CASE STUDY ON THE IMPLEMENTATION OF TRACEABILITY AND THE DECISION TO BUY FISHERY PRODUCTS

Carmen Georgeta Nicolae[1*], Monica Paula Marin[1], Elena Pogurschi[1], Gratziela Victoria Bahaciu[1], Liliana Mihaela Moga[2], Magda Nenciu[3]

[1]University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania
[2]Dunarea de Jos University, Galati, Romania
[3]National Institute for Marine Research and Development "Grigore Antipa", Constanta, Romania

Abstract

According to the Regulation (EC) No 178/2002, food business operators are responsible to achieve the relevant requirements for food safety. Aquaculture, fishery, processing and distribution of fish and fishery products should be carried out respecting and ensuring food safety and quality conditions. Implementing a traceability system significantly reduces the exposure to the economic food chain, guarantees food safety, transparency and increase consumer confidence. In this regard, the study was undertaken based on the questionnaires applied to aquaculture operators and future specialists in the field. According to the results, the main benefits that the company may achieve by implementing a system of traceability of quality are: improving management quality and safety of production, improving company's image and increasing the company's role in the supply chain (100% totally agree). The main barriers of a traceability system for aquaculture are considered to be the high cost and the lack of policy encouraging (87.50% strongly agree). According to the future specialists in the field, the decision to buy fishery products (agree, strongly agree) is less influenced by price (50.89%) and more by storage conditions (86.61%). The results of this study may serve as information material for fishery product traceability system.

Key words: fish, food chain, food safety, products, traceability

INTRODUCTION

Traceability is the ability of a food, feed or a substance to be able to go back through all the production and distribution stages, which also include import, primary production and selling points. In the case of food industry, many of the production companies have chosen to implement the quality management system based on ISO and European Union requests to establish a registration system that allows products traceability.

An accurate implementing of a traceability system significantly reduces the exposure of food companies to specific risks in the food chain. This is achieved by fast and efficient identifying, isolation and correction of any issue that might appear. Therefore, food safety is guaranteed and the negative economic impact of this is downplayed. An effective traceability system is also guaranteeing the market differentiation of the agro-food products having certain attributes (e.g. ecological products) in a scientific, trustful and transparent way [1].

The aquaculture and fisheries are very diverse sectors which use different breeding and fishing technologies and provide a wide variety of specific products. This determines a real complexity of the supply and distribution chain for fish and fishery products, including the links from the production point (fishery or aquaculture farm) to the final consumer. The components of the distribution chain vary with the geographic areas, type of farms, transportation, information on the fishery market and management systems [3].

[*]Corresponding author:
carmennicolae19@yahoo.com
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The traceability system is considered an efficient instrument to guarantee safety of fishery products and improve the transparency of supply chain [2].

MATERIAL AND METHOD

In Romania, as well as worldwide, the fishery sector is continuously developing, both in terms of aquaculture and marine and inland fishery.

Identifying the key factors that influence the decision of companies to implement an IT quality traceability system represents the first step in the modernization of the industry.

The present paper is trying to identify the main key factors that might stop a company to implement an IT system for traceability monitoring. We have done this by filling in the questionnaires that are asking some companies representatives about these factors.

The questionnaire content for enterprises is divided in four parts which include the general data, the factors that determine the decision of implementing of an IT system for quality traceability in the company, the benefits and the difficulties of traceability system adoption [4].

The decision of buying fishery products was presented in this study through the point of view of the future specialists that will be involved in production, processing and distribution of fishery products.

In both types of questionnaires, the respondents were asked to evaluate their answers on a five points Likert scale (from 0 to 5) which varies for "totally agree" to "totally disagree".

A basic statistical analysis based on percentage, frequency and comparison methods was conducted for the characteristics of the traceability system adoption in enterprises and for the decision to buy fishery products. The Analytic Hierarchy Process is adopted for analyzing the performance of traceability system adoption in fishery businesses area.

RESULTS AND DISCUSSIONS

In order to obtain information regarding traceability in aquaculture, questionnaires were sent to 15 fisheries in South Romania area. 8 companies have replied to the request to fill in the questionnaires (53.33%). The eight respondents companies were basically aquaculture private companies that sell the production internally (inside Romanian borders). Their turnover varied from less than 50.000 lei (3 companies) and between 500.000 - 2.500.000 lei (one company); 2 companies had 50.000 - 250.000 lei and 2 companies had 250.000 - 500.000 lei. Data regarding the answers on the key factors that influence the decision of a company to implement an IT quality system for traceability is shown in Table 1.

Table 1 Incentive factors for the Implementation of traceability system to enterprise

Answer: / Question:	Percentage %				
1.Totally disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Totally agree	1	2	3	4	5
Improvement of the products quality	-	-	12.50	-	87.50
Improvement of food quality management mode	-	-	-	-	100.00
The highlight of enterprisers	-	-	12.50	-	87.50
Exploiting market abroad	-	-	25.00	12.50	62.50
Adaption to health and safety of consumption demand	-	-	-	-	100.00
Expanding the domestic market	-	-	-	-	100.00
Ascending corporate public image	-	-	-	-	100.00
Product differentiation	-	-	12.50	-	87.50
Customer requirements	-	-	25.00	12.50	62.50
Follow the similar enterprises which have adopted the traceability system	-	-	-	12.50	87.50
The encouragement and preferential policies of Government	-	-	-	-	100.00

The decision to adopt and implement an IT traceability system in the company depends on the following factors: improvement of food quality management mode, adaption to health and safety of consumption demand, expanding the domestic market and ascending corporate public image (100% totally agree).

All respondents were also totally agree with the need for an official support of the State in the implementation of an IT system of traceability through politics and financing policies which can guarantee the food safety.

According to the results (Table 2), the main benefits that the company might have by implementing a traceability of quality system are: improving management quality and safety of production, improving company image and increasing the role of the company in the supply chain (100% totally agree).

The respondent aquaculture companies agree and totally agree (87.50%) with the benefits that come with the increasing of the market competitiveness and with the decreasing of the loss due to the lack of complying with the food safety requests.

Table 2 The potential benefit of enterprise by implementing traceability system

Answer: / Question:	Percentage, %				
1.Totally disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Totally agree	1	2	3	4	5
Improvement of product quality and food safety management	-	-	-	-	100.00
Extending products trade in market	-	-	-	12.50	87.50
Improvement of corporate public image	-	-	-	-	100.00
Improvement of market competitiveness	-	-	12.50	12.50	75.00
Ascension in supply chain management level which the enterprises belong to	-	-	-	-	100.00
Reducing loss of food for safety reason	-	-	12.50	12.50	75.00

The main barriers of the traceability system implementation for aquaculture enterprises are considered high cost and lack of policy encouraging (87.50% strongly agree) (Table 3).

Only one company has been totally disagree with the barriers mentioned in the questionnaire. It is possible that this company to already have a traceability system for the fishery products and also a good production plan.

Table 3 The implement barrier of the traceability system for enterprises

Answer: / Question:	Percentage %				
1.Totally disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Totally agree	1	2	3	4	5
The high cost of system implementation	12.50	-	-	-	87.50
The shortage of management and technical personnel	12.50	-	25.00	-	62.50
Non-uniform market standard	-	-	25.00	-	75.00
Uncertain future earnings	12.50	12.50	-	-	75.00
The difficulty of management process changing	12.50	-	12.50	12.50	62.50
The difficulty of workpiece process changing	12.50	-	12.50	-	75.00
The lack of related preferential policies	12.50	-	-	-	87.50

In order to obtain the data regarding the buying decision for fishery products, we have interviewed 112 future specialists in the field of production, processing and distribution of fishery products. They were represented by students of the Faculty of Animal Science of University of Agronomic Sciences and Veterinary Medicine of Bucharest.

According to them, the decision to buy fishery products (agree and strongly agree) is less influenced by price (50.89%), which means that when they have to buy fishery products it's more important the quality that the price of the products (Table 4).

Table 4 Factors that influence the buying decision of the fishery products

Answer: / Question:	Percentage %				
1.Totally disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Totally agree	1	2	3	4	5
In choosing a fishery product, the price is important	13.39	19.64	16.08	31.25	19.64
In choosing a fishery product the freshness is important	2.68	3.57	7.15	10.71	75.89
In choosing a fishery product the expiring date is important	1.79	3.57	8.94	15.18	70.54
In choosing a fishery product, the origin is important	4.46	18.75	8.94	21.43	46.43
In choosing a fishery product, the farming production conditions of fish are important (water, soil)	1.79	1.79	16.08	25.00	55.36
In choosing a fishery product, the feeding of fish is important	0.89	2.68	15.19	23.21	58.04
In choosing a fishery product, the fish and fishery products shipping conditions are important	3.57	2.68	11.62	18.75	63.39
In choosing a fishery product, the fish and fishery products storage conditions are important	3.57	2.68	7.15	21.43	65.18
In choosing a fishery product, the fish and fishery products processing conditions are important	4.46	5.36	5.37	23.21	61.61

Almost 50% of the respondents (46.43% exactly) are totally agree that the origin of the fishery products is important, which means their increased attention to the fish source (Figure 1).

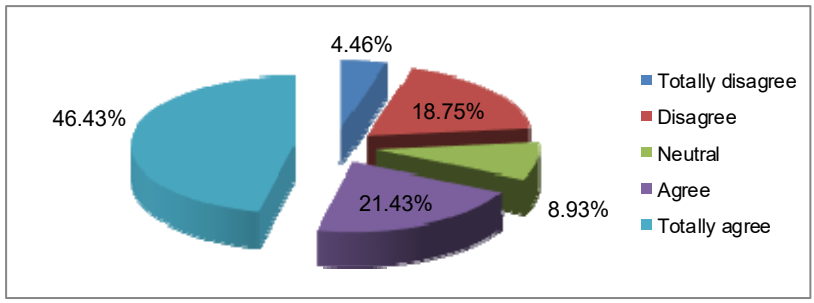

Fig. 1 The importance of the origin in buying decision of fishery products

Furthermore, the apparent degree of freshness is very important for 75.89% of the respondents (Figure 2), and also the same with the validity period of the fishery products 70.54% of the respondents, respectively.

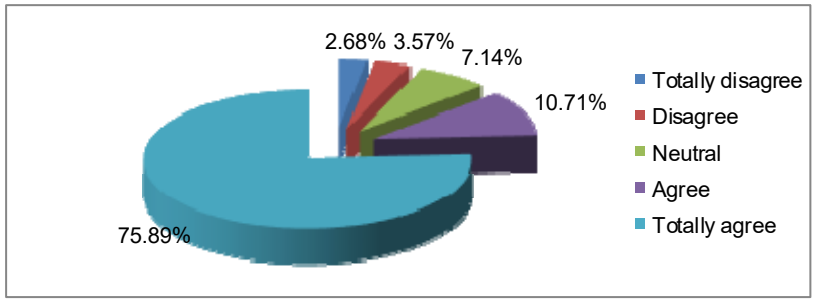

Fig. 2 The importance of the apparent freshness on the decision of buying fishery products

Almost 80% of the respondents were agree and totally agree that the decision of buying of fishery products is influenced by the feed and the environmental conditions of fish breeding.

The storage and processing conditions of fishery products were also essential for 86.61% of the respondents and 84.82% respectively (agree and totally agree) in the buying decision of this category of food (Figure 3).

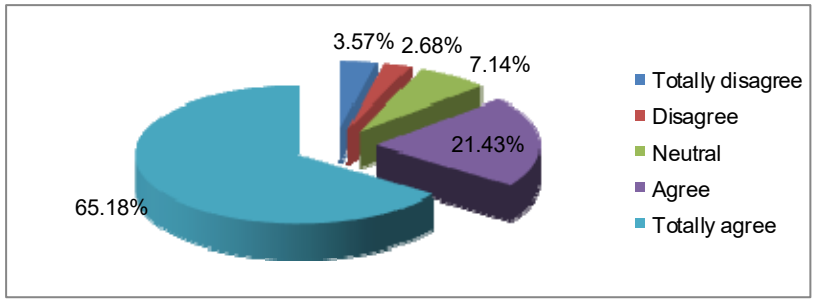

Fig. 3 The importance of the storage condition on the buying decision of the fishery products

CONCLUSIONS

This study represents an investigation on the developing of a production-processing-selling chain for the fishery products, with a traceability system. The study is underlying the different organisation possibilities, is focused on the relationships between the participants and also is analysing the risks, costs and gains sharing in order to improve the food safety for the final consumer.

In order to have a balance between offer and request on the fishery market, distributors must adopt and apply a responsible marketing politics which involves information on the products and their pathway "from farm to fork".

The assurance of food quality and safety of the fishery products is very important in buying decision.

The results of the present study may consist in an informative material for the fishery production, processing and distribution areas also in terms of implementing of a traceability system.

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