

Consumers' attitude towards fish meat

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Abstract

The overall aim of this paper is to show the factors that may affect consumers' attitude towards farmed fish products. Consumers ask new products on the basis of different quality attributes: stability, safety, composition, better health effects, environment protection, *etc.* Different and controversial opinions on farmed and wild fish are also explored by literature review. The authors pay attention also to fish welfare as an emerging issue and effective information about fish products as a factor exerting a positive influence on consumers' decision of purchase. Some relevant legislative notes on the paper's topics are also cited. The qualitative aspects of aquaculture fish and the consumers' demand and choice need further studies, according to some factors, such as the changing consumers' attitudes towards fish products, the different fish quality perception and the development in the aquaculture systems.

Introduction

To date, trend in consumers' choice of food is a more complex matter than in the past; the idea about the choice of food is more dynamic and diversified. A growing consumers' interest in safe food, as other crucial factors, can affect food acceptance and choice. Cultural differences can also influence the preferences for food; for example food taste differs across countries. Furthermore, demand for healthy food, convenience, versatility, cheapness, quality and quantity are perceived by different people in many different ways. In some countries, people put a low emphasis on products' quality. Some other consumers consider food as responsible for good health; in this case traditional food plays a decisive role. Also, other consumers pay attention to technological innovation in the food field which can be considered as a rational approach to the food choice (Grunert *et al.*, 2001). If consumers were able to comple-

tely understand food characteristics, the introduction of new products in the market would be improved. In this context, the need for information on food composition has grown (Brunso *et al.*, 2002).

On the basis of the aforementioned considerations, the overall aim of this paper is to explore consumers' attitudes towards farmed fish. The paper synthetically analyses some of the most important factors that may influence farmed fish choice and purchase by consumers; furthermore, consumers' attitudes for farmed and wild fish are also reported.

Overview of consumers' attitudes worldwide

Some developing countries mostly consider a future increase in food demand and consumption in view of the population increase. Seafood industry will evolve as a consequence of specific consumer demands, both in developing and developed countries. Many retailers, particularly in Western Europe, have conceived private labels for fish, aiming to a better food products qualification than in the past. During the 1990s, retail sale of processed food products grew rapidly in Eastern Europe. At the same time, consumers have become increasingly conscious of their needs and they frequently ask for healthy and cheap products. In Latin America, similarly to Eastern Europe, wealthy people prefer timesaving products and food having high healthy attributes, high quality and variety. Latin America, some developing countries and Asia are undergoing changes, similarly to Eastern Europe (Regmi and Gehlhar, 2005). British consumers are concerned for bovine spongiform encephalopathy and for hormones and antibiotics use in farms and biotechnological applications are not always accepted in food production (Spencer, 2001). On the contrary, in the USA, these aspects are a concern only for a few people; furthermore food quality, price and the ability to supply a needed food volume have a low significance (Skytte and Blunch, 2001). Consumers' idea about food quality is complex, indeterminate and uncertain and it is sometimes not congruent.

The acceptability of cultured fish

Fish meat is perceived as a healthy food and as an alternative to other meat, such as red meat, as a source of proteins. Overall, consumer's decision process when purchasing seafood involves some variables; generally, people take into account high biological value proteins, vitamins and some minerals content and low content of saturated fat. On the other hand, consumers have also the consciousness of some safety risks, *e.g.* potential adverse effects of fish contaminants on health. Fishery products are considered one of the main sources of human exposure to pollutants such as

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polychlorinated biphenyls, dioxins, organochlorines pesticides, some heavy metals and other environmental toxic substances. However, some differences exist among regions and such risk assessment must be performed locally.

Fish consumers' choice and behaviour towards cultured fish

Farmed fishes received a considerable attention during the past two decades as an alternative to wild sea fishes. Aquaculture system allowed people to appreciate fish as food, and this system has contributed to preserve some endangered aquatic species. At the same time, the development of fish farming industry raised some concerns about welfare in the aquaculture system. For some consumers' segments this issue has become increasingly significant, with a particular attention to the health and well-being of farmed fishes, especially for proper farms planning and management (Schwedler and Johnson, 1999/2000) that should prevent unnecessary pain or should reduce it to a minimum level; in this way the implementation of welfare practices would represent a paramount tool helping consumers' decisions for fish choice and consumption. In this context, it must be underlined that the Treaty of the Functioning of the European Union (the Treaty), that recognises animals as sentient beings, including fish; hence all scientifically known animals to be able to feel pain are included in the scope of EU animals welfare policy imposing an obligation to ensure that their welfare needs are considered within the framework of EU policies (European Commission, 2009).

However, fish welfare has become an emerging area for research; the aspects relating to fish welfare have been rationally recognised and thus human concept about fish well-being will be easier addressed (Volpato, 2009). Honkanen and Olsen (2009) carried out a survey in Valencia, Spain, among 450 randomly-chosen respondents, using a questionnaire, to investigate consumers' concern for environmental and animal and fish welfare issues. Farmed fish welfare did not seem to be important for the respondents; however, some differences among the consumers relating to general environmental and animal welfare concern and ambivalence were found. Three consumers' segments are identified: the unconcerned (27%), the wild fish concerned (34.5%) and the ambivalent (38.5%). The findings indicated that the animal welfare issue has not yet become a barrier for farmed fish in Valencia. In the authors' opinion the results may help fish-farming companies to find their target group among the consumers, based on environmental and animal welfare issues. Furthermore, for the ambivalent group, more information and knowledge can change their attitudes so they become more positive toward farmed fish in the future (Honkanen and Olsen, 2009). Further topics are strictly related to fish wellness, *e.g.* sustainability and ethics. These issues can also influence consumer's decision towards fish consumption, although Verbeke *et al.* (2007) report that a lack of knowledge about this matter still exists.

Fish behavioural patterns seem to be not so consistent to promote consumers' interests, preferences or attitudes. In fact, the most important criteria for fish purchasing are taste, price, quality, convenience and brand knowledge: a minority of consumers take into account sustainability or ethical features. Quality expectations, choice and purchasing decisions would be influenced by consumers' awareness or lack of knowledge about origin, sustainability and ethical issues in fish farming. Today low levels of availability and limited marketing of ethical fish products exist and products are seldom suitably displayed in the shops (Verbeke *et al.*, 2007).

Farmed and wild fish

Some experiences on controversial consumers' opinions about cultured fish and wild sea products are reported below.

A study on different consumers' behaviour was carried out by a postal self administered survey from a sample of Flemish women, ranging in age from 20 to 50 years. Consumers expressed higher interest for environmental issues than for fishes welfare when buying these food products, meaning a high concern about a healthy world (in favour of their own health). The analyses also indicated a clear interest and concern in sustainability issues

relating to aquaculture and fisheries, while consumers' knowledge appeared rather limited. Ten percent of the respondents declared to refuse farmed fish; on the other hand, a similar percentage refused wild fish. The latter consumers gave more importance to fish welfare and sustainability and they were more convinced that aquaculture contributes to natural fish stock conservation. Hence, rejecting wild fish is associated with attaching importance to sustainability and fish welfare.

Some people perceived that fish have a low effectiveness. The information about fish origin have a certain influence on consumers' preference for wild fish and on farmed fish avoidance; in this case consumers' choice was not imputable to the ethical issues. In fact, these consumers had no perception on sustainability and ethics for farmed fish (or they gave low importance to these aspects); they expressed interest for the intrinsic quality attributes (*i.e.* nutritional value, healthiness and probably also taste). These findings also confirmed the need for an effective information about sustainability and ethical issues for both wild and farmed fish. Consumers had a strong interest for information; people refusing wild fish prospecting a direct benefit from a proper information. An appropriate communication is necessary when farmed fishes are refused, because this behavior can be related to consumers' beliefs that disagree on some scientific evidences (Vanhonacker and Verbeke, 2006).

A further study compared consumers' opinions about farmed and wild fish. The majority of Belgian consumer sample showed no perceived differences between farmed *vs* wild fish. However, mean perception scores were slightly in favour of wild fish on the basis of some attributes such as taste, health and nutritious value, in particular among aged consumers. Farmed fish were considered to be more available than wild fish, while fish safety perceptions did not differ between farmed and wild fish. The focus group discussions showed that consumers' opinions and beliefs about farmed fish were mainly based on emotions and images deriving from intensive terrestrial livestock production rather than from awareness and factual information and knowledge on aquaculture topics (Verbeke *et al.*, 2007).

A survey on customer purchase attitudes, especially towards farm-raised fish, was carried out in Italy; in this case 300 buyers in traditional shops in Milan (fish shop, street, and local market) were considered. A hierarchical clustering analysis has been applied; a questionnaire was administered to consumers and it was divided into different sections; one of these sections has taken into account perception of farm-raised and wild-caught fish analysing consumers' evaluation of fish attributes related to the products purchase. Interviewed

people preferred large amounts of farmed fish, coupled with a preference also for wild caught products. These people were included into two groups; a group opposed to farm-raised was composed of two clusters: the first represented the hedonic consumer and the second group represented the old-generation consumer. The price-forced consumers preferred wild-caught product; instead they purchased farm-raised fishes because these products had a low price. They were probably not totally satisfied with their choice. Consequently, food operators should reduce the gap between two different products, pointing at the intrinsic quality of farm-raised products. A second consumers' cluster included trend-influenced people, that preferred a wild-caught product and demonstrated a certain attention to the seller's suggestion. In the authors' opinion this situation indicated a certain inclination to a new type of hedonic consumption, simultaneously linked to traditional customs and market issue evolution. These consumers can be attracted by a *novelty* deriving from farm-raised fish, such as the ecological potential, which really is a major strength. A further cluster referred to the new typical consumer, the market-attentive ones, who can distinguish between different goods, showing the ability to recognise different prices for each product. This behaviour could imply that Italian producers restate the information profile for fishery products, aiming to strengthen the relationship with consumers (Gaviglio and Demartini, 2009).

Rajani (2010) analysed the intention to consume wild fish *vs* farmed fish in Vietnam's South Central Coast. The respondents and participants were selected on the basis of their main responsibility for buying and preparing foods and seafood in their households. The author found that consumers had preferred wild fish after 3 days following purchase than farmed fish. Furthermore, other issues have been showed. Some variables, as norms, price, availability and knowledge, can influence the choice of wild fish products because they are more fresh, nutritious, natural and available than farmed fish. Respondents had the willingness to stop buying the products from companies that are guilty of pollution. Consumers' interest in healthy environment means that the attention towards production methods can lead to buy a specific type of fish. Furthermore, aquaculture systems have more disadvantages for the environment: aquaculture can cause an overexploitation of fish stocks. Fish farming would have a negative environmental impact; this aspect confirmed the positive attitude towards wild fish consumption. Consumers showed their lack of knowledge about ethical problems but they were worried about pain, fear and stress during wild fishes harvesting. Nevertheless, consumers did not consider farmed fish as animals and fish welfare had also

a negligible impact on consuming wild or farmed fish. Moreover, fish consumption frequency in Vietnam results higher than in many European countries (e.g. Spain, Belgium). In the author's opinion consumers need a better information about farmed and wild fish, to get better responses on their issues (Rajani, 2010).

Consumers' perception of fish quality, information and labeling

Food labelling is an effective instrument for consumers' information. In such a way an increased consumers' awareness and trust towards fish, together with information on the label, can have a certain impact on food choice.

Pieniak and Verbeke (2008) reported some observations about consumers' opinion in five European countries. The aim was to evaluate the following issues: compulsory food labelling and consumers' demand for potential indications on fish labels, packages or shelves. The results showed that additional information was of interest for European consumers. In all countries labelling was considered as an essential guarantee for safe fish; consumers' interest for quality marks was also showed. When people put their trust in fish label they pay attention on traceability information. Respondents had information on fish species name and weight and on expiry date and price; in this way they felt able to obtain a clear assurance on fish quality. For fishery products, consumers correlated information to product safety and quality mark; consumers put their trust in information when the mark is supported both by plausible controls and guarantees deriving from a good traceability system (Pieniak and Verbeke, 2008; Verbeke *et al.*, 2007).

Council Regulation (EC) No 104/2000 on the common organisation of the markets in fishery and aquaculture products stated that fish must be labelled according the production method (wild sea or farmed fish). This compulsory rule can help those consumers wishing to avoid intensively farmed fish (European Commission, 2000). Labelling and traceability can be considered two of the most important means to safeguard consumers' security; these attributes will help people to differentiate and choose food products.

A further field of interest is represented by a particular condition of use of the customers' information, that is the eco-labeling. An experimental report on this topic shows some important issues. The study on food labeling analysed consumer preferences for seafood labels that include the information about environmental production attributes. The survey evaluated some factors that may influence consumers' acceptance of an eco-labelling programme for seafood products. The results of a parallel research on consumer preference, both in Norway and USA, were compared; the

aim was to evaluate potential differences in consumers' acceptance of seafood eco-labels in different countries. The following primary issues were assessed: i) consumers preferences for eco-labeled seafood, ii) factors influencing the choice of eco-labeled seafood, and iii) differences across countries and impacts of eco-labeling on consumers. A contingent-choice telephone survey of random households was applied. The contingent-choice model highlighted a need for a thorough analyses of consumer preferences for eco-labeled seafood, particularly given that seafood eco-labels must compete with other valued attributes, such as fish-safety, quality, price, brand, *etc.* Model results also emphasised the significance of cultural and other differences across nations; substantial divergence exist between Norway and the United States on the impact of a wide range of variables. The survey provided direct insights; despite this, in the author's opinion, the research has had some important limitations, such as: i) the lack of a large-scale market for eco-labeled seafood needs a stated-preference approach, which may result in upwardly biased estimates in the consumers' willingness to purchase eco-labeled products or in the probability to choose such products at any given premium; ii) the model does not address the impact of labels on consumers' choices among different seafood species, or among seafood and other food products. These limitations may be addressed by future research; the latter may provide additional information to design some international seafood eco-labeling programmes.

The Italian and Czech projects and fish consumption

A report from the Italian Institute of Services for Agricultural and Food Market (ISMEA) showed that the preferences of Italian consumers are directed to fresh fish, wild fish and aquaculture products. ISMEA, by a specific project, evaluated the trends towards fish consumption in Italy, with a particular reference to the factors that may influence consumers' choice, such as: i) consumers' preferences, behaviours and perceptions; ii) consumers' expectations on the information effectiveness about fish food; iii) consumers' knowledge of rules in fish label. A specific administered survey was carried out in the context of this project. Interviewed people clearly declared a higher preference for fresh seafood, preferably from Italian seas, than for frozen, deep-frozen and thawed fishes. Furthermore, Italian consumers were inclined to eat wild fish but products' price was the main hindrance for purchasing. Simultaneously both emotional and rational factors can coexist. When emotional factors prevailed, wild fresh fish had a particular *appeal* and the purchase became gratifying; on the other hand, some rational factors,

influencing consumers' choice, induced to buy aquaculture fish, frozen and deep frozen products. At first, consumers thought that fish from aquaculture systems can ensure a better health security than wild fish, because the latter can be subject to sea pollution to a greater degree than farmed fish. Conversely, deep-frozen fish products were considered more safe and practical, with a good content of service. In the internal geographical areas fish food were purchased more in a large-scale distribution than in other commercial sites; in fact, in large-scale distribution consumers can find suitable hygienic and safety requirements. In the coastal cities, respondents purchased at the local market because they had a friendly tie with retailers. Furthermore, consumers thought that fish price, origin, species and physical status (fresh or thawed) should be clearly reported during the labelling process, allowing an adequate information (ISMEA, 2011).

In 2008, the Czech Ministry of Agriculture started a project to encourage Czechs to eat more fish all year round. Unfortunately, Czechs produce thousands of tons of carp and other freshwater fish but most of them are exported to other countries. The project should bring more awareness to home-grown fish that should be consumed all year round and not just at Christmas (Vorlík, 2008). As a result, freshwater fish consumption grew by 0.14 kg per person from 2008 to 2011. The project has not finished yet, the campaign will continue until 2015 (RAP, 2013). Only a few years ago to Czechs *fish* meant traditional carp dishes served at Christmas. However, seafood is now readily available with new supermarkets offering a wide variety of fresh and frozen fish and seafood. Consumers are looking for convenience and healthy processed food including fish, there is a shift in demand from whole fish to prepared fish – boneless, skinless fillets, steaks, portions, *etc.* The ratio between fresh and frozen fish is improving towards higher percentage of fresh; in 2006 it was 40% of fresh and live fish and over 60% of frozen fish and seafood. There is a shift from low cost fish fillets, often breaded, towards better quality higher price natural fish fillets (salmon, pangasius, *etc.*). Both fresh and frozen fish are available all year round. Traditional fish consumption consists of carp at Christmas, while smoked or dried fish products are bought for home consumption and trout offered all year round on the menu of most Czech restaurants. In the past several years, consumption of more expensive fish (salmon, halibut, shrimp, lobster, scallops, sea-bream, *etc.*) has increased (bought fresh, frozen or alive) (USDA, 2007).

Discussion

Food quality is a considerable aspect for human life; people become more and more concerned about nutrition, food safety and environmental issues as crucial issues for food products' acceptance. Some changes in food choice are linked to the quality perception of food product and this concept has become more dynamic. Sensory and health attributes, convenience and process' characteristics are the major dimension for food quality. Consumers' preferences and attitudes are very important: people with a positive trend towards fish choose and eat more fish and try to maximise the quality while keeping a low food price. The preference for wild sea fish *vs* wild farmed fish can be explained by some factors such as perceived quality, sensory properties, nutritional value, healthiness, safety, price, environmental and ethical concerns. Food choice, when influenced by environmental factors and animal welfare, according to scientific evidence, is based on ecological reasons.

Conclusions

Future research needs additional information on cultural, social, demographical factors and on consumers diversification. These elements exert constant influence on consumers' perception of food quality (Rajani, 2010).

References

- Brunso K, Ahle Fjord T, Grunert KG, 2002. Consumers' food choice and quality perception. The Aarhus School of Business Publ., Aarhus, Denmark.
- European Commission, 2000. Council Regulation of 17 December 1999 on the common organisation of the markets on fishery and aquaculture products, 104/2000/CE. In: Official Journal, L17/22, 21/1/2000.
- European Commission, 2009. Building a sustainable future for aquaculture. A new impetus for the strategy for the sustainable development of European aquaculture. Available from: http://europa.eu/legislation_summaries/maritime_affairs_and_fisheries/fisheries_resources_and_environment/pe0007_en.htm
- Gaviglio A, Demartini E, 2009. Consumer attitudes towards farm-raised and wild-caught fish: variables of product perception. *New Medit* 8:34-40.
- Grunert KG, Brunso K, Bredahl L, Bech AC, 2001. Food-related lifestyle: a segmentation approach to European food consumers. In: Frewer LJ, Risvik E, Schifferstein HNJ, von Alvensleben R, eds. *Food, people and society: a European perspective of consumers' food choices*. Springer Verlag, London, UK, pp 211-30.
- Honkanen P, Olsen SO, 2009. Environmental and animal welfare issues in food choice: the case of farmed fish. *Brit Food J* 111:293-309.
- ISMEA, 2011. Il pesce a tavola: percezioni e stili di consumo degli italiani. Preferenze e comportamento del consumatore, grado di informazione e conoscenza della normativa sull'etichettatura attraverso la tecnica dei focus group. *Il Pesce* 4:58.
- Pieniak Z, Verbeke W, 2008. Consumer interest and marketing potential of information on fish labels. In: Proc. of the 12th Int. Congr. of the European Association of Agricultural Economists, EAAE, Ghent, Belgium.
- RAP, 2013. Ministerstvo zemědělství spustí Rybu domácí 2. Available from: <http://zpravy.e15.cz/domaci/ekonomika/ministerstvo-zemedelstvi-spusti-rybu-domaci-2-988405>
- Rajani N, 2010. Values, attitudes and intention to consume wild fish versus farmed fish in Nha Trang. MA Thesis. The Norwegian College of Fishery Science, University of Tromso and Nha Trang University Publ., Norway and Vietnam.
- Regmi A, Gehlhar M, 2005. New directions in global food markets. United States Department of Agriculture Publ., Washington, DC, USA.
- Schwedler TE, Johnson SK, 1999/2000. Animal welfare issues responsible care and health maintenance of fish in commercial aquaculture. *AWIC Bulletin* 10:3-4.
- Skytte H, Blunch NJ, 2001. Food retailers' buying behavior: an analysis in 16 European countries. *J on Chain Network Sci* 1:133-45.
- Spencer H, 2001. Food safety and the European consumer. In: Proc. of 71st EAAE Seminar - The food consumer in the early 21st century, Zaragoza, Spain.
- USDA, 2007. Czech republic fishery products fish and seafood market brief. Available from: www.fas.usda.gov/gainfiles/200704/146280917.pdf
- Vanhonacker F, Verbeke W, 2006. Ethics and the politics of food. In: Kaiser M, Lien ME, eds. *Consumer perception about ethical and sustainability issues of fish*. Wageningen Academic Publ., Wageningen, The Netherlands, pp 464-9.
- Verbeke W, Sioen I, Brunso K, De Henauw S, Van Camp J, 2007. Consumer perception versus scientific evidence of farmed and wild fish: exploratory insights from Belgium. *Aquacult Int* 15:121-36.
- Volpato GL, 2009. Challenges in assessing fish welfare. *ILAR J* 50:329-37.
- Vorlíček P, 2008. Ryba je dobrá, zdravá a domácí. Available from: http://eagri.cz/public/web/mze/tiskovy-servis/tiskove-zpravy/x2008_tz-080821-ryba-je-dobra-zdrava-a-domaci.html