Consumer attitudes towards farm-raised and wild-caught fish: variables of product perception*

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Jel classification: C420, Q220

Abstract

Global and national fish sector trends require Italian operators to implement new marketing strategies for their production to evade foreign competition and exploit the Italian agro-food system synergies. This survey analyses customer purchase attitudes, especially towards farm-raised fish through a hierarchical clustering analysis performed on 300 buyers in traditional shops in Milan. The perception of the product seems to be tied to traditional customs. However, it is indicated that contemporary customers have the capacity to understand differences between fish products, consequently allowing for new communication approaches. In particular, wild-caught fish, purchased by hedonic and old customers, can be displayed through new labels stating the product origin, in order to merge sensory and cultural-empathetic consumption together. The fish farmers' challenge is to enhance consumer loyalty to their product, through general communication campaigns related to the farm-raised fishes' intrinsic and environmental properties to fill the gap between producers' and buyers' knowledge.

Key words: consumer, quality, fish products.

Résumé

A la lumière des tendances nationales et globales du secteur de la pêche, les opérateurs italiens doivent élaborer de nouvelles stratégies de production pour faire face à la concurrence internationale et exploiter les synergies du système agro-alimentaire italien. Cet article analyse les attitudes des consommateurs en termes d'achats surtout de poisson élevé à travers une analyse hiérarchique sur 300 acheteurs dans des magasins traditionnels à Milan. La perception du produit est lié aux habitudes traditionnelles. Cependant, les consommateurs modernes sont capables de distinguer entre les différents produits. Voilà pourquoi il faut lancer des campagnes de communication liées aux propriétés intrinsèques et environnementales des poissons élevés.

***Mots clé**: consommateurs, qualité, poisson*

Introduction

The fish sector is changing radically at this time. Fuel and food price increase and wild-fishery resource contraction are only a few of the factors that enabled aquaculture to raise fishery consumption quantity. This fact–probably "a milestone," as Nomura affirms in the 2009 FAO annual report–underlines the relevance of studies that contribute to an understanding of the evolution in customers' behaviour, in order to gain information to improve sector competitiveness. Consumer knowledge represents the ground for operators to develop appropriate marketing strategies for their products and policymakers to design intervention plans for fishery operators who are confronted with these progressive changes. At the same time, potential new agents need to acquire information about consumer perception, so as to create a business that can withstand the difficulties that the sector is facing.

The aim of this survey is therefore to segment the market demand for fish to describe the main customer purchase behaviours and suggest new strategies for wild-caught and farm-raised fish production. The analysis, conducted on consumers purchasing at traditional retailers, concerns the attitude towards farm-raised fish[1]. To offer a full understanding of the issue, the following paragraphs contain a description of fish markets, focusing on farm-raised and wild-caught production. Following these descriptions, the methodology and results obtained by hierarchical clustering are presented.

The analysis shows a modern consumer generally willing to purchase farm-raised species. Consequently, it has been possible to describe different behaviours; some customers prefer farm-raised fish simply for its cost, others maintain their preference for caught fish. People more attentive to market (and probably social) trends link fish consumption to a hedonic experience, which includes "traditional" attitudes, such as the confidence in the shop owner and/or the "new" ecological attention to aquaculture sustainability. The largest cluster, more difficult to depict, includes young families with different attitudes and varying degrees of fish knowledge, which seems to indicate the most profitable customer group to design marketing strategies for.

1. Fish market: from global scenery to Italian trends

The FAO (2009) announced that human fish consumption has been steadily growing in the last four decades, rising from 9.9 kg pro capita in the 1960s to an average of 16.4 kg in

* This paper is the result of collaboration between all Authors. The actual writing of section 2, 3.2, 3.3 and 3.4 to Anna Gaviglio; sections 1 and 3.1 is attributable tu Eugenio Demartini; Introduction and Conclusions to both Authors.

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[1] The survey follows a similar work analyzing modern distribution retail channel and the changing disposition from purchasing endangered wild species to not-endangered/unknown wild species (Gaviglio and Pirani, 2009).

2005. Coupled with unfavourable conditions for fishery activity, the increasing demand for fish products lead to the growth in fishery operators, with a positive expansion of fish farmers and a less pronounced rise of world fishers. Looking at fisheries production, the trend is stressed until a decrease of inland and marine capture is noted, with farm-raised product volume increasing to about 11.3 million t in 5 years, equal to a supply expansion of 28.22% compared with that in 2002 (Table 1). The international scenery is changing rapidly, with some countries, such as China and Thailand, increasing their activities; whereas others, like Peru, are losing their market shares (FAO, 2009). Under these conditions, the 27-member European Union produced in 2006 almost 6.9 million t, which permitted it to maintain the third position in international ranking. The sector evolution is in line with international tendencies; with volume of caught fish contracting and that of farm-raised fish increasing, the whole result is negative, with a 1.1% loss of European fish production (ISMEA, 2008).

Considering Italy, the ISMEA Agro-Food Outlook shows a difficult time for its fishery sector. In 2007, captures provided about 277,000 t (-7.4% compared with previous year), while aquaculture provided 247,000 t (+2.2% compared with previous year), accounting for an overall loss of 3.1% of supply volume. The data are even more significant, given the fall in revenue of 6.0% in the last year; the loss is completely due to the captures sector, which seems to have particularly suffered from the current economic situation. Meanwhile, aquaculture is able to withstand the economic pressure: the growth in volume is accompanied by a more than proportional increase in the value of production. As a natural consequence of consumers' increasing attention to health, indeed, Italian fish consumption is constantly growing. The high domestic demand is met through cheaper farm-raised products, often imported from foreign countries. Consequently, Italy is fifth in the global ranking of countries importing fish (ISMEA, 2008).

The Italian fish sector needs to adapt to actual and future trends in the global market. At this time, consumers can choose from many farm-raised species from all over the world. Neither common nor negional policies can continually support national fishery and aquaculture business. The operators' challenge, in order to survive under these economic conditions, is becoming more difficult as new foreign countries offer good products at low prices. To face the crisis, the sector must understand new market prospects, analyse customer trends to predict future demand, and build adequate marketing strategies.

2. Methodology

Using a questionnaire, a survey was conducted among 300 consumers purchasing fish at three different types of traditional retailers in the town of Milan (fish shop, street, and local market). Data collection was conducted through face-to-face interviews, which gathered information effectively as the number of incomplete questionnaires is minimised.

The questionnaire (pre-tested on a small group of consumers[2]) consists of 18 questions divided into 4 sections, chosen on the basis of a literature review. Below we describe the main issues, which correspond to the sections of the questionnaire:

1. Interviewee profile: the first section includes questions concerning the main socioeconomic characteristics of the sample respondents. As recommended by Gunter and Furnham (1992), general demographic variables were included in the questionnaire. Customers were asked about their age, gender, educational qualifications, and number of family members. It also asked consumers to indicate the average amount spent on fish products and the frequency of buying them–representing product-specific variables already used by Wedel and Kamakura (2000). The occupation of the head of household was considered to evaluate family income level; the method is still generally used, though not generally accepted in econometrics (Frank et Al, 1972; McCann, 1974).

2. Product knowledge: these questions concern the level of fish product knowledge in terms of labelling, freshness, and rearing technique, themes also studied by Verbeke and Peniak (2005), Brucks (1985), Park et al. (1994), and ISMEA (2004). The freshness of the product is a major criterion of choice for the consumer (ISMEA, 2005; Verbeke and Brunso, 2006), so we wanted to verify whether the criterion is based on a real knowledge of the product or if it binds to a range of emotional prejudices. With respect to the distinction between captured and farmed fish, this section investigates the respondents' knowledge of farmed species and the potential risks associated with the two different products.

3. Perception of farm-raised and wild-caught fish: we analyse consumer evaluation of fish attributes in relation to product purchase. The study starts from two analyses conducted at Italian (ISMEA, 2004) and European (Verbeke and Brunso, 2006) levels. They showed a large consumption of farmed fish, coupled with a stated preference for the wild-caught product. Our survey investigates this conflicting behaviour. Thus, consumers were asked if they consider caught fish the best product in terms of taste, hygiene, and nutrition; with reference to farmed fish, we focused on the consumer facing product "novelty" (cost, environmental sustainability, use of antibiotics, pollution of marine and inland waters, etc.).

4. Variables of choice: the last section assesses the customers' level of consideration of price, degree of product transformation, fish species knowledge, trust in shop owners, geographic origin of the product, and the propensity for substitution of wild-caught fish with a similar farm-raised species.

Interviewees expressed their opinion through Likert scales. Nominal variables have been equally labelled with progressive numbers for further analysis. Data processing

[2] The questionnaire has been used by before by Gaviglio and Pirani (Gaviglio and Pirani, 2009) and is therefore widely tested.

can be divided into two parts: initially, descriptive analysis has been carried out, besides a contingency table analysis[3], which allows one to make assumptions about the sample behaviour to be tested with cluster analysis. In fact, especially with a large number of variables, contingency table analysis is unable to reveal realistic groups for the high number of correlation they can reveal, but they can successfully help to perform hybrid segmentation methods (Green, 1977).

The second phase consisted of a hierarchical clustering analysis, which aimed to determine the market segments composing the sample interviewed. According to Smith's market model (1956), indeed, a heterogeneous group of consumers is made up of smaller groups of consumers with similar habits. Since Smith has proposed his theory, the literature has been enriched by theoretical studies and practical uses of cluster analysis; an early overview is provided by Punj and Stewart (1983), presenting a summary of applications in different sectors, carried out using disparate statistical data and methods. Among the various models developed in statistics, the method of complete linkage clustering (included in hierarchical clustering techniques) has been used to perform the analysis. The function implemented calculates the distance between two clusters as the distance between each two farthest objects. A series of descriptive analysis has been performed to choose clustering variables and the number of clusters, involving a Chi-square test to reveal correlations between variables, which should be linked to a uniform pattern of consumption. To suit the purpose of the research, the sample was previously stratified, depending on the propensity to buy farm-raised fish, so that we started from two homogeneous consumer groups within their borders but different between themselves about the predisposition to buy farm-raised product.

Table 1 – *World evolution of fishers and fish farmers.*

Operators		*1990*	*1995*	*2000*	*2005*	*2006*
Fishers and fish farmers	Number	27,737,435	32,045,098	40,870,574	42,763,421	43,501,700
	Index	*68*	*78*	*100*	*105*	*106*
Fishers	Number	23,905,853	25,921,448	33,199,024	34,131,239	34,839,084
	Index	*72*	*78*	*103*	*103*	*105*
Fish farmers	Number	3,831,582	6,123,650	7,671,550	8,632,182	8,662,616
	Index	*50*	*80*	*100*	*113*	*113*
World production		*2002*	*2003*	*2004*	*2005*	*2006*
		Million tonnes				
PRODUCTION						
Captures		93.2	90.5	94.6	94.2	92.0
Aquaculture		40.4	42.7	45.9	48.5	51.7
	Total	**133.6**	**133.2**	**140.5**	**142.7**	**143.7**
UTILIZATION						
Human consumption		100.7	103.4	104.5	107.1	110.4
Non-food use		32.9	29.8	36.0	35.6	33.3
Pro-capita food fish apparent consumption (kg)		16.0	16.0	16.3	16.2	16.4

Data source: FAO, 2009.

3. Results and discussion

3.1. Socioeconomic characteristics of the sample

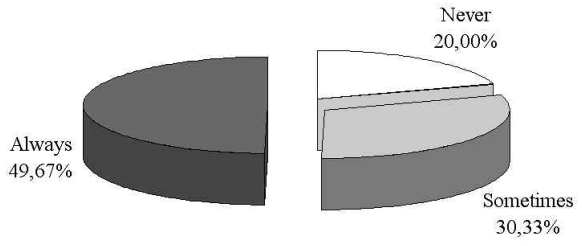
To describe the habits of costumers who purchase at traditional stores, we did 300 interviews at three sites: in a fish shop (100), at a local market (100), and at a street market (100) located in the city of Milan. The sociodemographic profile of the sample is then here presented in relation to modern distribution data, collected in a previous analysis (see Table 1). Female respondents comprised 61% of the sample (the value was the same for all three stores), representing a deviation from the modern distribution profile, where females were almost 73% of the sample. Considering age, traditional shops customers are well represented by a middle-age consumer, while young and old customers seem voted to modern distribution, in fact 68.33% of the whole sample (205 interviewees) was represented by people between 31 and 60 years old. The sample is representative of the northern Italian population, except for old people, less numerous here than in the present population (ISTAT, 2009), and male/female ratio, which is typically connected to female care of family food purchase.

A correlation was found between household head occupation, amount of purchase, and shop type. Looking at the fish shop and local market, customers had better occupations, bought fresh fish more frequently, and spent more than those purchasing at a street market. In this case, the data depict bigger families with less purchasing power compared with the modern distribution sample. For the rest, supermarket buyers appeared similarly distributed in the whole traditional retail channel sample. As expected, during preliminary data exploration, retail chain type analysis through a contingency table showed large correlations with other variables. However, the correlations did not involve a clear description of customer behaviour. This problem, also mentioned in the literature (see above-mentioned paragraphs), led to sample reunion to find realistic clusters with a stronger method. So, the next paragraphs present the rest of the descriptive analysis, considering the whole sample interviewed at traditional shops.

3.2. Sample knowledge and perception of fish products

Consumer perception was frequently different from real product knowledge. The aim of this part of the survey is to

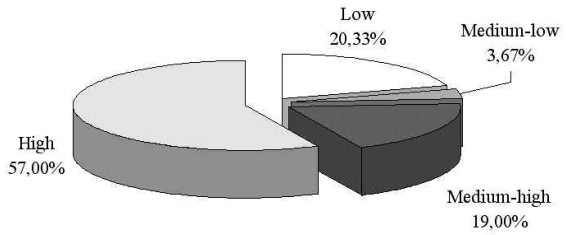
Figure 1 – *How often do you read fish product labels? (Data source: our survey).*



[3] The analysis is based on a Pearson's χ^2 -test of independence, used for categorical variables in order to verify the statistical independence between two of those (null hypothesis) or reveal their relationship when χ^2 probability is less than or equal to 0.05 (accepting alternative hypothesis).

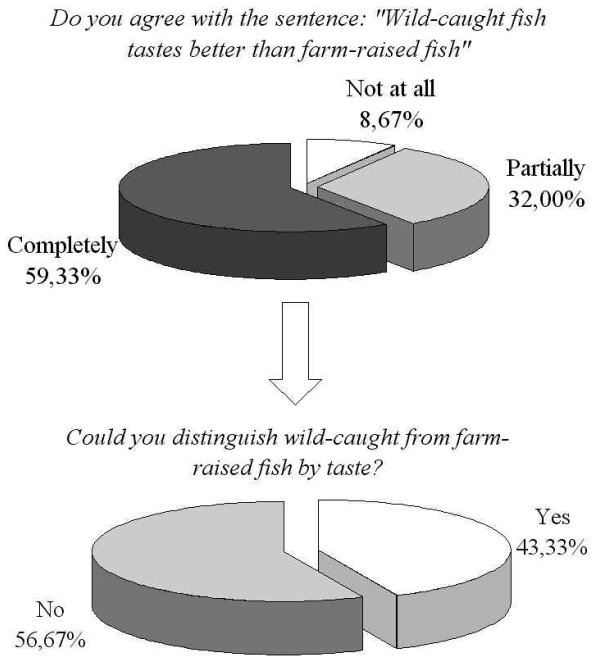
reveal customers possibly evaluating mistakes and prejudices on fish product purchasing. Most of the respondents affirmed that they always (49.67%) or often (30.33%) read product labels (Fig. 1), so that in 80% of the cases, knowledge appeared to be medium-high to high (Fig. 2). Milan customers showed good knowledge about fish freshness parameters, demonstrating that they can differentiate among products in the bench, which is in line with frequent fish consumption trends found. Equally, they proved to have a good amount of knowledge about farm-raised species

Figure 2 – *Knowledge level of labels on fish products (Data source: our survey).*



(more than 90% of the sample demonstrated medium-high to high degree of consciousness), showing that products from aquaculture are now fully established as part of consumer habits, whereas customers are less aware of the risks connected to farm-raised or wild-caught fish consumption.

Figure 3 – *Consumer opinion of the taste of fish products (Data source: our survey).*



Almost 40% of the respondents ignored the fact that farm-raised fish can contain traces of GMOs and 46% did not consider potential radioactive risks from wild-caught fish.

Considering the perception of fish products, majority of the respondents (91.33%) thought that wild-caught product tastes better than farm-raised ones. But, in 56.67% of the cases, they also admitted not being able to distinguish fish origin by taste alone (Fig. 3). This indicates one of the most common prejudices connected to farm-raised products. Consumers had even greater difficulty in recognizing the fish origin on site; the fact seems to be especially related to the Milan market where wild-caught fish is normally sold separately by size. That probably prevents 78.67% of the consumers to understand the provenance of the product, even if, theoretically, it is easy to distinguish from farmed fish. Considering quality properties of fresh fish, respondents did not exhibit a sure preference for the wild-caught product; on the contrary, only 15% of the sample respondents confidently identified differences in terms of hygienic aspects. Moreover, as to nutritional value, the interviewees were evenly distributed between those who preferred wild fish and those who did not. Respondents seemed to be more conscious of farm-raised fish. They agreed with the general opinion that it costs less than wild-caught fish, and that it could be help fish resource conservation efforts. But, at the same time, they showed some reservations on the use of antibiotics in fish-raising activities. Almost half of the sample respondents thought that it can pollute marine and inland waters.

So far, the survey revealed the consumers' profound knowledge of "typical" fish characteristics, such as degree of freshness, fish species available in the market, and their possible origin. At the same time, when interviewees evaluated the quality of the product or the production process, their perception seemed partly tied to preconceived notions possibly due to inadequate information reaching the consumers; this is probably linked to the fisheries' and aquaculture sector's marginalised size. Some results will show also that some of these aspects relate to particular behaviour, reflecting different "psychological" types of customers.

3.3 Most important variables related to choice of fish products

The last section of the questionnaire touched on a set of product attributes that can influence consumers' choice. First, respondents said that knowledge about the fish species is important. Obviously, the more it is known, the more they are disposed to buy it. Forty-five percent of the respondents believed that it is a "fundamental" characteristic, 26% regarded it "very important," and only 8.67% considered it "irrelevant." They also stated also that Italian (in 72.67% of cases) or European (69.33%) origin is an essential characteristic (this appears at least contradictory, considering the large amount of fish imported from non-EU countries and normally sold in Milan stores). This reflects a confusion among customers, whose purchasing habits are not based on real knowledge of the fish product.

What came out of the perception analysis was that the customers' answers to the choice variable reflected a "traditional" consumption behaviour, which implies a preference towards a non-portioned product. In fact, more than 70% of the sample respondents declared to be insensitive to any fish preparation, whereas 75% strongly wanted gutted fish, and 55.66% even liked it to be a 'non-cleaned' product. This is linked also to the amount of trust in they have on the fish sellers, still an important factor related to fish purchase. The price influence on the choice appeared evenly distributed–45% of respondents affirmed price as "fundamental" or "very important;" while more than half considered it "quite important" to "irrelevant".

Descriptive data showed an interesting feature: the customers demonstrated a positive and considerable disposition to replace a well-known but endangered wild species with a similar farm-raised product (Fig. 4). In most cases, they declared that they will not buy the wild product if sellers propose as alternative a farm-raised fish; on the other hand, only 30.34% will not accept the proposed alternative.

The results confirmed the market trend displayed by international and national data. While aquaculture products are steadily acquiring a new market share, the perception analysis seems to indicate that wild fish is losing some of its attractiveness, in favour of farm-raised fish, thereby overcoming initial resistance previously encountered.

3.4 Sample segmentation by hierarchical clustering

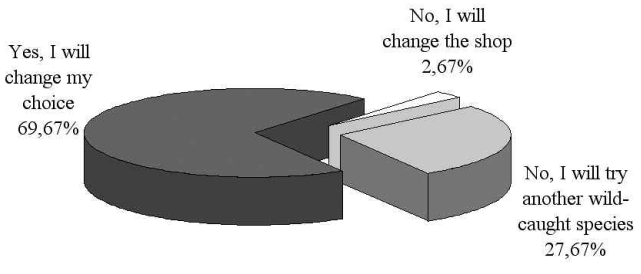
In a changing scenario, the challenge is to understand if it is possible to distinguish between groups of consumers still tied to a traditional product or consumption behaviour and those more attentive to market trends, in order to forecast their evolution and point out unused marketing opportunities for fish products. As the main target of this survey is to analyse the reasons behind farmed fish purchase or non-purchase, the sample respondents have been divided into two over-clusters, representing, respectively, consumers who are averse (91 persons) to buying or are predisposed (209 persons) to buy farm-raised product; clustering analysis has been performed separately on the two groups.

Table 2 – *Sociodemographic characteristics of the sample.*

Variable	*Local market*	*Street market*	*Fish shop*	*Traditional distribution*			*Modern distribution*[1]	
	Frequency			*Freq.*	*Perc.*		*Freq.*	*Perc.*
Gender	61	61	61	183	*61.00*		218	*72.67*
Female	39	39	39	117	*39.00*		82	*27.33*
Male								
Age	10	14	11		35	*11.67*		52
until 30	19	22	25	66	*22.00*		46	*15.33*
31-40	20	21	17	58	*19.33*		60	*20.00*
41-50	31	27	23	81	*27.00*		66	*22.00*
51-60	12	13	12	37	*12.33*		60	*20.00*
61-70	8	3	12	23	*7.67*		16	*5.33*
more than 70								
Educational qualification	33	31	16	80	*26.67*		75	*25.00*
Middle school	40	45	46	131	*43.67*		153	*51.00*
High school	27	24	38	89	*29.67*		72	*24.00*
Degree	61	61	61	183	*61.00*		218	*72.67*
Head of the family occupation								
Self-employed	25	8	27	60	*20.00*		61	*20.33*
Manager	15	9	16	40	*13.33*		22	*7.33*
White-collar	24	35	32	91	*30.33*		81	*27.00*
Blue-collar	5	14	2	21	*7.00*		27	*9.00*
Pensioner	28	30	22	80	*26.67*		99	*33.00*
Housewife/unemployed	3	4	1	8	*2.67*		10	*3.33*
Family members								
1	13	2	11	26	*8.67*		25	*8.33*
2	23	22	39	84	*28.00*		91	*30.33*
3	26	31	32	89	*29.67*		84	*28.00*
4	33	32	13	78	*26.00*		79	*26.33*
5	5	11	5	21	*7.00*		16	*5.33*
6	0	2	0	2	*0.67*		4	*1.33*
more than 6	0	0	0	0	*0.00*		1	*0.33*
Fish purchase frequency								
Monthly	8	13	7	28	*9.33*		29	*9.67*
Twice monthly	20	33	24	77	*25.67*		80	*26.67*
Weekly	72	54	69	195	*65.00*		191	*63.67*
Amount of purchase (€)								
until 10	2	4	3	9	*3.00*		39	*13.00*
11-20	45	41	28	114	*38.00*		144	*48.00*
21-30	31	44	23	98	*32.67*		84	*28.00*
31-40	11	10	18	39	*13.00*		33	*11.00*
41-50	7	1	14	22	*7.33*		--	--
more than 50	4	0	14	18	*6.00*		--	--
Total	100	100	100	300	*100.00*		300	*100.00*

Data source: our survey. 1 Results for modern distribution comes from Gaviglio and Pirani's previous survey, (Gaviglio and Pirani, 2009).

Figure 4 – *Disposition to substitute endangered wild species with similar farm-raised species (Data source: our survey).*



Considering people averse to farm-raised fish purchase (Table 2), we found two representative clusters. The biggest one refers to "hedonic consumers;" it had 70 middle-aged consumers, who belonged to small families and therefore have greater purchasing power. The cluster shows a high consciousness of the fish product, but consumers do not seem to recognise better quality properties of wild-caught fish. They are informed and their purchase of the captured product must be linked to the hedonic experience of consuming traditional dishes. They typically do not care about the price of food, but they have a demand for specific products that they are used to eating. Hedonics probably represent the future resource for fishery, so, looking at their characteristics, fishermen organisations could profit from their inclination to stick to traditional food, communicating product origin and quality or creating denomination labels where possible.

The second cluster included only 21 persons, representing exclusively old pensioners. They absolutely considered wild-caught fish better than farm-raised fish, but they are not aware of the potential risks connected to fish consumption. Their opinion seems based on such deeply rooted prejudices that they buy

more expensive wild fish, even affirming that price is a fundamental product characteristic that affects the choice of purchase. The cluster, whose members we called "traditionalist consumers", personifies an old generation of fish consumers. Even if it does not play a key role in the evolution of the fish sector (because of its size and low purchasing power), it has a constant choice behaviour that represents a little but sure share of the market. Old consumers typically keep ancient cooking customs, so marketing strategies will be less effective here. Nevertheless, wild-caught fish operators need to consider their steady demand.

The largest group of sample respondents had 209 customers who are disposed to buy farm-raised instead of wild-caught fish. The cluster analysis on this market segment led to three different clusters representing three groups with varying purchasing behaviour. The first fraction included 64 "price-forced consumers" (Table 3). The term reveals the obligation to purchase farmed species as linked to the cheapness of the product, even if their preference is for wild-caught fish. In reality, they would want a traditional product, orienting their choice to well-known species and shops. These characteristics were highly relevant to this cluster, settled by middle-aged and young pensioners buying mainly at street markets, with small families, and medium-low educational qualification. So, price restriction seemed to be confirmed by the socioeconomic profile of the consumers. This group can be exposed to adequate communication strategies that aim to make them conscious of the quality of farm-raised product. Filling this gap will help them accept the product that they seem to dislike, thus creating a new confidence with it.

Table 3 – *Segmentation results for consumers averse to farm-raised fish purchase.*

Variables	*Cluster 1*	*Cluster 2*	*Pearson's χ-square Significance*
	Hedonic consumers	***Traditionalist consumers***	
Age[1] *(mean)*	2.83	5.00	0.000
Educational qualification	High school	Middle school	0.000
Head of the family occupation	Distributed	Pensioner	0.000
Family members *(mean)*	3.03	2.52	0.008
Farm-raised fish knowledge degree	High	Medium-Low	0.001
Wild-caught fish knowledge degree	High	Medium-Low	0.038
Wild-caught fish is better for hygienic properties	Partially	Completely	0.015
Wild-caught fish is better for nutritional quality	Distributed	Completely	0.005
Farm-raised fish is better for fish resources conservation	Completely	Partially	0.035
Aquaculture is dangerous for antibiotic use	Partially e	Distributed	0.049
Price relevance on choice	Irrelevant	High	0.024
Sample distribution by clusters	**70**	**21**	***Total = 91***

Data source: our survey. [1]Values referring to "Age": 1= until 30 years; 2= 31-40; 3= 41-50; 4= 51-60; 5= 61-70; 6= more than 70 years.

Table 4 – *Segmentation results for consumers disposed to farm-raised fish purchase.*

Variable	*Cluster 1*	*Cluster 2*	*Cluster 3*	*Pearson's χ-square Significance*
	Price-forced consumers	***Trend-influenced consumers***	***Market-attentive consumers***	
Retail channel type	Street market	Local market and fish shop	Street and local market	0.000
Age[1] *(mean)*	4.23	3.30	2.57	0.000
Educational qualification	Medium-low	Medium high	Medium	0.000
Head of the family occupation	White collar; pensioner	Self-employed; manager; white collar	Distributed	0.003
Family members *(mean)*	2.73	2.81	3.30	0.021
Farm-raised fish knowledge degree	Medium	Medium-High	High	0.014
Wild-caught fish tastes better than farm-raised	Completely	Completely	Partially	0.000
Aquaculture pollutes more than fishing	Partially	Partially	Not at all	0.000
Aquaculture is dangerous for antibiotic use	Completely	Partially	Partially	0.004
Price relevance on choice	High	Low	Medium	0.000
Fish species knowledge relevance on choice	Fundamental	Distributed	Medium	0.000
Fish product processing relevance on choice	Low	Irrelevant	Medium-Low	0.000
Trust in retailer relevance on choice	Fundamental	Fundamental	Medium-High	0.021
Sample distribution in the clusters	**64**	**57**	**88**	***Total = 209***

Data source: our survey. [1]Values referring to "Age": 1= until 30 years; 2= 31-40; 3= 41-50; 4= 51-60; 5= 61-70; 6= more than 70 years.

The second cluster was composed of "trend-influenced consumers." They are young, have medium to high purchasing power, not affected by low product price, and buy at the local market and fish shops. The appellation refers to their vulnerability to messages coming from mass media, often creating new purchasing behaviour. They stated a preference for wild-caught products and, even with a good knowledge of farm-raising activity risks, their disposition towards new products is affected by new reservations and old prejudices. This creates a new type of hedonic consumer, admitting food novelty on the condition of good communication, which aims to justify the choice. Farm-raised products must be linked to environmental protection and nutritional quality, which will tie sensory consumption with the whole meaning of a "future" fish product.

The last group consisted of 88 persons. Though not clearly depicted, the cluster seemed to reflect the "market-attentive consumers." The phrase is derived principally from their socioeconomic characteristics, which portray young families with one or two children and high level of farm-raised fish knowledge. This reflects a predictable sensitiveness to food issues, leading consumers to search for real information and make conscious choices. In fact, no product characteristics restrict their choice, indicating that they can distinguish between products on the market, that any fish attribute can be positive or negative depending on the selection process. They are prepared to spend an adequate amount for all the products, but they need to be reassured on their choices with clear and helpful labels.

Conclusions

The two different sectors of the Italian fish supply chain reflect two different economic conditions. While fishers suffer from scarce marine resources and fuel prices, fish farmers gain more market shares every year, taking advantage of the increasing fish demand. On the other hand, fish quality perception appears tied to ingrained habits, which prevent consumers to either to follow or understand new market trends. Operators should therefore design a product diversification plan that would disseminate more information to customers and possibly justify the preference for Italian products.

Our survey highlights the characteristics of fish consumers who use traditional retail channels to assist fish operators in planning new marketing strategies. The method enabled us to differentiate between customers on the basis of their attitudes and to describe similar behaviours. Maintaining the difference between customers who are disposed and averse to farm-raised fish purchase, we first divided the sample in two parts. The farm-raised averse group, which counts for almost one-third of the whole sample, is composed of two clusters, one representing hedonic and the other, old-generation consumers. Both represent a sure resource for fishers, but, probably, only the hedonic cluster can be profitably exploited through marketing strategies describing traditional products, possibly by means of new labels, brands, and eventually a denomination of origin.

The group disposed to purchase farm-raised fish has been segmented into three clusters. The price-forced consumers are those who prefer wild-caught product but instead buy farm-raised fish for its low price. They are probably not totally satisfied with their choice, so operators must reduce the gap between the two products as soon as possible, pointing at the farm-raised product's intrinsic quality. The second cluster includes trend-influenced consumers, those who prefer wild-caught product and demonstrate attention to seller's opinion. This seems to indicate a certain inclination to a new type of hedonic consumption, contemporaneously linked to traditional customs and market issue evolution. So the cluster could be attracted by the "novelty" of farm-raised fish, such as the ecological potential, which really is a major strength. The last cluster refers to new typical consumers, the market-attentive ones, who can distinguish between different goods, showing the ability to recognise different prices for each product. This necessitates that Italian producers restate the information profile of their product to strengthen the relationship with customers.

Even if some different attitudes have been found, the study generally shows a confused fish product perception, which presents a great risk for Italian fishery and aquaculture. In fact, the Italian fish sector suffers more from the competitiveness of foreign products rather than from low market prices. Operators must internalise the need to diversify production in order to evade direct competition and exploit the synergies offered by the Italian agro-food sector.

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