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## **THE AVAILABILITY OF FRESH AND FROZEN FISH IN THE URBAN AND RURAL AREAS**

*Eating fish is an indispensable element of a proper and well balanced diet. Despite the benefits of consuming fish, their consumption in Poland is still at a low level. At present, buying fresh fish in the urban areas is not much of a problem for consumers, because they can be purchased in fish stores, as well as in large commercial networks or at marketplaces. The aim of the study was to compare the consumers' opinions on the availability of fresh and frozen fish in urban areas and in rural areas of Wejherowo district. The study was conducted with the use of a questionnaire survey in the group of 180 not randomly chosen people. According to respondents' opinions on the availability of fish it appears that urban areas of Wejherowo district are characterized by high availability and a wide range of fresh and frozen fish, while rural areas have limited access to those products.*

**Keywords:** *consumer, fresh and frozen fish, the availability of fish*

### **INTRODUCTION**

Proper functioning of the body requires provision of essential nutrients present in food thus consuming food products originating from different food groups is of high importance. Consumption of fish is an indispensable element of a proper and well balanced diet for humans, because fish belong to products that contain a significant amount of highly-digestible proteins and essential amino acids, polyunsaturated omega-3 fatty acids and vitamins, and in comparison to meat of slaughtered animals fish contain more phosphorus, iodine and potassium [1].

According to the data presented by the Marine Research Institute consumption of fish in 2014 amounted to 12,86 kg per person, whereas a year earlier it was by 8,4% lower and amounted to 11,86 kg per person [2]. Despite the benefits arising from consuming fish their consumption in Poland is still at a low level. For the statistical comparison average Norwegian person eats 46 kg of fish per year, and the Portuguese person consumes about 60 kg [3]. At present buying fresh fish in urban areas is not much of a problem for consumers, because they can be easily purchased in fish stores, in large commercial networks or at marketplaces. Most of the points of sale also offer frozen fish, which can be bought in many forms.

The availability of fish in rural areas is different, as there frozen fish are definitely products that are more easily available in terms of logistics [4], while the points selling fresh fish occur sporadically and usually sell fish only on Thursdays or Fridays. This is connected with religious tradition and habit to consume fish products during the given period [5, 6].

The aim of the study was to compare the consumers' opinions on the availability of fresh and frozen fish in urban areas and in rural areas of Wejherowo district.

## RESEARCH MATERIAL AND METHODS

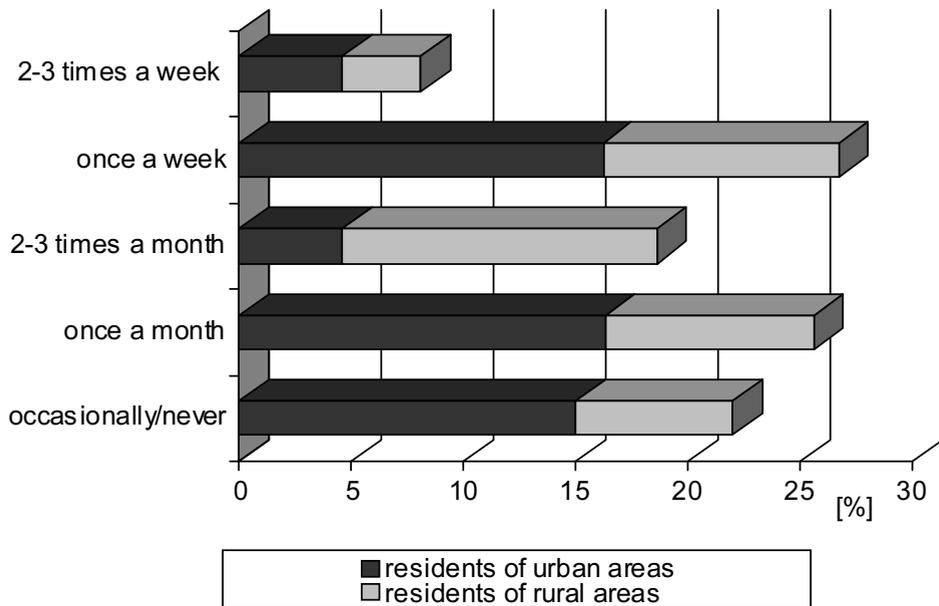
Empirical study was conducted with the use of the authorial questionnaire survey in summer period in 2014 in a group of 180 not randomly selected people. During analysis of the surveys 8 incorrectly completed questionnaires were excluded, so further analysis of the results of the tests was carried out on the basis of information obtained from 172 respondents. People living in urban areas accounted to about 56%, of which 60% were women and 40% were men. Rural area was represented by 44% of the respondents, among them 63% were women and the remaining part were men. Information on the availability of fish was obtained via interview method, with the use of prepared for this purpose, a special questionnaire that included 9 questions.

Six questions included in the questionnaire were closed type questions, but in some questions more than one answer was allowed. The respondents answered questions about frequency of consumption of fish, what species of fresh and frozen fish they purchased most often, in what form they purchased frozen fish, places where they purchased their fish products and the availability rate of fresh and frozen fish in their area, and what species are available in their area. In the last question, respondents were asked to express their opinions: if they were satisfied with the purchased fish, and in case of negative answer they were asked to specify the reasons of their dissatisfaction. During the analysis of the results elements of descriptive statistics were applied with the use of Excel 2007. The analysis was conducted for the significance level  $p < 0,05$ .

## RESULTS AND DISCUSSION

On the basis of the carried out study, it was found that nearly 21% of the interviewed respondents ate fish occasionally or never, among them more than two-thirds were residents of urban areas. Once a week these products were consumed by 26,7% of the respondents, while in the prescribed amount, i.e. at least twice a week fish were eaten by slightly over 8% (8,1%) of respondents [7].

Similar results on the frequency of consumption of fresh and frozen fish in their studies obtained Cieřlik et al. [8]. In both variants of answers, better results were obtained for the inhabitants of the city (Fig. 1). People living in rural areas usually ate fish 2–3 times a month.



**Fig. 1.** Comparison of the frequency of fish consumption by the residents of the urban and rural areas

Studies show that the most commonly purchased species of frozen fish among respondents were cod and pollock, respectively around 42% and 28% of indications. The rarest species were hake and tilapia as those were chosen by only 4,6% and 2,3% of the polled. Cod and pollock were also the most preferred species of fish in the study conducted by Cieřlik et al. [8]. Among the surveyed people, most of them lived in urban areas, almost 9% did not buy frozen fish at all. Both, the inhabitants of the city and the countryside, chose cod as their favourite species of fresh and frozen fish and it was chosen by more than 53% of the respondents. Obtained results agree with indicated writing and confirm that most favourite species of fish among consumers who consumed fresh fish is cod [4]. Residents of the city as second favourite fish species pointed out trout (over 33%), while the villagers pointed out herring (42%). Preferred by respondents form in which they most often bought fish were frozen fish fillets, that also belong to the most popular forms of frozen fish which are available on the market. This answer was given by about 65% of the interviewees living in urban and rural areas. The fish cubes were chosen by 25% of the inhabitants of the city and by just over 18% of the rural population (Tab. 1).

**Table 1**

Most commonly purchased forms of frozen fish, depending on the area of residence

Form of frozen fish	% residents of urban areas	% residents of rural areas
Fillets	64,6	65,8
Cubes / chunks	25	18,4
Whole fish	16,7	15,8
Drawn fish	16,7	5,3

Respondents being asked to list the species of fish available in their area most frequently mentioned, in the case of frozen fish: basa fish, cod and pollock, while in the case of fresh fish: cod, herring and trout. That indicates that, when choosing fish respondents bore in mind their availability on the local market.

More than 70% of respondents living in urban areas declared that their area is characterized by large availability and a wide range of fresh and frozen fish (Tab. 1). Otherwise this situation developed in rural areas, where more than 68% of respondents said that the availability of these products in their area was poor. Almost 8% of residents of rural areas declared total lack of fresh fish in their area (Tab. 2). Conducted  $\chi^2$  test showed that there is a relationship between the area and the availability of fresh fish.

**Table 2**

A percentage comparison of availability of fresh and frozen fish, depending on area of residence and gender

Availability	Women	Men	Urban areas	Rural areas
High and wide choice	47,2	54,5	70,8	23,7
Low and poor choice	47,2	45,5	29,2	68,4
Lack of fresh fish in my area	5,6	0	0	7,9

This fact results from the lack of fish shops and poor market offer occurring in rural areas [5]. People living in those areas must settle for selected species of frozen fish, more rarely fresh fish, which are mostly available in local stores, and appear in the mobile fish trucks. Unfortunately, the goods from the sources mentioned above are available to residents usually once a week, which does not satisfy their needs. Long queues from early morning hours prove that.

On the basis of the obtained results, it was found that urban residents most frequently purchased fish in fish stores and supermarkets, respectively 44% and 37% indications. While doing shopping, inter alia in the fish store, respondents had the possibility to make the best choice of fish from wide offer of different species and forms [5]. In rural areas the most popular source of fish was mobile fish truck, which supplied almost half of respondents (47%) in fish. Over 30% of interviewees purchased fish in supermarkets, and it was usually combined with doing shopping on the way home from work. In accordance with research results by Cieřlik et al. [8] more than half of the polled purchased fish in large retail chains, whereas the

Nielsen Holdings reported that 29% of the Polish consumers purchased fish and seafood in fish stores, while 73% of Europeans strongly supported the purchase of fish at the supermarket [9, 10].

Carried out studies show that more than 70% of the respondents were satisfied with the purchase of frozen fish. This may be due to the increase in consumers' awareness on freezing, which not only guarantees the quality and freshness, but also aids enhancing food safety [11]. Respondents who were unhappy with the purchased frozen fish most often gave the following answers: "too much water/ice in relation to fish", "I do not like frozen fish, but sometimes I have no choice and I have to buy frozen fish, because fresh fish is very rare in the area," "frozen fish is not fresh".

## CONCLUSIONS

1. According to respondents' opinions on the availability of fish it appears that urban areas of Wejherowo district are characterized by high availability and wide range of fresh and frozen fish, whereas rural areas have limited access to these products.
2. Almost 8% of women living in rural areas declared total absence of fresh fish in their area.
3. Respondents living in the cities most often purchase fish in fish stores, and rural residents benefit from mobile fish trucks.

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