frequency was found in Spain followed by Italy and the UK. Finnish, German and Polish participants consumed often fish much less frequently. The consumption frequencies are in line with findings by DG Mare (2008) and Pieniak et al. (2009), who point out that fish is most frequently consumed in Southern European countries, whereas Polish as well as Germans have a comparatively low fish consumption frequency.

Table 1: Summary statistics of the sample (%)

Variable / Description	Country							
	Finland	France	Germany	Ireland	Italy	Poland	Spain	UK
Number of observations	500	517	530	500	513	502	534	507
Age of test persons								
18 to 24 years	12.2	11.6	11.1	12.2	9.6	13.9	9.9	12.8
25 to 34 years	18.0	19.7	18.3	26.0	17.3	23.9	24.3	19.9
35 to 44 years	21.2	20.7	24.0	22.0	23.8	18.1	23.4	21.3
45 to 54 years	23.2	21.7	20.4	19.2	22.8	18.7	19.1	20.3
55 to 70 years	25.4	26.3	26.2	20.6	26.5	25.3	23.2	25.6
Gender								
Female	65.2	66.7	65.7	64.2	65.3	64.7	64.6	66.1
Male	35.8	33.3	34.3	35.8	34.7	35.3	35.4	33.9
Education (years of school visit)								
No formal qualification	11.0	2.7	0.4	0.6	0.0	1.2	0.6	3.6
About 10 years of schooling	39.4	15.1	48.1	26.8	10.3	8.0	5.1	27.8
12 or 13 years of schooling	30.2	35.6	32.1	23.2	56.1	41.8	48.7	28.4
College or university degree	19.4	46.6	19.4	49.4	33.5	49.0	45.7	40.2
Fish consumption								
Occasional fish consumers	68.0	42.7	57.2	54.4	29.8	58.8	20.9	45.8
Less than once per month	13.2	8.5	8.3	13.8	3.5	9.6	3.7	10.1
Once per month	17.0	9.1	13.2	12.8	4.1	13.9	3.2	8.7
Two to three times per month	37.8	25.1	35.7	27.8	22.2	35.3	14.0	27.0
Regular fish consumers	32.0	57.2	42.8	45.6	70.1	41.3	79.0	66.8
About once per week	21.6	40.4	33.0	27.6	37.0	32.3	33.1	33.7
More than once per week	10.4	16.8	9.8	18.0	33.1	9.0	45.9	33.1

3.5 Statistical analyses

Statistical analyses were performed using the statistical software SPSS Version 24. Bivariate analyses including cross-tabulation with chi-square statistics and one-way ANOVA comparison of means with Tukey post-hoc tests were used to analyse the data. For the values and attitudinal constructs scales were calculated using the means of the corresponding items.

In order to identify different consumer segments, a two-step cluster analysis was conducted. Since for marketing and communication of sustainable seafood, the participants with a medium to high additional WTP are of particular interest, participants were clustered according to their WTP for all sustainability attributes used in the CVM exercise. It was assumed that people with, e.g., a higher WTP for organic production also have a higher WTP for sustainability and so on. And, indeed, the participants' WTP for the different attributes tested was highly correlated and significant (correlation coefficients between 0.6 and 0.77).

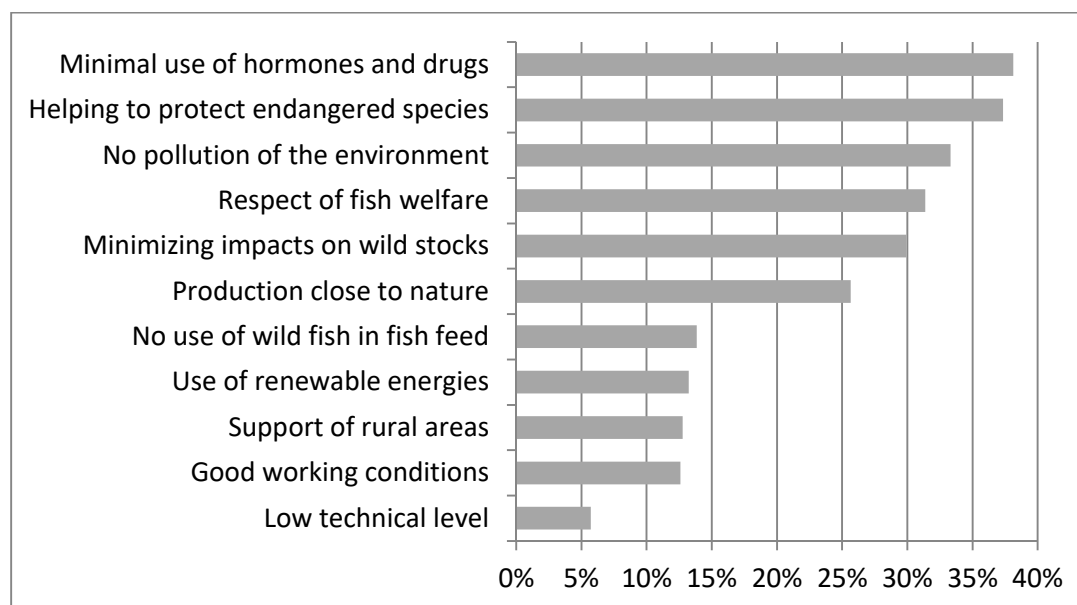
4 Results and discussion

4.1 Awareness of sustainability in aquaculture and fisheries

Sustainability is a very complex issue not only from the technical perspective. Consumers' perception and understanding of sustainability may widely vary from expert definitions, primarily for two reasons: First, the term 'sustainability' is frequently used in many different contexts and consumers associate it with a multitude of issues and, and second, because of their limited knowledge with regard to technical issues of seafood production. When attempting to improve the communication with consumers on sustainability, it is essential to know what consumers think and expect. In this regard, test persons were asked by means of a closed question for the three most decisive elements of sustainability in aquaculture and fisheries.

In aquaculture, the minimal use of hormones and drugs ranks highest, which supposedly has a strong egoistic component since people do not want to consume fish containing residues of either or both substances due to potential health risks (see Figure 1). Nevertheless, the use of hormones and drugs pose an actual threat to the environment in open aquaculture systems (e.g., Jennings et al., 2016). The protection of endangered species ranks lower, followed by the pollution of the environment and minimising the impact on wild stocks. Fish welfare is also an important issue for consumers. Social criteria are less important.

Figure 1: Important aspects of sustainability in aquaculture from the consumers' perspective



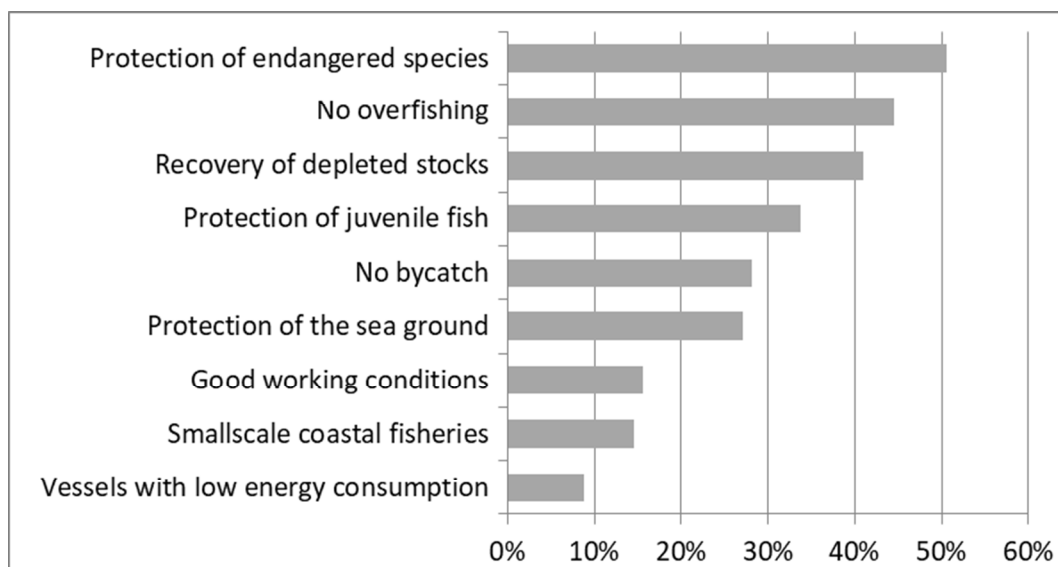
Question asked: Please indicate the three most decisive elements of sustainable aquaculture from your point of view.

Similar results were found in a qualitative study by Feucht & Zander (2015), where minimal use of drugs, naturalness and fish welfare turned out to be important elements of sustainability in aquaculture. The increasing concern of fish welfare issues has some common features with the ongoing public debate and research regarding farm animal welfare (e.g., Janssen et al., 2016, Weible et al., 2016, Di Pasquale et al., 2014; Prickett et al., 2010; Vanhonacker and Verbeke, 2014).

With regard to fishing, consumers' primarily align ecological aspects with sustainability, most important is the protection of endangered species, followed by no overfishing, recovery of depleted stocks, and protection of juvenile fish – all of them related to the protection of aquatic ecosystems (Figure 2). Social/cultural aspects such as good working conditions for fishermen, or support of small scale coastal fisheries are much less relevant. The same applies for the energy consumption of fishing vessels. These results confirm the outcome of

earlier qualitative research on German consumers' understanding of sustainable fisheries: similar ecological issues were discussed, whereas social aspects were completely neglected (Zander et al., 2015). Apparently, Europeans are highly concerned about the danger to aquatic habitats when thinking about topics related to the use of the world's oceans (see also Gelcich et al., 2014; Jefferson et al., 2014). The low importance of social aspects, e.g. employment with respect to sustainability in fisheries has been previously reported (Potts et al., 2016).

Figure 2: Important aspects of sustainability in fisheries from the consumers' perspective



Question asked: Please indicate the three most decisive elements of sustainable fisheries from your point of view.

4.2 Relevance of the geographic origin of seafood

As summarised above, the product's geographic origin and mainly local production is an important issue in many food markets. In this research, test persons were asked for the relevance of European, domestic and local origin when buying fish (Table 2). Looking at all countries studied, domestic production was important to the largest fraction of the participants, followed by local and European production. Domestic production was particularly important in the Mediterranean countries (Italy, France and Spain). Compared to European and domestic production, local production was most important in Finland and in the UK. Polish and Germans considered European production to be particularly important.

Table 2: Preferences for the origin of fish (% of participants)

...production	Finland	France	Germany	Irleand	Italy	Poland	Spain	UK
European...	53.4	60.3	53.6	48.4	61.2	63.1	58.8	42.2
Domestic...	50.2	76.4	45.3	71.0	82.8	63.9	76.6	51.1
Local...	58.2	55.5	45.7	72.2	73.3	46.4	72.3	60.6
N	500	517	530	500	513	502	534	507

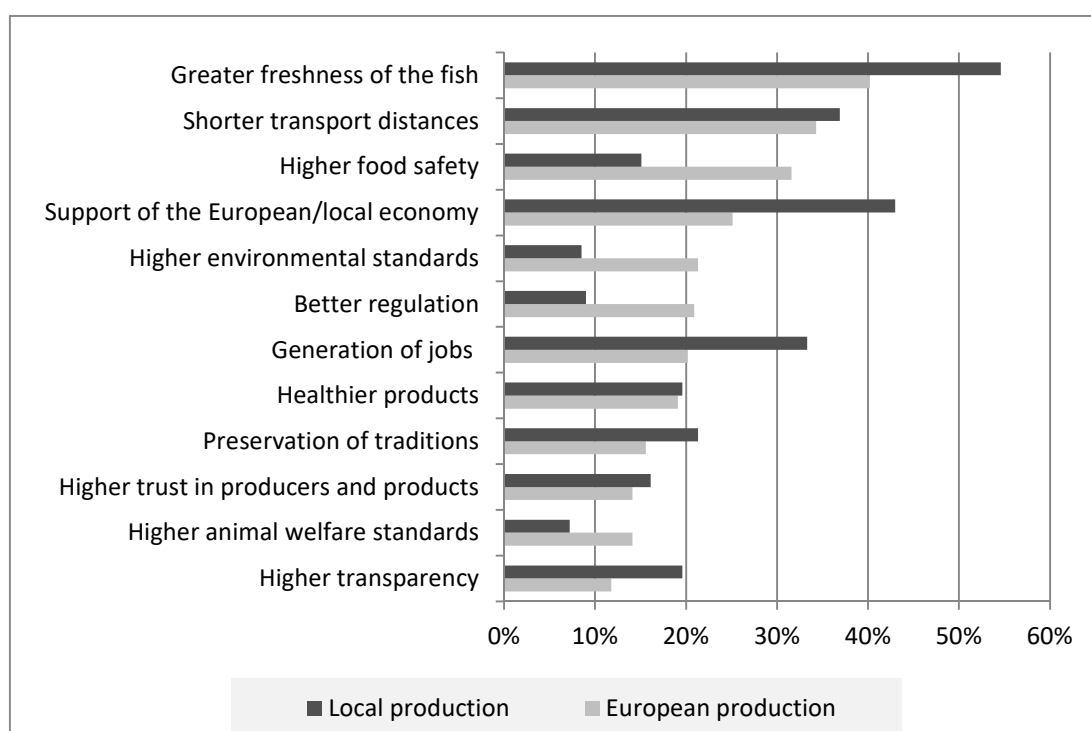
Question: Is it important to you that the fish you buy originates from...

These results are consistent with earlier research on the general relevance of the geographical origin of seafood and the preference for local and domestic fish products over foreign products (Brécard et al., 2009;

Claret et al., 2012; Jaffry et al., 2004; Mauracher et al., 2013). With respect to European origin, Pieniak et al. (2013) found low interest in such an indication compared to mandatory indications (e.g., nutritional information) and indications of sustainability and fish welfare. They argued that European origin might be too broad and therefore meaningless.

The participants who indicated that European and/or local production were important in their buying decision were asked for the reasons. They had to select three out of 12 possible reasons. Greater freshness of the fish turned out to be the most important reason for any geographical preference (Figure 3). Shorter transport distances were very important for both origins. Further reasons for preferences of European production were higher food safety, higher environmental standards, and better regulations. Hence, consumers obviously realise and appreciate the effect of the common EU regulation and standard setting regarding food safety and environment. Local production was looked for because it supports the local economy (e.g., by generating jobs) and for preservation of traditions and higher transparency. This last aspect is quite similar to the findings of Brécard et al. (2009) and Claret et al. (2012), who identified 'ethnocentrism'¹ and higher familiarity with local conditions as reasons for preferring local seafood.

Figure 3: Reasons for the purchase relevance of European and local production



Note: Fraction of test persons indicating that European and/or local production are important within the purchase decision.

Question: Why is local production important to you? / Why is European production important to you?

¹ In this context, ethnocentrism refers to people's perception of their own culture/country as superior to others.

4.2 Consumers' willingness to pay for different sustainability attributes

This section focuses on consumers' willingness to pay (WTP) for different sustainability attributes. Since communication of this complex issue is difficult for various reasons (as explained above), different attributes were tested in a comparative manner. We used the Contingent Valuation Method (CVM) and asked test persons directly for their WTP. This section begins by showing the average numbers of participants' WTP, followed by clustering test persons according to their WTP, and closes with a tentative description of consumers with medium and high WTP.

Test persons were asked for their additional WTP for seven different product attributes, all related to sustainability, i.e. 'sustainably produced', 'organically produced', 'locally produced', 'produced according to higher animal welfare standards', 'produced by coastal fisheries (no deep sea-fishing)', 'produced without causing discards' and 'produced in Europe'. 'Sustainably produced' was included because it can be taken as umbrella term for all the other issues or inclined attributes asked for and, thus, might be preferred by consumers over isolated sustainability issues.

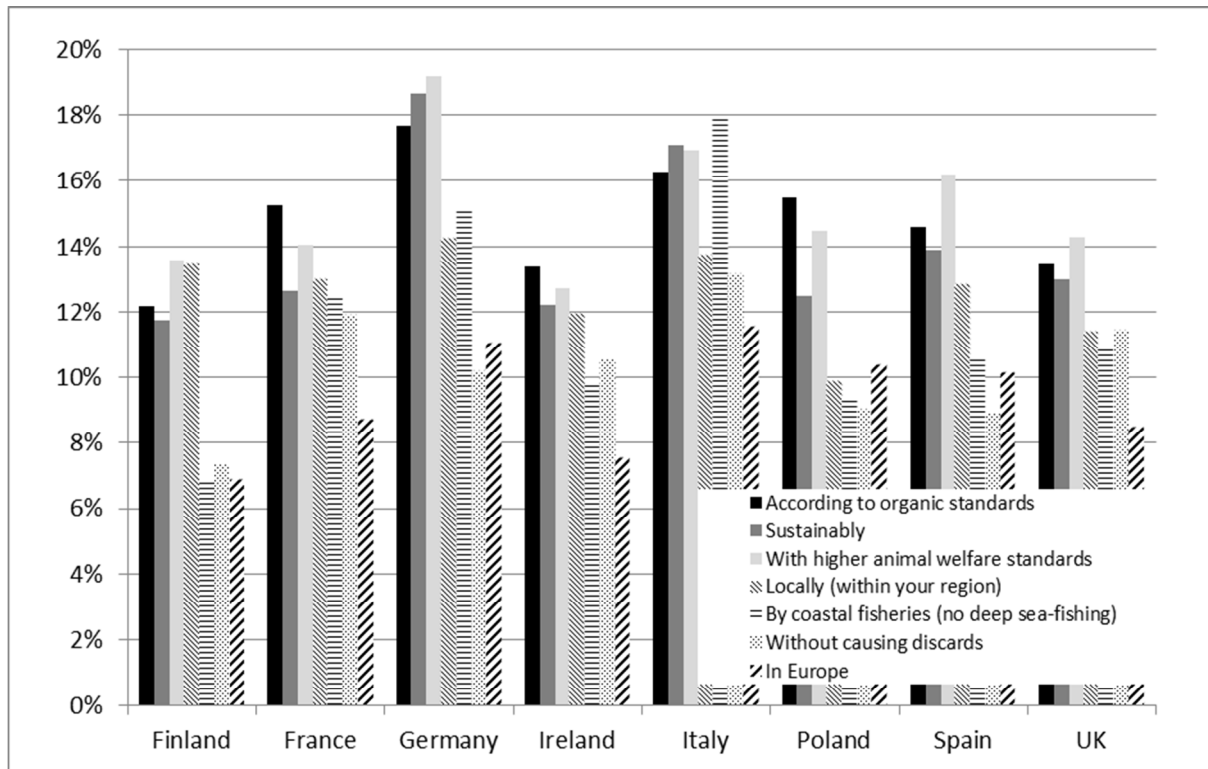
The analyses show that the average WTP differed largely between attributes. On average of all countries, additional WTP was highest for organic production (+14.8%), followed by sustainably produced (+14%), produced with higher animal welfare (+14%), locally produced (+12.6%), by coastal fisheries (+11.7%), without discards (+10.3%), and produced in Europe (+9.4%). Thus, organic and sustainable production as well as higher animal welfare standards, appear to be the most promising attributes with respect to product differentiation in European fish markets.

The results by country, which result in a quite diverse picture, are more interesting than averages (Figure 4). The highest overall level of additional WTP was observed in Germany followed by Italy. Whereas in Finland, Germany, Spain and the UK, WTP was highest for higher animal welfare standards; organic production was the most important attribute in France, Ireland and Poland. Whereas in almost all countries, caught 'by coastal fisheries' was of minor relevance, in Italy it resulted in the highest WTP on average. Local origin was particularly important in Finland; in all other countries, it was beaten by production practices, such as sustainably, organic or animal welfare aspects. Although European origin was associated with higher environmental standards, higher safety and better regulation (Figure 3), in this analysis it resulted in the lowest additional WTP. This shows that consumers appreciate European origin and are even prepared to pay a price premium for the potentially higher production costs. But this result also highlights the fact that consumers attach higher values to more concrete sustainability attributes, which are only partly reflected in the associations connected to European origin. Given this, European origin might be perceived by European consumers as kind of a minimum baseline for sustainable production.

Discard-free fishing was perceived to be of minor importance in this survey. This is interesting in light of the high consumer concern for the conservation of marine ecosystems found in this research and by Gelcich et al. (2014) and Jefferson et al. (2014), and the fact that discards can result in substantial overfishing of other fish stocks. Therefore, it would have been expected that consumers would attach higher values to discard-free fishing. One reason for the low WTP might be the limited knowledge of many consumers about fisheries, another reason might be that consumers feel that 'sustainability' covers more relevant issues including discard-free fishing. In this light, the higher WTP for sustainable production is reasonable.

Our results confirm earlier research, which stressed the importance of animal welfare considerations in consumer demand (e.g., Feucht and Zander, 2016; Kupsala et al., 2013). With regard to the relevance of local or domestic production, these results are only partly in line with earlier research in which consumers preferred local over sustainable production (Claret et al., 2012; McClenachan et al., 2015; Risius et al., 2017), which in this research is only the case for Finland and France. The low additional WTP of European origin is in line with Pieniak et al. (2013), but contradicts Altintzoglou et al. (2010), who found that the indication of European origin enhanced the image of fish.

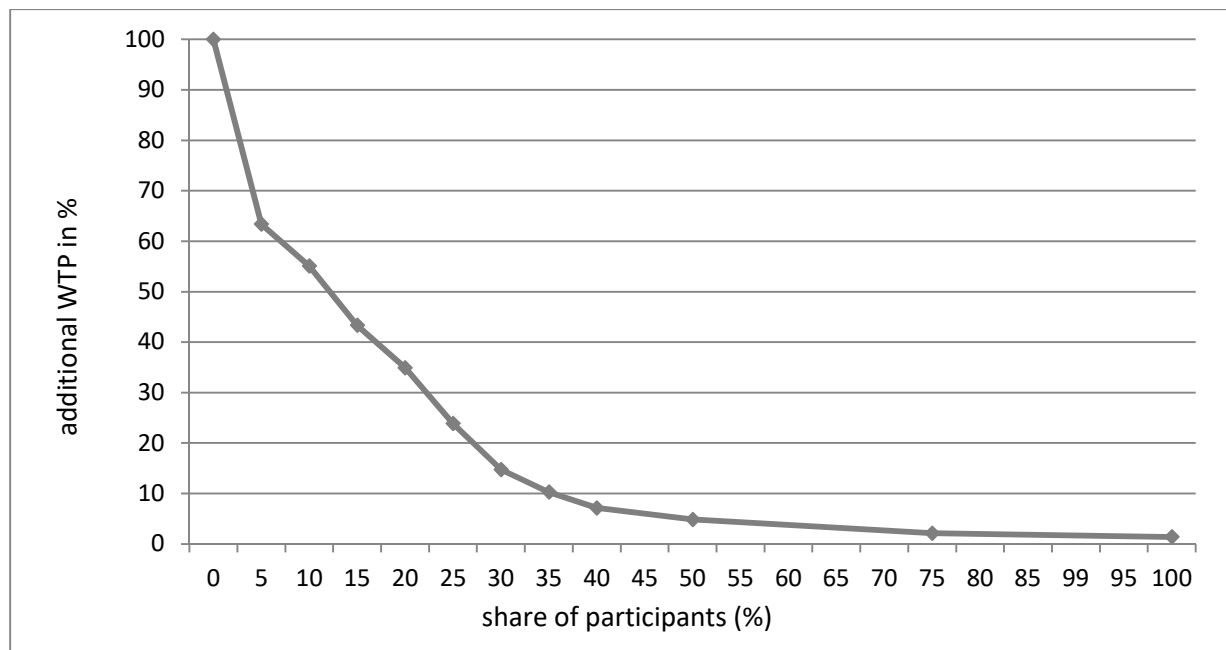
Figure 4: Average WTP for different sustainability attributes



Source: Own data

Question: How much would you be willing to pay for a fish that is produced...?

These average numbers only provide a first impression of relative WTP and preferences between countries and attributes since it merges the WTP of people without any WTP and those with a high WTP. It is obvious that the WTP strongly varies among consumers since some of them are willing to pay significantly more for sustainably produced seafood while others are indifferent and do not react to any indication in this regard. With the example of participants' answers on their WTP for 'sustainably produced' seafood the distribution of the WTP is shown in Figure 5. This way of presenting the results on consumers' WTP resembles the well-known micro economic demand curve. A small part of the consumers are willing to pay (very) high prices and decreasing prices lead to larger shares of people willing to accept the prices.

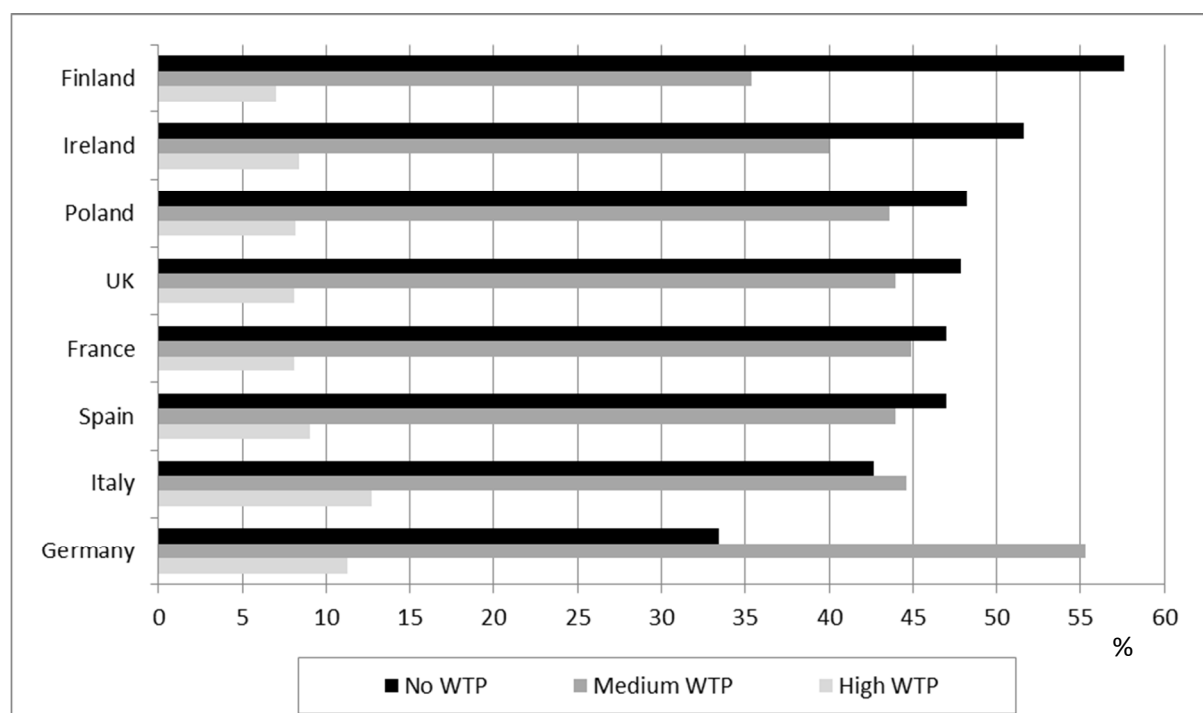
Figure 5: Distribution of consumers' WTP for 'sustainably produced' seafood

4.3 WTP in different consumer segments

For marketing and communication of sustainable seafood, the participants with a medium to high additional WTP are of particular interest. Therefore, a (two-step) cluster analysis was conducted on the WTP for all sustainability attributes to identify various consumer segments. Three clusters were found: The first 'No WTP' with an additional WTP of almost zero (+2%), the second cluster 'Medium WTP' with an additional WTP of 17% on average, and a third cluster 'high WTP' with an additional WTP of 43% on average.

On average of all countries, the fraction of participants in the cluster 'No WTP' was 47%, in cluster 'Medium WTP', 44%, and in cluster 'High WTP', 9%. There are some differences between countries (Figure 6). Study countries are arranged according to the fraction of respondents in the Cluster 'No WTP'. The fraction of people with high additional WTP is highest in Italy with 12.7%, followed by Germany (11.3%) and Spain (9.0%). The size of the cluster 'No WTP' is between 43 and 58% in all countries with the exception of Germany, where this share is only 33%.

Figure 6: Size of consumer segments based on their WTP on average of all sustainability attributes by country (share of respondents per cluster)



Source: Own calculations

5 Conclusions

The results of the survey reveal that in all study countries participants had a rather positive attitude towards sustainability in aquaculture and fisheries. Protection of endangered species, no pollution and absence of drugs and hormones in production and fishing were the most important issues from the consumer perspective. Considering the high sensitivity for the use of drugs in aquaculture, the industry should ensure the production of safe and healthy food and should try to highlight its capacities in this respect.

The majority of the consumers stated that they preferred fish from local, domestic or European production. This shows the potential of European seafood in the markets. When looking at consumers' WTP, it becomes apparent that local production activates an additional WTP, whereas European production has a much smaller effect. Other sustainability attributes result in even higher additional WTP among consumers, which indicate that sustainable production made in Europe might be a promising approach in European seafood markets.

The results clearly demonstrate that there is a very small consumer segment with a high WTP and a larger segment with a medium WTP for fish produced according to sustainable production methods and from European origin. About 9% of the consumers belong to the high WTP segment with a WTP of 40 to 50%. Another 44% has a marked additional WTP of about 20%.

Sound communication, considering specific consumer interests and focusing on animal welfare, specific sustainability issues and/or organic production is necessary and promising. With respect to sustainability issues, communication should focus more on environmental sustainability than on economic and social sustainability. For the fisheries, as well as the aquaculture sector, the conservation of biodiversity is an important issue.

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