

FISH FOOD SECURITY AND CONSUMER PERCEPTION OF FISH CONSUMPTION

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Abstract

This paper aims to analyse consumers' perceptions of food safety from the point of view of fish and fish products consumption using data obtained from 600 questionnaires completed annually in the 2017-2020 period, across the country. The analysis included the proportion of consumers, the frequency of consumption, the reasons for consumption and the criteria that are taken into account in choosing the product, these two after being analysed in terms of gender and age. In Romania, 91% of the population are fish or fish products consumers, comparable to the other European state, but the kg per capita is still one third of the European average of 24.4 kg per capita. Between 21% and 25% of the population eat fish and fish products more than two times a month, especially fresh fish and roe salad, the main reason being that it is a much healthier food than other types of meat (79% of consumers). Women appreciate more than men the benefits of eating fish and fish products and associate this consumption with ensuring food safety, while by age the group of 29-40 appreciates the criteria related to food safety. Fish consumption remains a defining element of food safety in traditional areas, while the rest of the population needing information/awareness campaigns on the benefits of fish consumption.

Key words: fish, fish consumption, consumers, food safety

INTRODUCTION

The benefits of fish consumption are well known, with fish being one of the most valuable foods. Fish meat belongs to the second group of foods, which contains proteins with high biological value (contain essential amino acids) and substantial intake of B vitamins (niacin, riboflavin, pyridoxine, pantothenic acid, folic acid, cyanocobalamin), some of them with hematopoietic role (riboflavin, pyridoxine, folic acid and B12) and fat-soluble vitamins (A, D) [3] [13] [16]. Fish consumption in Romania has almost doubled in recent years, from 4-5 kg per capita in 2013 to 8 kg per capita in 2018 [14], but still remains far behind the EU average, of 24.4 kg per capita.

This paper mainly analyses the behaviour/perception of the population regarding the fish and fish products consumption and ensuring food safety in terms of frequency of consumption, the

reasons behind the consumption of fish and the selection criteria of fish and fish products. The fish consumption in Romania is approx. 125,000 tons, of which approx. 25,000 tons are produced nationally, from fishing and aquaculture, and the rest of approx. 100,000 tons are imported. Over 90% of imported fish is represented by marine species that cannot be obtained locally.

Fish and fish products consumption plays a key role in ensuring food security, both nationally and internationally. In Romania, the role in ensuring fish food safety is given not only by eating quality food, but especially by the existence of traditional communities in fishing, and even aquaculture, where, due to living conditions, fish is the main source of food.

MATERIAL AND METHOD

FAO analysis concludes that "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for

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an active and healthy life". This has led to the appearance of 4 guidelines in ensuring global food security: (1) the availability of sufficient food; (2) people's ability to access this food; (3) food quality and use; and (4) continuous access to food over time (stability) [6] [7] [11].

The paper is based on data collected between 2017 and 2020, in annual surveys conducted by IRDAEFA throughout National Program for Data Collection in fisheries sector. In order to achieve the objectives, the survey was conducted based on a questionnaire, related to the two groups of consumers of fish meat targeted - consumers of fish and fish products, respectively non-consumers of fish and fish products. The questionnaire included a series of 15 questions of the following types: open and assisted; closed with two alternatives, or multiple with exclusive and non-exclusive answer alternatives and mixed questions. The order of placing the questions in the questionnaire follows the general placement recommendations: protocol for opening the communication; filter questions, open, closed and mixed questions; personal information for defining demographic variables being placed at the end. The collected data will be statistically analysed obtaining relative and absolute frequencies, represented graphically, for all the questions depending on the established socio-demographic variables.

The sampling framework population consisted of people over 15 years of age from all urban and rural localities in the eight development regions of Romania. The questionnaire was applied to 600 respondents, considered representative for the population aged 15 and over in Romania, at an error of 6% and a confidence level of 95%. The sampling plan was made with the help of INS databases made following the last population census, the sampling being a simple random one thus ensuring a proportional distribution of respondents for the 8 development regions. Depending on the type of residence (urban and rural), the number of interviews was established, being proportional to the distribution of the population by types of localities in each region.

The research methodology aimed to create an image about the consumer's state / perception regarding the consumption of fish and fish products, being structured on: type of consumer (regular, non-regular), frequency of consumption, reasons for consumption and criteria used in the purchase of fish or fish products. The last two categories are also analysed in terms of age or gender. These socio-economic factors influence consumers' perceptions of the consumption of fish and fish products [11] [16] [17].

RESULTS AND DISCUSSION

In Romania, 91% of the population is fish and fish products consumers, while 9% are non-consumers (table no. 1), the data for the 4 years did not register significant variations

Table 1 The proportion of fish and fish products consumers and non-consumers

Year	Consumers (%)	Non-consumers (%)
2017	89.70	10.30
2018	93.70	6.30
2019	89.20	10.80
2020	91.50	8.50
Mean	91.03	8.97

Compared to the development regions of the country, the highest consumption is in the south-eastern region, followed by the southern region and the north-eastern region. Regarding the frequency of consumption, 25% state that they consume twice a month, 24% once a month and 21% weekly (table no. 2). Also, those who consume twice a week are 18%. Compared to the trend of recent years, there is a slight increase in those who consume daily, from 0.96% in 2017 to 3.75% in 2020. The most constant segments are those who consume twice a month, followed by those who consume twice a week. Studies in different parts of Turkey show a percentage of consumers ranging from 85% to 98% [1] [2] [4], and the frequency of consumption is once a week (35%, 46%) or twice per month (24%) [2] [4]. 25% of consumers in Belgium, Denmark and the Netherlands consume fish or fish products more than once a week, while 75%

of consumers in Spain consume at least twice a week [12]. In the USA, 46% of consumers consume once or several times a week, while 29% consume once or more a month [9]. In another study conducted in Romania, on the

population segment 18-21 years, consumers of fish and fish products represent 96% and 36% of them frequently consume fish or fish products [8].

Table 2 Frequency of fish and fish products consumption

Frequency	2017	2018	2019	2020	Average
Daily	0.96	0.51	1.72	3.75	1.74
Weekly	21.17	31.12	17.52	15.61	21.36
Twice a week	15.61	14.80	22.28	19.19	17.97
Monthly	27.56	17.35	22.76	28.73	24.10
Twice a month	22.80	25.27	27.73	25.11	25.23
Other option	11.90	10.95	7.99	7.61	9.60

Consumer preferences are constant, with small insignificant variations, the most consumed being fresh fish by 84% of consumers, followed by roe salad, preferred by 65% of consumers and frozen fish by 52% of consumers, according to figure no.1. Frozen fish is especially preferred in rural communities because fresh fish is rarely or not at all found. Following a study on the young population in Romania, aged 18-21, concluded that 55% prefer fresh fish and 20% prefer frozen fish [8]. Fresh fish is preferred by the vast majority of consumers, as stated in similar papers, for example in Turkey the consumption of fresh fish is between 94 and 97% [2] [4], in the US over 96% [10]. At the same time, in China, almost 77% of consumers prefer fresh fish [5].

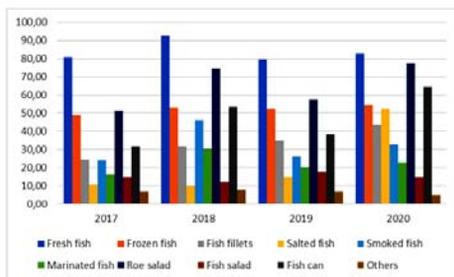


Fig. 1 Preferences for fish and fish product type

The main reason behind the fish consumption is that it is a healthier food than other types of meat, according to 79% of respondents, followed by the fact that it is a based food for 34% of respondents and 24 % consumes as a result of the doctor’s recommendation (figure no.2).

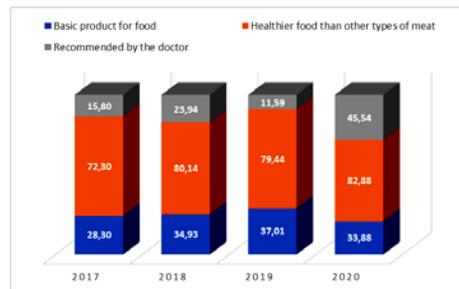


Fig. 2 The reasons behind the fish and fish product consumption

The reasons for fish and fish products consumption have not changed significantly in the last 4 years. This shows that the population is informed about the benefits of eating fish, but only half of those informed also consider that it is a basic product in the diet. In Flanders, Belgium the general opinion is that the fish consumption is healthy and it is a basic food in the diet [17], while in the USA approx. 40% of consumers of fish and fish products consider it a healthy food [18]. In the Istanbul population study, 85% of them consider fish to be a healthy food [4].

From a gender point of view, it does not influence the reason for consumption, with 78% of men and 79% of women considering fish to be a healthier food than other types of meat (table 3), which is part of the general perception. Also, the reason “recommended by the doctor” is not influenced by gender, 24% of women and 25% of men taking into account this criterion. There is some influence of gender on the reason “basic

product for health” where 36% of women consider this important and only 31% of men agree. At the same time, there is some influence in the responses in 2020, probably partially affected by the pandemic where, the reason “recommended by the doctor” for women are more important than in previous years, while for men, only in the last year

there is a greater importance. Norwegian women in the 45-69 age group consider fish to be a healthy food, while women in Istanbul or some areas of the USA consume more fish and fish products than men without identifying the reason [1] [15].

Table 3 The reasons for fish and fish product consumption by gender

Year	Basic product for food		Healthier food than other types of meat		Recommended by the doctor	
	♂	♀	♂	♀	♂	♀
2017	32.20	23.80	72.80	71.80	15.80	15.90
2018	32.67	38.68	80.68	79.25	21.02	28.77
2019	34.97	35.62	81.65	76.26	11.71	11.42
2020	26.07	45.29	77.91	90.13	50.61	38.12

From the point of view of the age group, those between 29 and 40 years old consider most that fish is a basic product in the diet, and those over 50 years old consume the most fish and fish products on the doctor’s recommendation (figure no. 3). The whole population, regardless of age, eats fish because they consider it a healthier food than other types of meat. However, those over the age of 40 consume the most for this reason.

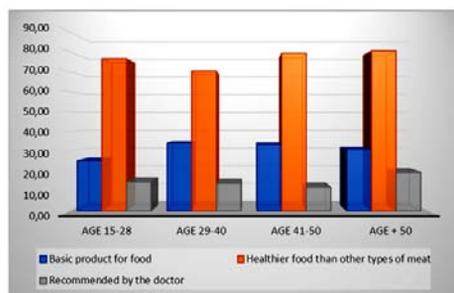


Fig. 3 The reasons for fish and fish product consumption by gender

Regarding the criteria for selecting fish or fish products, the majority of consumers (78%) consider freshness to be the most important reason. Other important criteria underlying the choices and showing the perception of food security are the taste characteristics for 41% of respondents, 40%

choose according to the quality / price ratio, 34% according to the general appearance and 32% according to the origin of the product (figure no. 4).

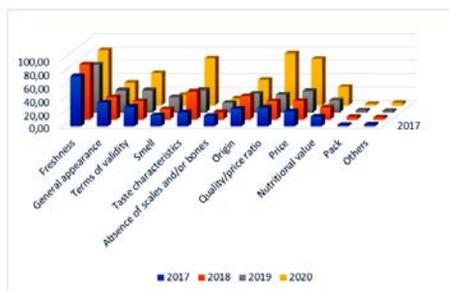


Fig. 4 Criteria for the selection of fish/fish product

Compared to other years, in 2020 the attitude towards food safety has changed, more and more consumers having among the purchase criteria freshness (82%), taste characteristics (70%), quality / price ratio (77%) or nutritional value (28 %). Women are more interested than men in the criteria related to food safety: general appearance, quality / price ratio, nutritional value, shelf life, while men are more concerned with freshness, origin and taste (figure no. 5). However, with the exception of the “smell” criteria, the differences between women and men are not significant in terms of fish

consumption, with women only having a more important role in choosing according to food safety.

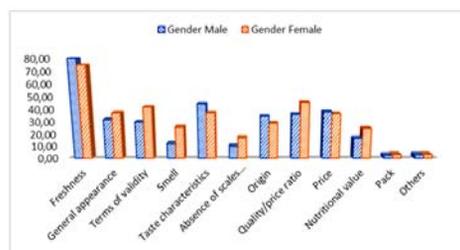


Fig. 5 Criteria for the selection of fish/fish product, by gender

From the point of view of age, in figure no.6 it is observed that the segment 29-40 years old is the most interested in freshness (80%), while the category 15-28 years old is the least interested (65%), however, the values being not significantly different. This segment of the population is also the one that is most interested in the criteria of validity (37%) and nutritional value (27%). The criteria “general appearance” and “taste” are the criteria that do not take into account age in choosing the product, while the population over 50 years is most interested in the quality / price ratio (41%) much more than the other categories of age.

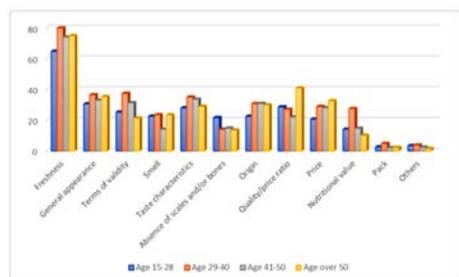


Fig. 6 Criteria for the selection of fish/fish product, by age

CONCLUSIONS

Fish and fish products consumption in Romania, although quantitative is one third of the average consumption in the EU (24,4 kg per capita), over 90% of the population consumes fish and fish products at least twice a month, an attitude that is in line with the

European average. From the existing data, the highest consumption is recorded in the autumn-spring period, overlapping with the period of traditional religious holidays. Although three quarters of the population are aware that fish is a healthy food, which ensures food security, still a little more than 50% of them consider it a basic food product, which determines the need for a study to identify the causes. From this point of view, it seems that women appreciate more than men the benefits of eating fish and fish products.

The population of Romania mostly prefers fresh fish, but in non-traditional areas or where it is rarely found, frozen fish is consumed. This aspect is not a novelty in consumer behaviour, especially since in the years 1970 - 1980 Romania benefited from an important fleet of ocean fishing that produced approx. 120,000 tons of frozen fish that were distributed on the domestic market. Thus, consumer behaviour is not significantly changed, their perception of food security in terms of fish consumption remaining at similar levels, with a slight upward trend. If in the traditional areas of the country the fish consumption remains a defining element of food security, for the rest of the population there is a need for information / awareness campaigns on the benefits of eating fish, regardless of age or gender, and especially fish from aquaculture. New technologies for the improvement of administered feed, especially with phytoadditives rich in essential fatty acids (omega 6, omega 9) are reflected, in growth parameters and in the quality of the meat obtained, with multiple human health benefits.

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