

Evaluation of purchasing behaviour of canned-fish consumers (Case study: Tehran City, Iran)

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ABSTRACT

Fish and its products play an important role in human health by containing an excellent source of major nutrients, especially proteins, vitamins and minerals. This study is designed to provide information for the fish canning industry to better attract more consumers for purchasing fish can. By completing a questionnaire from 300 households in 22 areas of Tehran, Iran the amount and behaviour of canned fish consumption were investigated. After analysing the descriptive and inferential results of nonparametric statistics, the hypotheses of the study were also tested. In this study, factors affecting the canned fish purchase were identified and main preferences were identified. Taste, odor, the health of cans, and standard badge exhibit the highest rates, however, the main priorities of canned fish purchase at this time have been the brand name, taste and odor, as well as the composition of contents in canned goods by consumers in Tehran. They are most interested in canned tuna in oil, then canned salmon and trout, however, they prefer now canned tuna in oil, canned tuna with Anethum and tuna salad. Among the commercial names of canned fish, Tohfe, Shilton and Oila were the first three priority brands. The majority of canned fish consumers in Tehran are considered fresh fish more superior to canned fish in terms of health and quality and are more concerned about canned fish than fresh ones. However, consumption of canned fish in Tehran are 8 cans per capita, while the consumption rate of fresh ones is about 2 kg per capita, which is very low, and needs to be taken into consideration. Therefore, the goal of producers should be focused on the taste and composition of canned fish as well as on the production and market of canned tuna in oil.

Keywords. Consumer behaviour, Canned fish, Marketing, Fishery product, Iran.

Article type: Research Article.

INTRODUCTION

For human beings, food is a critical contributor to physical wellbeing, a major source of pleasure, worry and stress, a major occupant of waking time and, across the world, the single greatest category of expenditures (Rozin *et al.* 1999). Seafood is a source of essential nutrients, particularly high-quality protein, retinol, vitamin D, vitamin E, iodine, selenium and the essential long-chain omega-3 polyunsaturated fatty acids. However on the other hand, seafood may also be contaminated with components present in the aquatic environment such as micro-organisms, algae bio-toxins, and chemicals (for example methyl mercury, dioxins and polychlorinated biphenyls (Jacobs *et al.* 2015). Fish and seafood are widely accepted to be an essential component of a balanced and healthy diet, since they have a low fat content and provide high quality proteins as well as many micronutrients such as vitamins and minerals (Carlucci *et al.* 2015). Fish spoilage results from three basic mechanisms: Enzymatic autolysis, oxidation and microbial growth. Autolytic enzymatic spoilage: Shortly after capture, chemical and biological changes take place in dead fish due to enzymatic breakdown of major fish molecules (Ghaly *et al.* 2010). According to fisheries products features for fish packaging, the two-layers, three-layers and aluminium-layer tins are used (Adeli 2013). Dietary patterns in most countries depend on races, genders, social classes, cultures, and geographies (Mirmiran

et al. 2013). Marketing managers should have a high knowledge from customer behaviour (Safarzadeh 2011). Therefore, we need comprehensive and up-to-date information about consumers' attitudes towards fish, and especially the factors that are very important indicators in guaranteeing consumers' needs when buying and consuming materials monthly (Cardoso *et al.* 2013). Different types of canned fish are produced around the world according to the taste of each country. However in Iran, the variety of canned fish is not expanded. A study by Adeli *et al.* (2011) showed that in Tehran the consumption of fish per capita is 13.3 kg, so that 6.4 kg is farmed fish, 5.8 kg wild fish and 1.1 kg canned fish. Customers in the largest fish market in Tehran also consumed 9.8 kg fish per capita, and trout, cod in addition to salmon were their favourite fish (Alidoosti *et al.* 2020). The results of Rahmawaty *et al.* (2013) investigation illustrates that trout, canned fish and shrimp are the most common seafood in Australia. In recent years, many investigations are conducted about fish and fisheries products customer behavior in international scale exhibiting that age, gender, education level, number of family members, taste, nutrition value and consumer experience are effective factors in fish consumption (Myrland *et al.* 2000; Trondsen *et al.* 2004; Verbeke & Vackier 2005). However, there are not so many investigations in different products customer behavior in Asia included Malaysia, China, Indonesia, India, Sri Lanka and Bangladesh (Suroto *et al.* 2013). In addition, investigations about canned fish markets are limited (Castro *et al.* 2016; Zaeema & Hassan 2016). Since there are 135 canned fish factories with an annual production of 727 million cans in Iran (IFO 2019), it seems that by research and development about market demands and making varieties in canned market, it is possible to increase the demand for canned fish and attract people to canned fish. Moreover, this changing in people attitude could increase annually consumption of fish and would be a great contributor in people health and even would efficiently help to fisheries economics in the country. Investigation aimed at acknowledge of preferences and canned fish consumer behavior and evaluating the role of canned fish in customer food basket in Tehran. So that the results of the research will be a guide for producers and researchers of seafood marketing to be aware of the needs of consumers and produce their desired product. In this study, in addition to presenting the production capacity view and demand for canned fish, given to the production of about 1,300,000 tons fish in Iran, it can be considered as a research to study cultural tastes of canned fish consumers in all parts of the world to obtain information on export and import potentials.

MATERIALS AND METHODS

This research is a descriptive and survey study that has been conducted in Tehran. In addition to searching for library resources to identify factors affecting canning consumption, interviews were conducted with consumers to design and complete a questionnaire. In designing the questionnaire, samples of foreign questionnaires were modeled and adapted to Iranian consumer culture. A questionnaire including sociological information and questions related to the research objectives was designed. After determining the validity by completing 30 questionnaires, its validity was obtained by calculating Cronbach's alpha coefficient of 91%. The number of statistical samples of Cochran's formula was 266. In practice, a questionnaire was completed from 300 households consuming canned fish separately and in proportion to the population in the 22 districts of Tehran. SPSS 22 software was used for statistical analysis. Descriptive statistics, including: frequency percentage, mean and standard deviation and for nonparametric statistics in inferential analysis of the research, Friedman as well as Chi-square and scoring method were used. All statistical tests of this study were considered as two-domain hypotheses and tests at a significant level of 5% (Shirazi & Saebi 2002).

RESULTS

Of the respondents, 35% (105 people) were male and 65% (195 people) female. According to chart 1, the average age of the respondents was about 39 years. Employees with government jobs with 33.3% frequency were the majority of the statistical sample. More than half (51.7%) of the statistical sample consisted of people with a bachelor's degree. The field of study of the majority of them (88%) was other than fisheries and agriculture. Single people with 24% frequency were a small part of the statistical sample. The majority of the statistical sample was related to 3-person households with 35% and then 4-person with 30%. The average of family members was 3 people. The majority of canned fish consumers have very little inclination to eat fish, so that 69.3% (about 70%) buy fish less than twice a year. In addition, about 50% of households that consume canned fish, buy less than 2 kg fish at a time. Consumption of non-canned fish consumers per capita in Tehran was 2.55 kg. The majority of respondents (about 40%) consume between 10 and 20 canned fish a year. The results show that the average annual

consumption of canned fish among households in Tehran was 24. Per capita consumption of canned food among households consuming fish was 1.48 kg. The last time canned fish was consumed in the majority of households (70%) was less than a month ago. The majority of households consuming canned fish (74.7%) choose canned 180 g (Fig. 1).

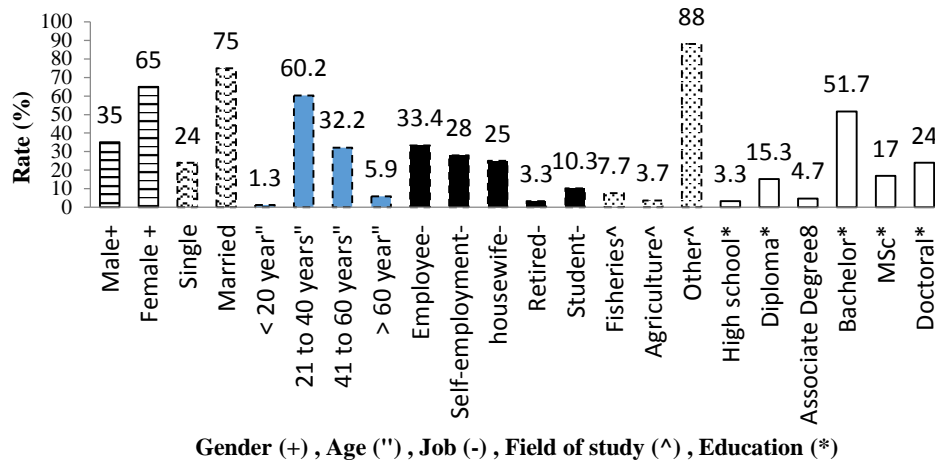


Fig. 1. Sociological characteristics of canned fish consumers (n = 300).

Table 1. Priority of preference of canned fish brand preferred by consumers.

Brand	Frequency of priority				Score	Rank
	1	2	3	4		
Shilaneh	19	24	21	18	208	6
Shilton	58	55	42	39	520	2
South Tuna	30	26	53	40	344	5
Tohfeh	99	54	43	28	672	1
Famila	27	63	30	31	388	3
Bandar Abbas	15	11	16	14	139	7
Delpazir	4	6	7	4	52	8
Oila	38	37	39	24	365	4
Shabab	3	7	7	2	49	9
Galaxy	2	1	2	2	17	11
Kadus		1	1	4	9	13
Ilika		2	4	1	15	12
Bijan		2			6	14
Meshkat			1	2	4	15
I and I	5	1	1	2	27	10

* In this table, Friedman test was used to evaluate the prioritization of different types of canned fish products based on consumer interest. The value of the test statistic with p-value less than 0.001 was 779,427, which shows the difference in prioritization of different types of canned fish products.

According to Table 1, the top four priorities of Tehran canned fish consumers among the 17 canned fish brands were Tohfeh brands, Shilton, Famila and Oila. The first three priorities in the oil used in canned fish based on consumer interest is related to ordinary oil with a frequency of 67%, soybean oil 43%, and sesame oil 41%. In Table 2, prioritization of canned fish products according to the interest of Tehran canned fish consumers showed that the most important of them are canned tuna in oil, canned tuna with Dill plant and canned tuna salad.

Table 2. Prioritization of types of canned fish products based on consumer interest.

Canned type	Mean rank	Rank
Canned tuna in salt water	6.14	4
Canned tuna in oil	3.33	1
Canned pepper	6.56	6
Canned tuna with beans	6.42	5
Canned tuna with Dill plant	5.71	2
Canned tuna salad	6.06	3
Canned tuna with garlic	8.67	12
Canned smoked tuna	7.27	9
Canned smoked Kilka	8.19	11
Canned sardines	7.72	10
Canned silver carp	11.15	13
Canned trout	6.7	7
Canned salmon	7.06	8

In Table 2, Friedman test was also used to prioritize the various factors influencing the purchase of canned fish by consumers. The value of the test statistic with p-value less than 0.001 was 1.96, which shows the difference in prioritization of different types of canned fish products. So the most important priority factors affecting the purchase and consumption of canned food included brand, taste, and the composition of canned food contents respectively.

Table 3. Prioritization of effective factors in canned fish consumers purchasing behavior in Tehran.

Factor	Mean rank	Rank	Factor	Mean rank	Rank
Brand	5	1	Canned fish species	14.88	14
Price	9.91	6	Canned weight	16.12	18
easy availability	10.81	9	Color and one piece of meat	12.25	11
Ease of use and consumption	9.84	5	Standard badge	10.22	7
Composition of canned contents	8.62	3	Can health (no bloating and rust)	9.76	4
Place of production or factory	12.11	12	Consumption history	13.59	13
Insert nutritional value	10.6	8	Lack of access to fresh fish	16.49	20
Taste and odor	5.01	2	Have a user guide	16.45	19
Can shape (round or rectangular)	14.05	14	Interest in canning	17.2	23
The color of the can	16.59	21	Having hygienic packaging	14.88	16
Put the can in the cardboard box	14.57	15	Sales advertising	18.72	25
Made and produced in Iran	11.1	10	Advice to children	17.02	22
Production and manufacture abroad	18.58	24			

Based on the results obtained from the chi-square test, the majority of canned fish consumers (39.3%) at a significant level of $p < 0.05$, canned fish is superior to non-canned fish in terms of health and quality. The majority of canned fish consumers (37.3%) were more concerned about canned fish than fresh fish, however, the results showed that canned fish enthusiasts were less interested in fresh fish.

DISCUSSION

Consumers of canned fish in Tehran consume very little fish. The per capita aquatic consumption in Tehran was 3.53 kg. Meanwhile, in Sari, northern Iran the per capita fish consumption of the citizens was 9.5 kg (Hosseini *et al.* 2016). It was 1.56 kg in Mashhad (Yousefi & Shariati 2009), 5.81 kg in Markazi Province (Dadgar *et al.* 2014), 10.6 kg in Isfahan (Zahiri 2015) and 13.6 kg in Gorgan (Aliabadi *et al.* 2014). In addition, as a result of a research conducted in 2011 in Tehran, it was reported to be 13.3 kg (Adeli *et al.* 2011). The reason for the difference between the results of this study and other researches is that the statistical population of the present study was

canned fish consumers, while in other researches the whole citizens of that city or province and fish consumers were studied and in this study, before completing the questionnaires, the respondents were asked whether they consume canned fish or not. Therefore, it can be concluded that canned fish consumers have a small share of fish consumption and their low interest in this field requires special marketing strategies to promote their fish consumption and should be looked at more specifically. Therefore, the results of this research are valuable due to the suggestions for the supply and marketing of canned fish to the industry according to the needs of consumers. In this study, in spite of targeting factories to produce the desired canned fish and customers' priority for greater efficiency and profit, showed that fish market strategies should be separate for canned fish consumers from fresh fish ones. In fact, this study has shown that those interested in consuming canned fish are not well interesting in consuming fresh ones. According to other research conducted in Iran, consumers of fresh fish are in separate categories from consumers of canned fish, and do not follow the same purchase behavioral pattern. According to the information obtained from this study, the per capita consumption of canned fish in Tehran was 1.48 kg, whereas in 2011, it was 1.1 kg (Adeli *et al.* 2011). Also, 98.8% of the surveyed households in Gorgan in 2010 had canned fish in their shopping cart (Aghili *et al.* 2010). In the United States, meanwhile, per capita consumption of canned fish increased from 1.3 kg in 1910 to about 1.7 kg in 2015, of which about one kg is canned tuna and the rest is from other aquatic animals (FUS 2015). In a study conducted in 7 EU countries, the consumption of canned fish was estimated at 2.2 kg (Dionisi & Oldring 2002). In Spain, 2.24 kg per capita was canned tuna and 2.2 kg canned other aquatic fish (Statista, 2017). In addition, according to the FAO in the Philippines, canned fish is the first priority of consumers among fishery products (Needham & Funge-Smith 2015). According to the results of this study, canned fish brands Tohfeh, Shelton and Famila are the top three priorities between Tehran consumers. In Indonesia, Canned tuna with Alliance (68.8%), Deho (62.15%) and Citra Raja (62.15%) are the top three consumer priorities, while in the Philippines, canned tuna Ocean, Celebs and Pacific Food are the top ones (Mitchel 2015). Zaeema & Hassan (2016) considered future research to include product characteristics including canned tuna flavors such as canned tuna in sunflower oil, tuna in olive oil and salt water. In the present study it was found that canned tuna in oil, canned tuna and canned tuna salad are among the priorities for canned fish in Tehran. Branding, taste, and composition of canned contents were the main priorities for Tehran citizens choosing canned food, however in a recent study in the Philippines, which is considered to be the largest producer of canned tuna, price, packaging shape, environmental labeling and weight of canned fish are the most important factors in buying canned fish (Castro *et al.* 2016). Story & Stang (2005) reported in their study that one of the most important factors for food selection as a priority, is the taste. In Iran, very little research of this type has been done sporadically. Awareness of the nutritional value and variety of fishery products can be effective in increasing consumption (Rostami 2001). Rostami (2001) and Saeedi (2004) considered the inclusion of the time of production, having a health code and a valid label as packaging priorities. They reported that those consumers who did not show a desire to consume packaged products, stated that the reason was the lack of confidence in the freshness and health of the fish and its high price, which built trust in the performance of the duties of responsible and controlling bodies such as the organization. Veterinary medicine and building on quality standards of processing and packaging can be effective in changing consumer perceptions. Adeli & Shabanpour (2007) also showed the priority for Tehran households on packaged aquatic animals and its characteristics, respectively, followed by the inclusion of aquatic nutritional value information, ability to increase product shelf life, production time information, health code, brand, a guide on how to cook, easy to open, no need to clean and ready for cooking and finally easy to carry, While regarding the preference of Tehran households in consuming packaged products (62.3 percent), it shows the problems of living in the metropolis of Tehran and accepting the consumption of packaged fish due to the culture of the residents of the region. In addition, it seems that by the production of packaging products with different weights, inserting the nutritional value of the product on the packaging, preparation of packaging with easier handling and longer storage, it can play a role in increasing consumption in this area. The results of research in East Azerbaijan also indicate that the taste of fish, the smell of fish, learning to cook, proximity to the place of sale and attractiveness, time spent on shopping, customer feedback, seller's attitude and customer familiarity with different types of fish, including factors affect the amount of fish consumption (Elhaida 2007). Aghili *et al.* (2010) acknowledged that the presence of information on packaging such as nutritional value, health code label, longer shelf life, ease of opening packaging, information on how to cook, ease of transport and transport and readiness, in order of priority their preferences are considered to indicate the acceptance of the culture of packaging consumption, while in a study on the per capita consumption of fish in

Tehran in 2011, the majority of buyers have been declared that packaging and insertion nutritional value have the highest priority (Adeli *et al.* 2011). A study conducted by Adeli *et al.* (2010) to identify the factors affecting the behavior of home consumers in four different groups of Tehran households showed that quality, taste, smell and protein source are the main factors of buying and consuming fish in Tehran households. In the present study, which was specifically conducted on canned fish consumers, the results showed that the most important factors influencing the purchase of canned fish among the Tehran consumers are taste, canned health and standard mark, while being foreign. Canned fish, children's advice and the color of canned fish are of little importance among consumers and this shows that consumers of canned fish in Tehran are more inclined to domestic canned fish than imported ones. Also, the majority of respondents with slightly different people believe that fresh fish is superior to canned fish in terms of health, but they are still interested in canned food and their consumption of fresh fish is very low. In the present study, 94% of the total respondents considered the effect of taste on the consumption of canned fish to be high and very high, 85% of the statistical population considered the effect of canned health (bloating and rust) on the behavior of canned fish to be high. They rated it very highly and 81% of the respondents considered the standard mark to be effective on canning consumption behavior. In addition, the importation of canned fish, the color of the can and the weight of the canned food were declared to be the least important factors on the buying behavior. On the other hand, Bahraini *et al.* (2013) reached different results, so that in a study in Bushehr Province, southern Iran on the effect of packaging quality on the behavior of canned-food consumers, the effect of packaging quality and color on consumer behavior have been overestimated. Therefore, Zaeema & Hassan (2016) considered characteristics such as taste, packaging and nutritional value of canned tuna as the most important factors influencing the purchase of its various brands in the Maldives.

CONCLUSION

In general, the results of all research on consumers of fish and fishery products show that consumers complain about the smell of fish, the time spent cooking and the difficulty of cooking fish. They declare that canned fish does not have these problems. In addition, in this study particularly it was found that consumers of canned fish have a very low tendency to consume fish, due to the above factors. This is why we should adopt strategies to increase consumption for such consumers and should take special measures separate from consumers only fish and pay special attention to their behaviors. Therefore, specific research on consumer behavior of each type of seafood can provide better strategies for the sustainability of production and customer retention of that product. This research recommends that in marketing and behavior studies of fish consumers, fresh fish enthusiasts be investigated separately versus those interested in processed and packaged fishery products, such as canned fish. So that, strategies can be tended to micro-marketing specific to different categories in terms of purchasing orientation, culture, race, etc. to achieve more benefits for producers with targeted sales.

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