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CONSUMER AWARENESS, PERCEPTIONS AND BEHAVIOUR TOWARDS FARMED VERSUS WILD FISH

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Abstract

This study provides empirical evidence about European consumer awareness, perceptions and behaviour towards farmed and wild fish. The evidence is based on three empirical studies: a consumer survey in Belgium in March 2003, focus group discussions with consumers in Belgium and Spain in May 2004, and a pan-European consumer survey with a sample of 4,786 fish consumers in Belgium, the Netherlands, Denmark, Spain and Poland in November-December 2004. Consumer awareness about the farmed or wild origin of fish is rather poor, particular among lighter fish user groups. Perceptions are quite diverse across Europe. Furthermore, perceptions often contrast with current scientific evidence, in particular with respect to health and nutritional value where consumers express more favourable perceptions for wild than for farmed fish. Finally, perceptual differences between farmed and wild fish with a country are not always consistent across countries.

Keywords: attitude, aquaculture, consumer, fish, SEAFOODplus

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1. Introduction

Thanks to its predominantly healthy and nutritious image, the consumption of fish and seafood products has increased over recent decades. Fish is considered as an important part of a healthy human diet, mainly owing to the presence of omega-3 (n-3) polyunsaturated fatty acids (PUFA), which play an essential role in human health (Ruxton *et al*., 2005), and the presence of vitamins, minerals and proteins with a high biological value, which provide fish with high nutritional qualities for consumers (Sidhu, 2003). However, widespread unsustainable fishing practices have left capture fisheries with a shrinking resource base, which has led to a decreasing contribution from wild fisheries to fish food security (FAO, 2004) and to increased fish prices at the consumer level (Guillotreau, 2004). In response to the depleting wild fish stocks and the increasing consumer demand for fish, consumers are now being offered farmed or aquacultured fish as a valuable alternative (Cahu *et al*., 2004). The aquaculture sector has been among the fastest growing food production sectors of the world (FAO, 2000), with production evolving from around 4 million metric tonnes in 1980 to around 38 million metric tonnes in 2002. Forecasts based on economic supply and demand analysis hold that farmed fish supply might overtake wild fish supply volume within 20-25 years from 2005 (Arnason, 2006, this volume). These evolutions and forecasts yield a growing interest in and trigger public debates about issues related to farmed versus wild fish (EFSA, 2005).

When comparing capture fisheries with aquaculture, the major issues of societal and consumer interest pertain to the nutritional composition and healthiness of fish; the food safety aspect related to fish; and sustainability issues of fish capture and aquaculture. Current consensus holds that the nutritional content and healthiness of farmed fish is at least as beneficial as that of wild fish, particularly in terms of preventing cardiovascular diseases (Cahu et al., 2004; EFSA, 2005). With respect to fish safety, no clear-cut conclusions have been drawn thus far as to whether farmed fish is safer than wild fish or *vice versa*. Safety depends on multiple factors including the species, its origin, the tissue sampled, season of the year, the capture area for wild fish, and the feeding regime and aquacultural practices for farmed fish. However, there is consensus that the presence of toxic contaminants can be more easily controlled and monitored in farmed fish than in wild fish (Cahu *et al*., 2004). Whereas the diet of wild fish is beyond human control, the development of formulated diets, which are used in aquaculture, makes it possible to more directly control tissue contaminant levels (Fauconneau, 2002; EFSA, 2005). Finally, sustainability issues are relevant for both wild and farmed fish. Major issues of concern with respect to wild fish pertain to endangering natural fish stocks, while residues and environmental externalities are top-of-mind sustainability issues in fish farming (Troell *et al.*, 2003).

Consumer acceptance is crucial for the future market success of aquaculture products (Kaiser and Stead, 2002). General consumer perception about fish has recently received considerable attention (Brunsø, 2003; Kole, 2003; Arvanitoyannis et al., 2004; Batzios et al., 2004; Verbeke and Vackier, 2005; Verbeke et al., 2005;). These studies have investigated socio-demographic and attitudinal determinants of fish consumption and have consistently confirmed fish's predominantly healthy image. However, they also report gaps between consumers' subjective perceptions of fish

versus objective scientific evidence. Little effort has been devoted thus far specifically to explore consumer awareness and perceptions about farmed *versus* wild fish. A notable exception is a study by Luten *et al*. (2002), who concluded that wild and farmed cod quality was equally appreciated by Dutch consumers, in contrast with expert opinions that were in favour of wild cod.

In response to the gap in current knowledge about wild and farmed fish consumer perception, the objective of this paper is to provide empirical evidence about consumer awareness, perception or attitude, and behaviour towards farmed fish and wild fish. First, the different data sources will be introduced, and then empirical findings are presented and discussed.

2. Data sources

The findings presented in this paper result from three different primary data sources. First, exploratory insights were obtained through a preliminary consumer survey in Belgium during March 2003. A total of 429 individuals responsible for food purchasing, comprising 284 women (66.2%) and 145 men (33.8%) were personally contacted and asked to complete a self-administered questionnaire. A quota sampling procedure with age as the main quota control variable was applied. Additional sampling restrictions pertained to education, family size and the presence of children. The sample covered a wide range of consumers in terms of socio-demographics, though younger respondents (<25 years) were slightly over-sampled compared to the population. Readers are referred to Verbeke *et al*. (2005; 2006) for further methodological details.

Second, the insights from the Belgian survey were complemented with exploratory insights obtained through focus group discussions in Spain and Belgium during May 2004. These focus group discussions were performed within the EU Sixth Framework Programme integrated project SEAFOODplus. All in all, six consumer focus groups were conducted, three in Belgium and three in Spain, with six to eight participants in each group. All participants were women, aged 25–60, responsible for purchasing and preparing fish for at home consumption. The participants covered a wide range of socio-economic profiles, including a variety of educational and professional backgrounds, income classes, family sizes, and places of residence, though without being representative of the population from a statistical point of view. In both countries, one heavy-user group and two light-user group discussions were carried out in order to get information from users with different degrees of involvement with fish. This composition of groups aimed also at obtaining in-depth knowledge of motives for eating fish and in particular barriers preventing consumers from eating more fish.

Third, quantitative cross-sectional data were obtained in November-December 2004 from a total sample of 4,786 consumers in Belgium, the Netherlands, Denmark, Spain and Poland, with samples being statistically representative for age and region within each country. A common questionnaire was developed covering a wide variety of constructs, including fish consumption behaviour, attitude, beliefs, knowledge, interest in information and perceptions about farmed and wild fish. In order to ensure translational equivalence and cross-cultural comparability among countries, back-translation methodology was applied (Samiee and Jeong, 1994), and in each country professional market research agencies were responsible for the data collection. All

respondents included in the sample were responsible for food purchasing within their households. From this dataset, the focus in this paper is on differences between farmed and wild fish perception of healthiness and nutritional value, safety and ethical issues.

3. Exploratory findings

3.1 Consumer survey in Belgium March 2003

Belgian consumers were asked to evaluate wild relative to farmed fish with respect to - among others - perceived taste, healthiness, nutritional value, safety, and availability (Table 1).

Table 1: Consumer perception of wild versus farmed fish, frequency distribution (%, n=429), mean score and standard deviation (S.D.) on 5-point scale, t-test statistics for mean = 3

Item	Strongly disagree / disagree	Neutral	Agree / Strongly agree	Mean	S.D.	t-value
Wild fish compared to farmed fish is / has:	11.0	51.0	38.0	3.32	0.75	8.75*
Better taste	18.1	53.8	28.1	3.13	0.79	3.27*
Healthier	12.1	68.3	19.6	3.10	0.64	3.29*
More nutritious	22.0	60.8	17.2	2.96	0.74	-1.13
Safer	32.3	58.0	9.7	2.74	0.74	-7.28*
More available						

** : p-value <0.001*
Source: Consumer survey in Belgium March 2003

The mean perception scores on most of the attributes are in the neighbourhood of the mid-point of the five-point scale, hence denoting absence of major perceived differences between farmed and wild fish. Nevertheless, the mean perception score on the attributes taste, healthiness, nutritional value and availability differed significantly between wild and farmed fish. The lowest degree of ambiguity is seen for taste and healthiness perception. Respondents seemed to hold the idea that wild fish has a better taste, is healthier and has a higher nutritional value than farmed fish. Specifically, more than one third of the respondents held a strong belief that wild fish has a better taste (mean=3.32), while 28% believed that wild fish is healthier (mean=3.13) than farmed fish, and almost 20% believed that wild fish is more nutritious (mean=3.10). With respect to perceived availability, the respondents ascribed a significantly higher score to farmed fish. Almost one third of the respondents were convinced that farmed fish is more easily available than wild fish. Finally, it is notable that 22% of the respondents disagreed that wild fish is safer than farmed fish. Nevertheless, the

difference in safety perception about farmed versus wild fish was not statistically significant. In sum, this first study indicates that consumer perceptions in Belgium are slightly in favour of wild fish, in particular with respect to taste, healthiness and nutritional value. In order to understand the grounds for these perceptions, further empirical evidence was gathered through focus group discussions (see next sections).

3.2 Focus group discussions May 2004

Foremost, the issue of wild versus farmed fish was not spontaneously mentioned during the focus groups discussions, which indicates that this issue is not *at the front* of *the* mind among fish consumers. Only upon probing or after introducing the issue, *did* participants start to discuss differences between farmed and wild fish. After introducing the concept of capture fisheries and aquaculture, consumers appeared to associate wild fish in general as more natural, more healthy, better in taste and more expensive than farmed fish. Participants in Belgium were hardly aware of any farmed fish species *other* than salmon. Although awareness about the existence of aquaculture was higher in Spain, most of the participants had not really thought about the farmed or wild origin of the fish they buy. Wild fish was associated with 'living free' and 'happier fish'. Owing to this idea of *higher* fish well-being, wild fish was perceived as being more resistant against 'everything', including chemical and microbial contamination.

Although they had no apparent awareness of farmed fish production systems, light fish users in particular perceived farmed fish as unnatural, less healthy and cheaper than wild fish. Parallels with intensive terrestrial livestock farming were easily drawn, and stereotypical images from these practices were projected onto fish farming. Some of the participants associated fish farming with laying hens in battery cages, i.e. stressful environments and high stocking densities. Fish farming was also associated with excessive use of artificial colorants and preventative antibiotics, which were perceived to addto contaminants already present in the natural environment.

The participants in the focus groups of heavy fish users were more open to aquaculture. First of all, they appeared to have a better awareness of aquaculture, and secondly, they were not strongly convinced that only wild fishing has advantages and offers benefits. They held more moderate opinions, and did not heavily defend or compare one production system and its resulting end-user products over the other. Nevertheless, there were participants who claimed that wild fish caught in the sea is much fresher than farmed fish, but there were doubts as to whether this in general results in better-quality fish.

Issues pertaining to sustainability were also mentioned. Some participants in the heavy user group were aware of the fact that aquaculture aims at providing a solution to depleting natural fish stocks, and that fish is still affordable owing to the increasing production from fish farming.

In conclusion, the discussions about fish consumption in general, and wild *versus* farmed fish perception in particular, indicated that consumers did not have any specific *a priori* preference for wild or farmed fish. This belief held as much for light as for heavy users. The light users were largely unaware of the existence of fish farming, but

after probing immediately drew stereotypic parallels with intensive livestock farming. The heavy-users had a higher awareness of different seafood sources, but still a limited knowledge of aquaculture and its potential benefits over wild fisheries. In general, consumers seemed to associate wild fish with aspects such as "more natural", "more healthy" and "better tasting", which confirmed the findings from the March 2003 survey in Belgium (see previous section).

4. Pan-European SEAFOODplus consumer survey

4.1 Knowledge of the wild or farmed origin of fish

Consumers' objective and subjective knowledge about fish were measured using multiple items (Verbeke and Pieniak, 2005). Objective knowledge refers to consumers' accurate knowledge about a product class as stored in their long-term memory, whereas subjective knowledge pertains to the consumer's self-assessment or belief about what or how much they know about a product class (Brucks, 1985; Park *et al*., 1994). One objective knowledge item pertained specifically to consumer awareness of the farmed or wild origin of the fish they buy.

The share of respondents answering correctly the five statements measuring objective knowledge is presented in Table 2. Slightly over three-quarters of the European consumers knew that fish is a source of omega-3 fatty acids (the highest awareness score), whereas only around 40% knew that fish is not a source of dietary fibre. These findings corroborate earlier findings from Verbeke *et al*. (2005) who reported that consumer's beliefs about nutritional facts from fish are rather poor and often wrong, despite considerable communication efforts. The fact that salmon is classified as a fatty fish was better known than cod's classification as a non-fatty fish.

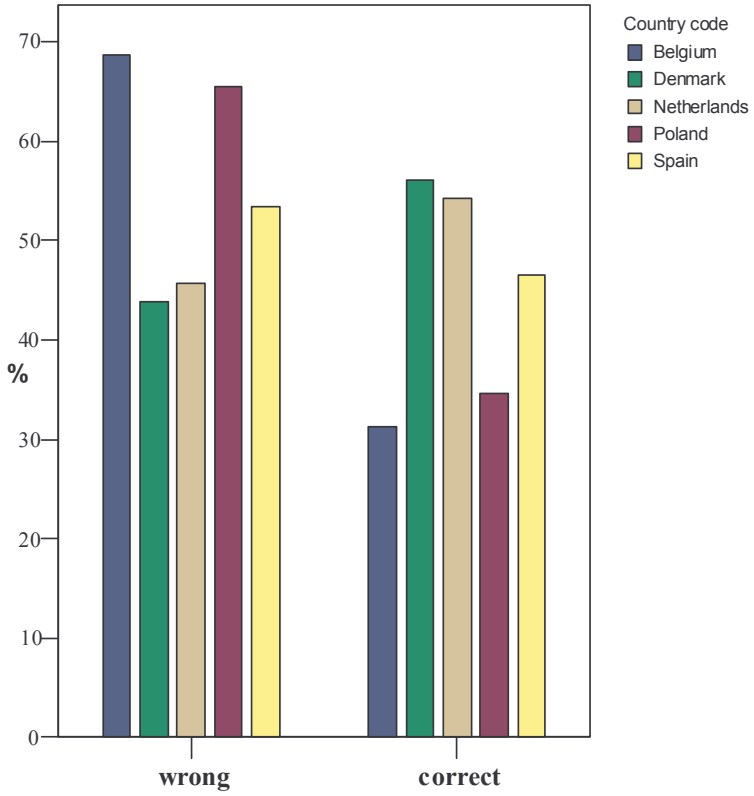
Consumers' knowledge was poorest with respect to the origin (farmed or wild) of the fish they purchase. From the total sample, only 44.8% of the respondents provided the correct answer that less than half of the fish consumers can buy is farmed fish. This was the second lowest "correct" response percentage of the knowledge measured and was at the same time provided with the highest degree of uncertainty, as compared to the other objective knowledge items in the questionnaire. Since guessing would have yielded a better result in terms of correct answers (50% probability of guessing correctly), it can be concluded that lack of awareness and/or misunderstanding about the farmed or wild origin of fish prevail among the European fish consumers. As shown in Figure 1, large differences between the countries were observed. Consumer awareness about the farmed or wild origin of fish is particularly low in Belgium and Poland, but somewhat better in the Netherlands and Denmark where a small gain of about 4-6%-points over the 50% correct-guessing hit rate is seen.

Table 2. Percentage of consumers responding correctly to objective knowledge statements

	Country					Total sample (n=4,786)
	Belgium (n=852)	Denmark (n=1,110)	Netherlands (n=809)	Poland (n=1,015)	Spain (n=1,000)	
More than half of the fish we can buy is farmed fish (correct answer is *No*)	31.3	56.1	54.3	34.6	46.6	44.8
Fish is a source of dietary fibre (correct answer is *No*)	33.5	59.8	28.6	33.9	40.4	40.3
Cod is a fatty fish (correct answer is *No*)	64.1	76.6	63.4	51.3	59.2	63.1
Fish is a source of omega-3 fatty acids (correct answer is *Yes*)	69.5	90.9	71.8	67.9	81.3	77.0
Salmon is a fatty fish (correct answer is *Yes*)	75.1	83.4	54.9	64.5	77.1	71.8

Source: SEAFOODplus consumer survey November 2004

Figure 1.Percentage correct ('no') and wrong response ('yes') to "More than half of the fish we buy is farmed fish" across five EU countries (n=4,786)



Source: SEAFOODplus consumer survey November 2004

4.2 Health and nutritional value

All respondents in the pan-European consumer survey were asked to evaluate first, fresh wild fish and second, fresh farmed fish, with regard to health, nutrition and safety among other things. A 7-point semantic differential scale was used to measure the different attitudes. Before scoring wild and farmed fish, participants were provided with the following explanations: "wild fish are fish that are captured in nature" and "farmed fish comes from aquaculture, which is breeding or rearing of fish under controlled conditions in captivity".

Consumers evaluated fish in general as a healthy and nutritious food product. From the total sample, 79.3% and 80.3% of the respondents evaluated wild fish as healthy and nutritious, respectively. Regarding fresh farmed fish, 71% and 74.3% of the respondents evaluated it as healthy and nutritious, respectively. About 20% expressed doubts whether fresh farmed fish is healthy / nutritious or unhealthy / not nutritious, as compared to only around 16% for wild fish. This resulted in a pan-European mean score of 5.76 on the 7-point scale for both wild fish healthiness and nutritional value, and in scores of 5.39 and 5.50 for farmed fish healthiness and nutritional value, respectively (Table 3). In conclusion, a lower agreement and somewhat higher doubt was expressed with respect to the healthiness and nutritional value of fresh farmed fish, as compared to fresh wild fish.

Comparing wild and farmed fish healthiness and nutritional value perceptions between countries reveals that Dutch respondents scored the lowest, overall. Danish consumers scored the highest for the healthiness and nutritional value perception of fresh wild fish, followed closely by Spanish consumers. In the case of fresh farmed fish, Polish respondents scored the highest as compared to the other nationalities (Table 3). It should also be noted that the differences in perception between wild and farmed fish within a country are higher for healthiness than for nutritional value. Belgian and Polish consumer perceptions hardly differed on the nutritional value of wild versus farmed fish.

Table 3: Consumers' perception towards wild and farmed fish healthiness and nutritional value; pan-European mean and comparison between the countries (n=4,786)

	% scoring >4 on 7-point scale*					Pan-European mean (S.D.)**
	Belgium	Denmark	Netherlands	Poland	Spain	
Fresh wild fish – unhealthy / healthy	71.9	88.0	64.9	81.0	85.7	5.76 (1.40)
Fresh farmed fish – unhealthy / healthy	65.1	75.8	57.4	78.1	72.9	5.39 (1.41)
Fresh wild fish – not nutritious / nutritious	73.1	90.9	62.2	81.3	88.7	5.76 (1.32)
Fresh farmed fish – not nutritious / nutritious	71.8	80.1	57.4	81.1	77.6	5.50 (1.35)

** scoring >4 means scoring on the positive side of the semantic differential, i.e. 'healthy' or 'nutritious'*
*** mean and standard deviation on 7-point scale (n=4,786)*
Source: SEAFOODplus consumer survey November 2004

4.3 Safety

From the total sample, the majority (63%) of the respondents evaluated wild fish as safe, 26.9% were undecided, and 10.1% claimed that wild fish is unsafe. Regarding fresh farmed fish, 64.2% of the respondents evaluated it as safe, 27.0% reported the midpoint of the scale (neither unsafe nor safe), and the remaining 8.8% of the participants evaluated farmed fish as unsafe. Also, the pan-European mean scores for safety perception indicate that the participants in general perceived the safety of fresh wild and fresh farmed fish in a very similar way (Table 4).

Table 4.Consumers' perception towards wild and farmed fish safety; pan-European mean and comparison between the countries (n=4,786)

	% scoring >4 on 7-point scale*					Pan-European mean (S.D.)**
	Belgium	Denmark	Netherlands	Poland	Spain	
Fresh wild fish – unsafe / safe	49.6	70.4	42.3	66.6	79.2	5.14 (1.50)
Fresh farmed fish – unsafe / safe	61.3	64.8	50.7	70.3	70.9	5.18 (1.45)

** scoring >4 means scoring on the positive side of the semantic differential, i.e. 'safe'*
*** mean and standard deviation on 7-point scale (n=4,786)*
Source: SEAFOODplus consumer survey November 2004

Nevertheless, considerable between-country differences were detected. It was found that Dutch respondents scored the lowest with regard to fish safety perception, which indicates that they have the highest risk perception. On the other hand, Spanish and Polish consumers scored the highest for perception of fish safety in general, and fresh farmed fish in particular. Additionally, Spanish respondents – followed by Danes – showed the strongest perception of fresh wild fish as being safe. Note also that fresh farmed fish is much more perceived as safe than wild fish in Belgium, while slightly more in the Netherlands and Poland. On the contrary, wild fish is perceived as safer than farmed fish in Spain and Denmark (Table 4).

4.4 Ethical issues

Respondents were also asked to evaluate fresh wild fish and fresh farmed fish with regard to ethical issues related to seafood production. Again, a 7-point differential scale ranging from "unethical" (1) to "ethical" (7) was used. With regard to fresh wild fish, 57.6% of the respondents evaluated wild fish as ethical. One third of the respondents (35.4%) classified fresh wild fish as neither ethical nor unethical. Regarding fresh farmed fish, 51.4% of the respondents evaluated it as ethical. Even more of the respondents held a neutral opinion about ethical issues of fresh farmed fish (37.3%). Generally, the respondents from all five countries perceived eating fish as rather ethically correct, which is reflected in the pan-European mean scores slightly above the mid-point (score 4) of the scale (Table 5). However, this overall mean score is higher for wild than for farmed fish.

As with health, nutritional value and safety, many differences between the countries were found. Specifically, it was found that Dutch respondents scored the lowest with respect to the perception of fish ethical issues. Most remarkably, only one third of the Dutch scored on the ethical side of the semantic differential scale for farmed fish. On the contrary, Spanish consumers scored the highest for the ethical perception of fish in general, and fresh farmed fish in particular. Whereas the perceptual difference between wild and farmed fish ethics within Belgium, Poland, Spain and the Netherlands is rather low, Danes display a strongly different perception for wild versus farmed fish ethics. More than two thirds of the Danish

consumers indicated that wild fish is ethical, while less than half of them agreed that farmed fish is ethical (Table 5).

Table 5. Consumers' perception towards wild and farmed fish as being ethical; pan-European mean and comparison between the countries (n=4,786)

	% scoring >4 on 7-point scale*					Pan-European mean (S.D.)**
	Belgium	Denmark	Netherlands	Poland	Spain	
Fresh wild fish – unethical / ethical	50.5	66.7	40.8	59.4	65.3	5.13 (1.50)
Fresh farmed fish – unethical / ethical	51.0	46.8	35.3	61.9	62.2	4.86 (1.54)

** scoring >4 means scoring on the positive side of the semantic differential, i.e. 'ethical'*
*** mean and standard deviation on 7-point scale (n=4,786)*
Source: SEAFOODplus consumer survey November 2004

4.5 Fish consumption behaviour

Fish consumption behaviour was measured as the frequency of fish consumption at home, out of home, for different fish species and types of fish. Although the survey was designed to include only fish consumers, about 2.5% of the total sample of 4,786 Europeans reported eating fish never or seldom. . The average fish consumption across the five countries was 1.2 times per week at home, while the consumption of fish out of home was about once a month. Spain had by far the highest fish consumption with an average total fish consumption frequency of about 2.5 times a week, almost twice as often as Denmark, which had the second highest consumption. Fish consumption frequency in Poland, Belgium and The Netherlands was down to once a week on average (Honkanen and Brunsø, 2005).

When asked specifically about their consumption frequency of farmed and wild fish, about one third of the sample indicated never eating farmed fish (33.5%) and wild fish (34.5%), respectively. Most remarkably, nearly one quarter (24.8%) of the respondents indicated eating neither farmed nor wild fish. This share contrasts greatly (ten-fold) with the 2.5% who claimed to eat fish (in general) never or seldom. The obvious conclusion is that, when confronted with the question about the origin of the fish they buy and eat, a lot of fish consumers do not feel at ease, and appear unable to provide a reliable response. Most likely, this results from a lack of interest, awareness or product origin knowledge.

5. Conclusions

European consumers' perceptions about farmed and wild fish are quite diverse, and often contrast with the current scientific consensus about equal healthiness and nutritional value qualities (EFSA, 2005), and with the undecided position about differences in the safety and ethical qualities of farmed versus wild fish. Although fish in general is perceived as a healthy, nutritious, safe and ethical food, numerous differences between the perceptions of

farmed *versus* wild fish emerged. Empirical data from the reported studies indicates that consumer awareness and knowledge about the farmed or wild origin of the fish they purchase is rather poor, particularly among light fish user groups. However, most importantly, the pan-European SEAFOODplus consumer survey reveals considerable cross-country differences in knowledge and perception about farmed versus wild fish, which limits generalisation over the European fish consumer population.

The available empirical data from three different studies in Belgium consistently reveal that Belgian consumers perceive wild fish as healthier and more nutritious than farmed fish. This view was shared by the consumers in each of the other European countries in the study, particularly so by consumers from Denmark and Spain – the countries with the highest fish consumption frequency in the study – where the difference in the perception of farmed versus wild fish on health and nutritional value is the most explicit. The focus group discussions revealed that the perceived more 'natural' image of wild fish may account for the differences in healthiness and nutritional value perception.

With respect to fish safety perception, a more diversified cross-national picture is obtained. First of all, whereas Belgians were undecided about differences in safety between farmed and wild fish in March 2003, they turned out to perceive the safety of farmed fish substantially better than of wild fish in the SEAFOODplus consumer survey of November 2004. Together with the Dutch consumers, Belgians appear to express some doubts about the safety of farmed fish. In contrast, Spanish and Danish consumers are quite strongly convinced about farmed fish safety, though without expressing doubts over wild fish safety. Given this pan-European diversity, it can be concluded that consumer perception corroborates the undecided and multifactor dependency state of scientific evidence about farmed versus wild fish safety.

Finally, with respect to ethical issues, the Dutch consumers in particular seem to be quite critical in general. However, European consumers hardly differentiate between farmed and wild fish ethics. A notable exception pertains to the Danes, who share a quite favourable perception of wild fish on ethical issues *versus* a rather unfavourable perception of farmed fish.

The findings from these studies illustrate that – despite their rather poor awareness of fish origin and poor knowledge about fish farming – European consumers hold quite specific though differentiated opinions about the healthiness, nutritional value, safety and ethical issues of wild *versus* farmed fish. These opinions or perceptions are driven more by emotions than by rational factors, such as product or process knowledge, particularly among consumers with lower degrees of fish involvement, experience and consumption frequency. Negative image transfer from other livestock production sectors seems to weigh to some extent on farmed fish perceptions, while the perceived naturalness of wild fish determines its favourable image.

This study aimed at contributing to a better understanding of farmed *versus* wild fish perception among consumers. It provides insights in the existing gaps between scientific evidence and consumer perceptions about farmed and wild fish. These gaps differ between different consumer segments, as illustrated in this case with cross-national comparisons. Further analyses will reveal the role of other segmentation criteria such as general attitudes, involvement, or socio-demographics, as well the potential impact of segmented information provision in bridging the gap between scientific reality and consumer perception of farmed and wild fish. Such insights should finally contribute to the development and

implementation of well-targeted, cost-efficient and effective communication strategies aiming at improving the health and well-being of European citizens and fish consumers.

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