POLISH JOURNAL OF NATURAL SCIENCES
Abbrev.: Pol. J. Natur. Sc., Vol 32(2): 357–370, Y. 2017

EFFECT OF SOCIOECONOMIC CHARACTRISTICS OF CONSUMERS ON PREFERENCES OF PURCHASE AND CONSUMPTION OF FRESHWATER FISH

***Iwona M. Batyk*[1], *Małgorzata Woźniak*[2]**

[1] Chair of Commodity Science and Food Analysis
[2] Department of Fish Biology and Pisciculture
University of Warmia and Mazury in Olsztyn, Poland

Key words: freshwater fish, fish consumption, consumer preferences.

Abstract

This article contains results of a study the objective of which has been to identify the effect of socio-economic characteristics of consumers on: frequency of fish consumption, preferred form and place of fish purchase. Additionally, the degree to which the above properties affected fish purchase was estimated. Moreover, subjective opinions of consumers on the circumstances of fish consumption were assessed. The empirical research was conducted with a questionnaire-based interview method, and involved 184 randomly selected respondents.

The investigations justify the conclusion that socio-economic features have a statistically significant effect not only on the frequency of fish consumption and occasions when fish are consumed, but also on the preferred form and site of fish purchase as well as the determinants affecting the purchase of freshwater fish.

It has been determined that fish consumption is statistically significantly affected such characteristics as: sex, age and average monthly income of consumers. No statistically significant relationships were determined between the education of respondents and the frequency of fish consumption. The research results point to statistically significant differences in the preferred form and place of purchase related to the following factors: sex, age, education and average monthly income of respondents. The age and education level of consumers were not confirmed to have a statistically significant influence on the occasions on which fish were consumed.

WPŁYW CECH SOCJOEKONOMICZNYCH KONSUMENTÓW NA PREFERENCJE ZAKUPU I SPOŻYCIA RYB SŁODKOWODNYCH

***Iwona M. Batyk*[1], *Małgorzata Woźniak*[2]**
[1] Katedra Towaroznawstwa i Badań Żywności
[2] Katedra Biologii i Hodowli Ryb
Uniwersytet Warmińsko-Mazurski w Olsztynie, Polska

Słowa kluczowe: ryby słodkowodne, spożycie ryb, preferencje konsumenckie.

Address: Iwona M. Batyk, University of Warmia and Mazury, pl. Cieszyński 1, 10-957 Olsztyn, Poland, phone: +48(89) 524 52 09, e-mail: iwona.batyk@uwm.edu.pl

Abstrakt

W artykule zaprezentowano wyniki badań, których celem było określenie wpływu cech socjoekonomicznych konsumentów na częstotliwości spożywania ryb oraz preferowaną formę i miejsce ich zakupu. Zbadano również stopień wpływu wybranych czynników na zakup ryb. Poznano ponadto subiektywne oceny konsumentów dotyczące okoliczności spożywania ryb. Badania empiryczne zrealizowano metodą wywiadu kwestionariuszowego wśród 184 losowo wybranych respondentów.

Przeprowadzone badania pozwalają stwierdzić, że cechy socjoekonomiczne mają statystycznie istotny wpływ nie tylko na częstotliwość i okoliczności spożywania ryb, ale również na preferowaną formę i miejsce zakupu oraz determinanty wpływające na zakup ryb słodkowodnych.

Stwierdzono, że na spożycie ryb statystycznie istotnie wpływają takie cechy jak: płeć, wiek oraz średni miesięczny dochód. Nie wykazano zależności istotnej statystycznie między wykształceniem respondentów a częstotliwością spożycia ryb. Wyniki badań wskazują na statystycznie istotne różnice między preferowaną formą zakupu ryb oraz miejscem ich zakupu a: płcią, wiekiem, wykształceniem oraz średnim miesięcznym dochodem konsumentów. Nie stwierdzono statystycznie istotnego wpływu wieku i wykształcenia na okoliczności konsumpcji ryb.

Introduction

In Poland, fish is an underrated type of food and, statistically speaking, it is rarely consumed (HRYSZKO 2015). Fish as food are rich in protein, vitamins and valuable minerals (BORUCKA and WIECZOREK 2003, GAWĘCKI and HRYNIEWIECKI 2005, POLAK-JUSZCZAK 2008a, POLAK-JUSZCZAK 2008b, USYDUS and SZLINDER-RICHERT 2009, ŁUCZYŃSKA et al. 2011). Fish are easily digestible and low in calories (KOŁAKOWSKA and KOŁAKOWSKI 2001, POLAK-JUSZCZAK and ADAMCZYK 2009). Owing to the abundance of important nutrients, especially polyunsaturated fatty acids: eicosapentaenoicacid (EPA) and docosa hexaenoicacid (DHA), fish promote the proper functioning of a human organism. They reduce the risk of myocardiac infarct, neoplasms, atherosclerosis, cerebral infarction; they also lower the blood pressure and level of cholesterol (BOURRE 2005, LECERF 2009, PARK and MOZOFFARIAN 2010). Moreover, they improve memory and concentration, and are recommended to pregnant women, partly because they affect the developing brain of a child both before and after birth (CALDLER and GRIMBLE 2002, HIBBELN et al. 2007, MYERS and DAVIDSON 2007)

Compared to other food products, fish prices are constantly rising on the world market. The more noble the fish species, the higher the price. Sometimes, very high prices of certain fish species reflect consumers' preferences in more developed countries, and a considerable decrease in the supply of some species, most often predatory ones, due to overfishing. The existing price tendencies on the global fish market have led to a situation where investment into fishing and aquaculture in developing countries seems to be a particularly profitable option, helping to improve their economies (BROCKI 2009).

The factors that have substantial influence on fish consumption are: wealth of a society, tradition of eating fish, and fish availability. Fish from inland waters are different in nutritional value as well as their taste. These differences stem from environmental conditions, body weight, physicological status, time of fish catch and, above all, freshness of fish meat (PUCHAŁA 2007, STEFFENS and WIRTH 2007, GRELA at al. 2010, JABEEN and CHAUDHRY 2011, USYDUS al. 2011, TKACZEWSKA and MIGDAŁ 2012a, TKACZEWSKA and MIGDAŁ 2012b, SKAŁECKI at al. 2013).

Recent years have witnessed several campaigns promoting fish as food and fish nutritional values. The Fish Promotion Association has been set up in Poland. The intention behind such promotion of rational nutrition and dissemination of the knowledge about the role of fish as foodstuff has been to raise amounts of fish and fish products sold to consumers, and to encourage them to eat less popular fish species, such as roach or common bream. The most popular promotional campaigns in Poland have been: "Ryby – głosu nie mają zdrowia dodają", "Ryba wpływa na wszystko", "Ryby mają głos", "Mamo jedz ryby". Many projects, contests and festivals have been held to promote fish, e.g. the Regional Fish Festival, or the Masurian Fish Festival "Rybkę na zdrowie".

The article presents results of a study which was aimed at investigating the frequency and circumstances of fish consumption, preferred form and site of purchase as well as the influence of fish origin on consumer preferences concerning the determinants guiding the purchase of freshwater fish.

Materials and Methods

The results presented in this article originate from empirical research completed with the use of a questionnaire, delivered to 184 respondents. The respondents selected for the research consisted of people who buy and eat fish. Besides, the questionnaire was addressed to consumers with different socioeconomic characteristics. The data were obtained from respondents different in terms of gender, age, education and the average monthly income per family member.

The questionnaire was specifically designed by the authors and contained alternative questions, disjunctive questions (where one of several answers could be selected) and conjunctive questions (where more than one answer could be selected).

Statistical analysis of the examined characteristics was accomplished with Statistica PL software. It comprised an analysis of frequency.

The respondents consisted of groups characterized by different sex, age, education, place of residence and average monthly income per family member. More details can be found in Table 1.

Table 1

Characteristics of respondents

Socioeconomic characteristics	Specification	Percentage of respondents
Gender	female	64.1
	male	35.9
Age	to 20 years	12.0
	21–30 years	50.5
	31–40 years	18.0
	41–50 years	13.0
	more than 50 years	6.5
Education	basic	0
	vocational	0
	secondary	21.7
	higher	78.3
Place of residence	more than 100 thousand residents	50.4
	city 50–100 thousand residents	8.2
	city 10–50 thousand residents	20.1
	city for 10 thousand residents	4.9
	village	16,3
The average monthly income per person [zł/EUR]	to 800 zł/186 EUR	18.5
	801–1000 zł/186,2–232 EUR	13.6
	1001–1500 zł/233–348 EUR	22.8
	1501–2000 zł/349–465 EUR	29.9
	more than 2000 zł/465 EUR	15.2

In order to assess to what extent differences between the respondents' replies were incidental and to what extent they reflected trends in various periods of the study, appropriate statistical tests were employed. The choice of the tests depended on the nature of analyzed data, and hence comparison of the distribution of variants of answers to individual questions from the questionnaire was supported by the χ^2 test, assuming the significance level of $\alpha = 0.05$. The χ^2 test allowed us to verify some dependences between socioeconomic characteristics and frequency of fish consumption, purchase site, circumstances of fish consumption, and determinants affecting freshwater fish purchase.

Results and Discussion

Nearly half of the respondents (44.6%) declared eating fish 2 to 3 times a month, while as many as 15.2% ate fish only occasionally. One in three of the respondents (30.4%) consumed fish at least once a week (Table 2).

Table 2

The impact of socioeconomic characteristics on the frequency of fish consumption

Socioeconomic characteristics	The frequency of fish consumption			
	few times a week	once a week	two to three times a month	occasionally
	% of responses			
Total	9.8	30.4	44.6	15.2
Gender				
Women	8.5	31.4	39.8	20.3
Men	12.1	28.8	53.0	6.1
Age				
To 20 years	18.2	0	50.0	31.8
21–30 years	9.7	30.1	41.9	18.3
31–40 years	15.2	42.4	36.4	6.1
41–50 years	0	33.3	58.3	8.3
More than 50 years	0	50.0	50.0	0
Education				
Secondary	10	25.0	47.5	17.5
Higher	9.7	31.9	43.8	14.6
The average monthly income per person				
To 800 zł	11.8	32.4	29.4	26.5
801–1000 zł	0	52.0	40.0	8.0
1001–1500 zł	16.7	19.0	45.2	19.0
1501–2000 zł	12.7	20.0	54.5	12.7
More than 2000 zł	0	46.4	46.4	7.1

The study shows that 8.5% of women and 12.1% of men ate fish several times a week. There was an evident difference regarding occasional fish consumption, which was declared by 20.3% of women and 6.1% of men. Half of those questioned aged up to 20 years consumed fish 2 to 3 times a month, and over 31.8% ate it occasionally. Among the respondents aged 21–30, the largest group declared eating fish 2 to 3 times a month (41.9%) or once a month (30.1%). Among the 31–40-year-olds, the highest percentage consumed fish once a week (42.4%) or 2–3 times a month (36.4%). Over half of the people aged 41 to 50 years ate fish 2–3 times a month (58.3%). The oldest

respondents declared eating fish once a week or 2–3 times a month (50% each, respectively).

Most people with secondary and higher education consumed fish 2–3 times a month. Regarding the respondents' incomes, 52% of those earning from 801 to 1,000 PLN monthly consumed fish once a week. Most persons (54.5%) in the group with an income between 1,501 and 2,000 PLN indicated the frequency of fish consumption as 2–3 times a month. The respondents with incomes above 2,000 PLN consumed fish once a week or 2–3 times a month (46.4% each, respectively).

The study by LEBIEDZIŃSKA et al. (2006) suggests that among the students questioned, 9% of women and 18% of men declared fish consumption several times a week, whereas the survey conducted by KOŁODZIEJCZYK (2008) demonstrated that 45% of the respondents claimed they consumed fish 1–2 times a week. Only one in five students of medicine consumed fish according to rational nutrition recommendations (GAJEWSKA 2009). Nearly the same results were achieved in a study conducted among adolescents aged 14 to 18 years (BORTNOWSKA et al. 2011).

The results show that the frequency of fish consumption by Polish consumers is lower than recommended by the Polish Institute of Food and Nutrition, which in 2012 stated that fish and fish products should be consumed twice a week, including fat fish eaten once a week, to maintain good health (TKACZEWSKA et al. 2014). The analytical report drawn for the Association of Salmonid Fish Producers (2011), most adult Poles (94%) have bought fish or fish products at least once over the past year.

Based on the results of our survey, it was found that fish consumption is statistically significantly affected by such characteristics as: sex, age and average monthly income. No statistically significant relationship was identified between the respondents' education and frequency of fish consumption.

The vast majority of the respondents (72.3%) consumed fish at home and associated eating fish with festive occasions. Only 9.2% consumed fish during family celebrations, 7.6% declared fish consumption without any special occasion, 6.5% ordered fish in restaurants (Table 3). Other circumstances (4.4%) indicated by the respondents included travel to another country or region and a wish to consume fish typical of a given geographical area. Irrespective of the socioeconomic characteristics of the respondents, fish are most often consumed at home.

Despite strong culinary traditions of eating fish in Poland, currently fish are rarely found on tables in Polish households. Today, Poles most often eat fish on holidays, during special occasions, or visits to restaurants. Possible reasons are high labour inputs into cooking fish and high prices of fish.

Table 3

The impact of socioeconomic characteristics on consumers' preference of occasions for fish consumption

Socioeconomic characteristics	Occasion of fish consumption				
	at home	family get-togethers	in a restaurant	no special occasion	others
	% of responses				
Total	72.3	9.2	6.5	7.6	4.4
Gender					
Women	73.7	12.7	6.8	5.1	1.7
Men	69.7	3.0	6.1	12.1	9.1
Age					
To 20 years	50.0	18.2	22.7	9.1	0
21–30 years	74.2	6.5	5.4	9.7	4.3
31–40 years	87.9	6.1	6.1	0	0
41–50 years	66.7	12.5	0	12.5	8.3
More than 50 years	66.7	16.7	0	0	16.7
Education					
Secondary	57.5	10.0	12.5	15.0	5.0
Higher	76.4	9.0	4.9	5.6	4.2
The average monthly income per person					
To 800 zł	67.6	14.7	0	17.6	0
801–1000 zł	92.0	0	0	0	8.0
1001–1500 zł	57.1	7.1	19.0	11.9	4.8
1501–2000 zł	74.5	16.4	3.6	5.5	0
More than 2000 zł	78.6	0	7.1	0	14.3

Statistically significant effects of the sex and average monthly income per capita on the circumstances in which fish are consumed by the respondents were determined.

The ever growing pace of life means that people have less time to make dishes from fresh fish, and therefore they use frozen products, which is confirmed by our results (Table 4). Over half of the consumers questioned bought frozen fish (53.3%). The choice is dictated by the ease and speed of making dishes from frozen fish, with no need to remove fish head or viscera. Consumers who buy fresh fish (30.4%) draw attention mostly to the possibility of using all fish parts for making various dishes. The respondents were least interested in fish in gelly – only 1.1% indications, smoked fish (6.5%) and fish products (8.7%). The survey results show the lack of interest in salted fish, which may stem from the fact that an aware consumer sporadically chooses products with high salt content.

Table 4
The impact of socioeconomic characteristics on consumers' preference of the form of purchased fish

Socioeconomic characteristics	Preferred form of purchased fish				
	fresh	frozen	in gelly	smoked	processed fish products
	% of responses				
Total	30.4	53.3	1.1	6.5	8.7
Gender					
Women	27.1	65.3	0	3.4	4.2
Men	36.4	31.8	3.0	12.1	16.7
Age					
To 20 years	18.2	40.9	0	9.1	31.8
21–30 years	29.0	59.1	2.2	2.2	7.5
31–40 years	36.4	57.6	0	6.1	0
41–50 years	37.5	29.2	0	25.0	8.3
More than 50 years	33.3	66.7	0	0	0
Education					
Secondary	32.5	40.0	5.0	5.0	17.5
Higher	29.9	56.9	0	6.9	6.3
The average monthly income per person					
To 800 zł	35.3	64.7	0	0	0
801–1000 zł	24.0	68.0	8.0	0	0
1001–1500 zł	16.7	50.0	0	0	33.3
1501–2000 zł	32.7	49.1	0	18.2	0
More than 2000 zł	46.4	39.3	0	7.1	7.1

Women preferred frozen fish much more, while men more often chose fresh fish. Beside, men bought fish in gelly, smoked fish and fish products more often than women did. Frozen fish were popular among all the investigated age groups, except the 41–50-year-olds, who more often bought fresh fish. Fish in gelly was the least popular option, indicated by just 2.2% of the respondents aged 21–30 years. Smoked fish was preferred by the respondents aged 41–50 years (25%), and fish products were chosen by the youngest persons. Irrespective of their education, the respondents most often bought frozen fish, followed by fresh fish, fish products and smoked fish. All the respondents, except persons with an income over 2,000 PLN, preferred frozen fish the best, while persons with the highest income indicated fresh fish as their most preferred choice.

Also, AMAO and AYANTOYE (2014) concluded that frozen fish is easily available and does not require much labour input to be cooked. On the other hand, consumers in Nigeria preferred smoked fish (32.3%) and, to a lesser

degree, fresh fish (19.2%), while 47.5% claimed they willingly bought both fresh and smoked fish (MOSES at al. 2015).

The research results implicate statistically significant differences between the preferred form of fish purchase and the consumers' gender, age, education and average monthly income.

The questionnaire also revealed that all consumers, regardless of their sex, age, education or average monthly income of a household per capita, most often bought fish in supermarkets (40.2%), which could be stimulated by a wide range of products available in such outlets and frequent special offers. Many respondents also bought fish in discount shops (20.7%) and in fish shops (17.9%). A small percentage of those questioned bought fish directly from street vendors (9.2%), from fish farmers and producers of fish products (4.9%), in restaurants and snack bars (1.1%) – Table 5.

Table 5

The impact of socioeconomic characteristics on consumers' preference of the place of fish purchase

Socioeconomic characteristics	Preferred place of purchase fish						
	supermarkets	discount	fish shops	street market	fish farms	restaurants	caught by angling
	% of responses						
Total	40.2	20.7	17.9	9.2	4.9	1.1	6.0
Gender							
Women	39.8	21.2	23.7	6.8	5.1	0	3.4
Men	40.9	19.7	7.6	13.6	4.5	3.0	10.6
Age							
To 20 years	68.2	13.6	4.5	4.5	9.1	0	0
21–30 years	40.9	25.8	16.1	9.7	4.3	0	3.2
31–40 years	39.4	12.1	27.3	12.1	3.0	0	6.1
41–50 years	25.0	25.0	25.0	4.2	4.2	8.3	8.3
More than 50 years	16.7	8.3	16.7	16.7	8.3	0	33.3
Education							
Secondary	42.5	15.0	2.5	15.0	15.0	0	10.0
Higher	39.6	22.2	22.2	7.6	2.1	1.4	4.9
The average monthly income per person							
To 800 zł	32.4	32.4	8.8	8.8	17.6	0	0
801–1000 zł	36.0	44.0	12.0	8.0	0	0	0
1001–1500 zł	54.8	11.9	23.8	9.5	0	0	0
1501–2000 zł	30.9	18.2	21.8	10.9	5.5	0	12.7
More than 2000 zł	50.0	3.6	17.9	7.1	0	7.1	14.3

Women much more often than man (23.7% vs 7.6%) bought fish in fish shops. Men twice as often as women (13.6% vs 6.8%) purchased fish on street markets, and three times as often as women – in restaurants. Men much more often than women (10.6% vs 3.4%) declared that the fish they consumed originated from fish ponds and water bodies where they went angling. Fish shops were most often selected by persons aged 31–40 years (27.3%), with higher education (22.2%), and an average monthly income of 1,001 to 1,500 PLN (23.8%). Fish from street vendors were most often bought by respondents over 50 years old (16.7%), with secondary education (15%), and average monthly income from 1,501 do 2,000 PLN (10.9%). In turn, 33.3% of people aged over 50 years and 14.3% of those with an income over 2,000 PLN indicated that the fish they consumed originated mainly from own angling catches. A possible reason for the scanty interest in buying fish from fish farmers could be the lack of knowledge among consumers about direct sale outlets and a low availability of fish, for example on street markets. Unlike the Polish consumers questioned in our study, consumers in Turkey buy fish mostly in local shops (7.8%), on street markets (11.2%), and less often in supermarkets (9%). It is worth noticing that the fish purchased mostly originate from catches in the natural environment (76.7%) (MEHMET at al. 2015).

Our results show statistically significant differences between the place where fish is purchased and all the analyzed socioeconomic properties.

The most important factor determing the purchase of fish is its freshness (94%), a finding supported by some earlier studies (KRAFT and ZABROCKI 2010, TKACZEWSKA et al. 2014). Other significant determinants of fish purchase are: palatability (91.9%), appearance (81.0%), nutritive value (64.1%), price (52.7%) and habits (50%). The consumers described as less important such characteristics as: ease of cooking (33.7%), special offers (26.6%), origin of fish (16.3%) or fashion (1.1%) – Table 6.

Significant differences were determined between the answers provided by men and women with respect to factors affecting fish purchase. Women ascribed much greater importance to: price (women – 64.4%, men – 31.8%), nutritive value (69.5% vs 54.5%) and appearance (85.6% vs 72.7%). For men, such qualities as easy cooking (men – 45.5%, women – 27.1%) and taste (97% vs 89%) were more important.

Regardless of the level of education and for all respondents aged up to 40 years, the principal determinants of fish purchase were: freshness of fish, their taste and appearance. The age group of 41 to 50 pointed to appearance (100%), taste (91.7%) and freshness (87.5%), while the oldest age group indicted: taste and habits (100% each, respectively) and appearance (83.3%).

Among the respondents with the lowest incomes, the most important determinants were: freshness of fish (91.2%), appearance (85.3%) and price

Table 6

The impact of socioeconomic characteristics on consumers' preference of the determinants of fish purchase

Socioeconomic characteristics	Level of influence	Factors which determine the purchase of fish									
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
		% of responses									
Total	strong	52.7	91.8	64.1	94.0	33.7	81.0	50.0	1.1	26.6	16.3
	no impact	7.1	0	3.3	0	11.4	2.2	7.6	84.8	20.1	35.9
Gender											
Women	strong	64.4	89.0	69.5	94.9	27.1	85.6	48.3	0	28.0	18.6
	no impact	4.2	0	0	0	8.5	0	4.2	83.1	16.9	31.4
Men	strong	31.8	97.0	54.5	92.4	45.5	72.7	53.0	3.0	24.2	12.1
	no impact	12.1	0	9.1	0	16.7	6.1	13.6	87.9	25.8	43.9
Age											
To 20 years	strong	18.2	100	72.7	100	31.8	72.7	63.6	0	0	27.3
	no impact	9.1	0	0	0	9.1	9.1	0	90.9	27.3	18.2
21–30 years	strong	61.3	86.0	66.7	96.8	34.4	79.6	28.0	2.2	30.1	16.1
	no impact	6.5	0	2.2	0	16.1	2.2	11.8	76.3	22.6	44.1
31–40 years	strong	48.5	100	72.7	93.9	21.2	75.8	66.7	0	15.2	27.3
	no impact	0	0	0	0	6.1	0	9.1	93.9	9.1	21.2
41–50 years	strong	54.2	91.7	50.0	87.5	54,2	100	75.0	0	45.8	0
	no impact	20.8	0	12.5	0	0	0	0	100	16.7	50.0
More than 50 years	strong	58.3	100	33.3	75.0	25.0	83.3	100	0	41.7	0
	no impact	0	0	8.3	0	16.7	0	0	83.3	25.0	16.7
Education											
Secondary	strong	37.5	100	67.5	87.5	40.0	77.5	52.5	0	12.5	20.0
	no impact	5.0	0	0	0	5.0	5.0	12.5	90.0	20.0	22.5
Higher	strong	56.9	89.6	63.2	95.8	31.9	81.9	49.3	1.4	30.6	15.3
	no impact	7.6	0	4.2	0	13.2	1.4	6.3	83.3	20.1	39.6
The average monthly income per person											
To 800 zł	strong	79.4	76.5	79.4	91.2	29.4	85.3	23.5	0	29.4	5.9
	no impact	5.9	0	0	0	14.7	0	8.8	94.1	11.8	41.2
801–1000 zł	strong	76.0	100	40.0	88.0	44.0	84.0	52.0	8.0	28.0	40.0
	no impact	0	0	8.0	0	8.0	8.0	16.0	84.0	16.0	24.0
1001–1500 zł	strong	42.9	88.1	78.6	100	33.3	66.7	57.1	0	23.8	21.4
	no impact	0	0	0	0	4.8	4.8	2.4	81.0	14.3	26.2
1501–2000 zł	strong	29.1	100	65.5	100	36.4	92.7	52.7	0	21.8	7.3
	no impact	10.9	0	7.3	0	5.5	0	3.6	78.2	23.6	49.1
More than 2000 zł	strong	60.7	92.9	42.9	82.1	25.0	71.4	64.3	0	35.7	17.9
	no impact	17.9	0	0	0	32.1	0	14.3	92.9	35.7	28.6

Key: *1* – price, *2* – taste, *3* – nutritional values, *4* – freshness, *5* – easy to prepare, *6* – appearance, *7* – habits, *8* – fashion, *9* – promotion, *10* – the place of origin of fish

(79.4%). For the persons in the income brackets of 1,001 and 1,500 PLN monthly, the most important qualities of fish were: freshness (100%), taste (88.1%) and nutritive value (78.6%). Respondents with incomes between 1,501 and 2,000 PLN drew attention to: freshness and taste (100% each), as well as appearance (92.7%), while the people earning monthly incomes over 2,000 PLN were mostly interested in: taste (92.9%), freshness (82.1%) and appearance (71.4%).

LEBIEDZIŃSKA et al. (2006) concluded that students making a decision about fish purchase were guided mainly by the fish taste (89% of women and 92% of men) and freshness (66% of women and 70% of men). Subsequently, female students considered the effect of fish on health and its nutritive value. Male students paid attention to the price and appearance of fish

The origin of fish did not play any larger role as a determinant of fish purchase. It would be advisable to emphasize the importance of fish origin in future campaigns promoting fish consumption. It is vital that consumers pay attention to a fish catch area or a fish farm from which the fish they consume originate because research has confirmed that a site of freshwater fish breeding and rearing as well as applied aquaculture techniques have an influence on fish meat quality characteristics (TKACZEWSKA and MIGDAŁ 2012a, 2012b).

The results of our study demonstrate that the vast majority of respondents (73.4%) was ready to pay more for fish originating from Poland.

Statistically significant differences were shown between certain socioeconomic characteristics of consumers and determinants of consumer purchases of freshwater fish (Table 7).

Table 7

Statistically significanty relationship between consumer socio-economic characteristics and determinants affecting the purchase of freshwater fish

Determinants of affecting the purchase of fish	Gender	Age	Education	The average monthly income of person
Price	X	X	X	X
Palatability	–	–	–	X
Nutritional values	X	X	–	X
Freshness	–	–	–	–
Easy to prepare	X	–	–	X
Apperance	X	–	–	X
Habits	X	X	–	X
Fashion	–	–	–	X
Promotion	–	X	–	–
The place of origin of fish	–	X	–	X

X – statistically significantly relationships

Conclusions

Our analysis of the survey results justifies the claim that the Polish consumer puts fish on the menu far too rarely. The respondents admitted to consuming fish dishes mostly at home, and often on special occasions, like holidays or family celebrations.

Consumers purchased mainly frozen fish and made their purchase in chain shops or discount shops. While buying the fish, the respondents mostly paid attention to: freshness, appearance and taste values. The price was not a key determinant, which may suggest a high awareness of consumers in terms of the pre-defined attributes.

Unfortunately, the respondents did not pay sufficient attention to the place of origin of fish, which to a large extent can affect the perception of a product quality, its freshness and organoleptic characteristics. At the same time, they demonstrated an ethocentric attitude, indicating the preference for buying local, regional and national products with native origin.

Translated by Jolanta Idźkowska

Accepted for print 3.02.2017

References

Amao J.O., Ayantoye K. 2014. *Consumer preference and consumption pattern for selected forms of fish in Oyo Stae, Nigeria.* Inter. J. Sci, Environ., 3(3): 841–860.

Bortnowska G., Grotowska L., Goluch-Koniuszy Z. 2011. *Spożycie potraw i/lub przekąsek rybnych przez młodzież szkolną z Pojezierza Międzychodzko-Sierakowskiego.* Roczn. PZH, 62(3): 325–333.

Borucka I., Wieczorek C. 2003. *Ryby i bezkręgowce morskie w technologii gastronomicznej*. In: *Podstawy technologii gastronomiczne.* Ed. S. Zalewski, pp. 536.

Bourre J.M. 2007. *Dietary omega-3 fatty acids for women*. Biomed. Pharmacot., 61: 105–112.

Brocki W. 2009. *Odpowiedzialne rybołówstwo jako element zrównoważonego rozwoju*. Szczecin, pp. 74–93.

Calder P.C., Grimble R.F. 2002. *Polyunsaturated fatty acids, inflammation and immunity*. Eur. J. Clin. Nutr., 56: 14–19.

Gajewska M., Ostrowska A. 2009. *Zróżnicowanie spożycia ryb morskich przez studentów dwóch wydziałów Warszawskiego Uniwersytetu Medycznego.* Bromat. Chem. Toksykol., XLII(2): 131–136.

Gawęcki J., Hryniewiecki L. 2005. *Żywienie człowieka. Podstawy nauk o żywieniu.* Wyd. Nauk. PWN, Warszawa.

Grela E., R., Pisarski R., K., Kowalczuk-Vasilev E., Rudnicka A. 2010. *Zawartość składników odżywczych, mineralnych i profil kwasów tłuszczowych w mięsie wybranych gatunków ryb w zależności od terminu odłowu.* Żyw. Nauk. Tech. Jakość, 4(71): 63–72.

Hibbeln J.R., Davis J.M., Steer C., Emmett P., Rogers I., Williams C., Golding J. 2007. *Maternal seafood consumption in pregnancy and neurodevelopment outcomes in childhood (ALSPAC study): an observation cohort study.* Lancet, 369: 578–585.

Hryszko K. 2015. *Rynek Ryb. Stan i perspektywy*, Warszawa

Jabeen F., Chaudhry A.S., 2011. *Chemical compositions and fatty acid profiles of three freshwater fish species*. Food Chemistry, 125: 991–996.

KOŁAKOWSKA A., KOŁAKOWSKI E. 2001. *Szczególne właściwości żywieniowe ryb*. Przem. Spoż., 6: 10–13.

KOŁODZIEJCZYK M. 2007. *Spożycie ryb i przetworów rybnych w Polsce. Analiza korzyści i zagrożeń*. Roczn. PZH, 1: 287–293.

KOŁODZIEJCZYK M. 2008. *Wyniki badań preferencji nabywczych i wiedzy żywieniowej konsumentów ryb i ich przetworów*. Mag. Prz. Ryb., 6: 32–34.

KREFT A., ZABROCKI R. 2010. *Postawy i zachowania konsumentów Trójmiasta na rynku karpia*. Zeszyty Naukowe Akademii Morskiej w Gdyni, 65: 51–60.

LEBIEDZIŃSKA A., KOSTRZEWA A., RYŚKIEWICZ J., ŻBIKOWSKI R., SZEFER P. 2006. *Preferences, consumption and choice factors of fish and seafood among university students*. Pol. J. Food Nutr. Sci., 15/56(1): 91–96.

LECERF J.M. 2009. *Fatty AIDS and cardiovascular disease*. Nutr. Rev., 67: 273–283.

ŁUCZYŃSKA J., TAŃSKA E., BOREJSZO Z. 2011. *Zawartość makro- i mikroelementów oraz kwasów tłuszczowych w mięśniach łososia (Salmo salar* L.*), pstrąga tęczowego (Oncorhynchus mykiss* Walb.*) i karpia (Cyprinus carpio* L.*)*. Żyw. Nauk. Tech. Jakość, 3(76): 162–172.

MEHMET F.C., AYTEKIN G., HAYRIYE Y.C. 2015. *Fish consumption preferences and factors influencing it*. Food Sci. Technol. (Campinas), 35(2), doi.org/10.1590/1678-457X.6624.

MOSES J.D., DANIEL A.D., GIROH D.Y., ZALKUWI J., AKINDELE O. 2015. *The influence of socio-economic characteristics on consumers' preference on fish purchase in Yola North Local Government Area, Adamawa State*. Inter. J. Environ. Agricult. Res., 1(7): 1–11.

MYERS G.J., DAVIDSON P.W. 2007. *Maternal fish consumption benefits children's development*. Lancet, 369: 537–538.

PARK K., MOZOFFARIAN D. 2010. *Omega-3 fatty acids, mercury, and selenium in fish and risk of cardiovascular diseases*. Curr. Atheroscler Rep., 12: 414–422.

POLAK-JUSZCZAK L. 2008a. *Zawartość składników mineralnych w rybach wędzonych*. Roczn. PZH, 59(2): 187–196.

POLAK-JUSZCZAK L. 2008b. *Składniki mineralne w wybranych gatunkach ryb z Zalewu Wiślanego*. Bromat. Chem. Toksykol., XLI(3): 858–861.

POLAK-JUSZCZAK L., ADAMCZYK M. 2009. *Jakość i skład aminokwasowy białka ryb z Zalewu Wiślanego*. Żyw. Nauk Tech. Jakość, 3(64): 75–83.

PUCHAŁA R. 2007. *Wpływ żywienia na skład chemiczny mięsa karpia*. Inż. Rol., 5(93): 363–368.

Ryby i produkty rybne – terminologia. PN-A-86770:1999.

SKAŁECKI P., FLOREK M., LITWIŃCZUK A., STASZEWSKA A., KALINIAK A. 2013. *Wartość użytkowa i skład chemiczny mięsa karpi (Cyprinus carpi* L.*) i pstrągów tęczowych (Oncorhynchus mykiss* Walb.*) pozyskanych z gospodarstw rybackich regionu lubelskiego*. Rocz. Nauk. Pol. Tow. Zoot., 9(2): 57–62.

STEFFENS W., WIRTH M. 2007. *Influence of nutrition on the lipid quality of pond fish: common carp (Cyprinus carpio* L.*) and tench (Tinca tinca)*. Aquacult. Int., 15: 313–319.

TKACZEWSKA J., MIGDAŁ W. 2012a. *Porównanie wydajności rzecznej, zawartości podstawowych składników odżywczych oraz poziomu metali ciężkich w mięśniach karpi (Cyprinus carpio* L.*) pochodzących z różnych rejonów*. Żyw. Nauk. Tech. Jakość, 6(85): 180–189.

TKACZEWSKA J., MIGDAŁ W. 2012b. *Porównanie wydajności rzecznej, zawartości podstawowych składników odżywczych oraz poziomu metali ciężkich w mięśniach pstrągów tęczowych (Oncorhynchus mykiss) pochodzących z różnych rejonów Polski*. Żyw. Nauk. Tech. Jakość, 5(84): 177–186.

TKACZEWSKA J., MIGDAŁ W., KULAWIK P. 2014. *Preferencje konsumentów w zakresie spożycia ryb*. Komun. Ryb. 1(138): 10–14.

USYDUS Z., SZLINDER-RICHERT J. 2009. *Jod i fluor w produktach rybnych*. Bromat. Chem. Toksykol., XLII(3): 822–826.

USYDUS Z., SZLINDER-RICHERT J., ADAMCZYK M., SZATKOWSKA U. 2011. *Marine and farmer fish in the Polish market. Comparison of the nutritional value*. Food Chem., 126: 78–84.