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Determining Consumers' Choices for Fish Using Conjoint Analysis: A Pilot Study in Turkey[1]

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Abstract

The emphasis of this study is to investigate, the relative importance of different attributes (fish type, production method, place of purchase and price) on consumer perception for the fish purchase decision-making process. The data employed in this paper were taken from a face to face cross-sectional survey conducted with 526 individuals in the biggest cities (İstanbul, Ankara, İzmir, Trabzon, Adana, Van, and Gaziantep) of the seven regions of Turkey during the period July-September 2018. The questionnaire was consisting of two parts; questions on socio-demographic characteristics of the sample and the choice card. The data were analyzed using descriptive statistics, and conjoint analysis by SPSS© 21. Results show that with regard to consumer perception, place of purchase is the most important product attribute for choosing fish. The importance is line-up as price, production method and fish type. Within the place of purchase options most preferred one is the fish markets. They also prefer wild fish, sea bass and logically minimum price level compared with the designated alternatives.

Keywords: *consumer choice, conjoint analysis, fish consumption, survey, Turkey.*

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Tüketicilerin Balık Satın Alma Tercihlerinin Konjoint Analizi Kullanılarak Belirlenmesi: Türkiye Üzerine Bir Pilot Çalışma

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Öz

Bu araştırmanın amacı, balık seçiminde karar sürecini etkileyen farklı ürün özelliklerinin (balık çeşidi, üretim yöntemi, satın alma yeri ve fiyat) tüketici tercihi üzerindeki etkisini araştırmaktır. Araştırmada yararlanılan veriler, Türkiye'nin yedi bölgesinin merkez şehirlerinde (İstanbul, Ankara, İzmir, Trabzon, Adana, Van ve Gaziantep) 526 kişi ile Temmuz-Eylül 2018 döneminde yapılan yüz yüze bir anket çalışmasından elde edilmiştir. Anket örneklemin sosyo-demografik özellikleri ile ilgili sorular ve tercih kartı şeklinde iki kısımdan oluşmaktadır. Elde edilen veriler tanımlayıcı istatistikler ve konjoit analizi kullanılarak SPSS © 21 istatistiki analiz programı ile analiz edilmiştir. Sonuçlar, tüketici algısı ile ilgili olarak, satın alım yerinin balık seçiminde en önemli faktör olduğunu göstermektedir. Önem sırasına göre balık tercihinde etkili olan diğer faktörler ise fiyat, üretim yöntemi ve balık çeşididir. Satın alım yeri alternatifleri arasından ise en çok tercih edilen balık pazarları (halleri) olmaktadır ve bunu sırasıyla semt pazarları ve süpermarketler takip etmektedir. Ayrıca tüketiciler deniz balığını çiftlik balığına, levreği ise çipuraya tercih ederlerken satın alımlarını minimum fiyat düzeyinde yapmayı istemektedirler.

Anahtar Kelimeler: *Balık tüketimi, anket, tüketici tercihleri, konjoint analizi, Türkiye.*

Introduction

In recent years, global welfare increases, and health concerns ensure consumers more selective on food choices and consumers prefer more quality, healthy and ecological food products. Many studies from past to present have proven that increase in total household income leads to an increase in adequate level of protein intake (Myres and Kroetsch, 1978, p.208; Grigg, 1995, p.1; Schroeder, Barkley and Schroeder, 1995, p.15; Henchion et al, 2017, p.2; Iyangbe and Orewa, 2009, p.291). Nowadays, consumers' food preferences are shifting towards animal based products such as meat and fish instead of grains and legumes (Sangün and Güney, 2018, p. 9880).

Fish is a widely available nutrient-rich food source with high quality protein, vitamins and minerals (Vanhonacker, Pieniak and Verbeke, 2010, p.167; Erdoğan, Mol and Coşansu, 2011, p.632; Claret et al, 2012, p.260; Cardoso, Lourenço, Costa, Gonçalves and Nunes, 2013, p.21). It is also important for human nutrition because of the valuable nutrients it contains and its health benefits (Claret et al, 2012, p.260; Cardoso et al, 2013, p.21; Sangün and Güney, 2018, p.9980). The benefits of fish to the public health have caused authorities to give advice on increasing their consumption in many countries (Honkanen, Olsen and Verplanken, 2005, p.162; Cardoso, Lourenço, Costa, Gonçalves and Nunes, 2016, p.422; Smith, Varble and Secchi, 2017, p.268).

In recent years, the consumption of fish has increased due to the increase in the world population, promotion campaigns, advices and consumers' concerns regarding the healthy life (Erdoğan et al, 2011, p.632; Claret et al, 2012, p.260; Smith et al, 2015, p.268). As a result of promotion studies, the average per capita fish consumption increased from 9.9 kg to 19.2 kg from 1960 to 2012. Today, global sea food consumption has reached 158 million tons, of which 136.2 million tons is used as human food and 21.7 million tons for non-food use (Sangün and Güney, 2018, p.9880). In addition, factors such as population growth, increase in per capita disposable income, healthy food consumption trend, and urbanization have also had an impact on the increase in the consumption of seafood in recent years.

Positive developments in fish consumption in societies make it important to determine the factors that affect the consumption of these products in the market and their importance (Cardoso et al, 2013, p.21). In this sense, the factors that are considered to affect consumers' consumption of food and seafood products can be categorized as product attributes (obtaining method, nutritional value, quality, suitability, odor, flavor, availability), sensory properties, personal factors (demographic factors, preferences, attitudes, odor, accessibility) and cultural and social environment (Erdoğan et al, 2011, p.632; Claret et al, 2012, p.260; Thong and Olsen, 2012, p.80; Sangün and Güney, 2018, p.9880). Therefore, it is important to know consumers' attitudes and their preference priorities to these factors. In this scope, this study aims to identify the importance level of the attributes and attribute levels for fish choices of the consumers.

Material and Methodology

Material

The data used in the study was obtained from a face to face cross sectional survey which was conducted at the major cities of the seven regions of Turkey (İstanbul, Ankara, İzmir, Trabzon, Adana, Van and Gaziantep). The main reason for the selection of these cities was their geographical distribution and the sample size for each city was decided by considering the population sizes.

In total 526 consumers were sampled through convenience sampling who are responsible for their household purchases. Sample size was obtained from an infinitive population and assuming a confidential level of 95.5% (p=0.5). The present survey performed around the shopping centers by a commercial marketing agency during the period of July-September 2018. The questionnaire was designed in sections to gather information related socio demographic characteristics and a choice experiment card which consist of selected attributes and levels to assess consumers fish preferences using a choice experiment valuation method.

Table 1. Socio-demographic characteristics of the sample.

Gender	(%)	**Age**	(%)	**Education**	(%)
Female	52.5	≤34	42.1	Literate	5
Male	47.5	35–49	35.4	Primary–secondary school	32.8
		50–69	21.4	High school	33.7
		≥70	1.4	University or higher	28.5
Income	(%)	**Household Size**	(%)	**Occupation**	(%)
<1,500 TL	31.1	1	8.3	Employee	30.9
1,500–2,500 TL	36.8	2	12.4	Self-employment	19.2
2,501–3,500 TL	20	3	25.9	Unemployed	37.5
3,501–4,500 TL	7.4	4	28.7	Officer	11.4
>4,500 TL	4.7	>5	24.7		

₺: Turkish lira.

Methodology

Individuals will have to show their preferences by their choices on many subjects throughout their lives. the sum of all these choices constitutes the demands for goods and services. Predicting the preferences of individuals is one of the important research topics of marketing, and at this point it is necessary to understand how the characteristics of the products affect preferences (Raghavarao, Wiley, & Chitturi, 2011, p.1). For a business or market to be successful, the decision process must include a clear understanding of how customers will choose among and react to various competing alternatives (Rao, 2014, p.1). On certain conditions, it is possible to deduce the part worth (attribute importance scores and level values) of the respective attribute levels by regressing information about product attributes on sales or market share. Conjoint analysis (CA) also known as choice-based conjoint analysis (CBC), is a set of techniques ideally suited to studying customers' choice processes and determining trade-offs (Rao, 2014). The strategy with this approaches is to make inferences about the part worth of attribute levels from respondents' stated preferences or stated choices and the technique measures consumer preferences about the attributes of a certain product or service (Raghavarao et al, 2011, p.1).

The method has been applied successfully for tackling several marketing decisions such as optimal design of new products, target market selection, pricing a new product, and competitive reactions. In market analysis CA is applied to identify which attributes of a product or service are most important to consumers thus it is an important tool in the evaluation of the preferences assigned by the consumer to the various attributes that comprise a good (SPSS, 1997, p.1; Henson & Cranfield, 2009, p.258; Boesch, 2013, p.2183; Hailu Boecker, Rao, 2014, p.1; Barnebeu & Diaz, 2016, p.2). The basis of this approach is based on the fact that consumers' benefit maximization is derived from the properties of the products. According to Conjoint analysis, a product is essentially a set of features, and each feature has levels. The products for consumers are evaluated by estimating the importance of product characteristics to consumers (Manalo, 1990, p.119).

Experimental design

The conjoint analysis is consisting of 4 stages. The first stage is the preliminary for the design of the choice experiment. This effort requires the determination of attributes and levels which will take part at the choice card. In our study we determined four attributes and ten levels (Table 2) for fish consumption with the consideration of fish market trends, previous studies, and expert opinions.

Table 2. Attributes and levels used in the choice based survey design.

Attributes	**Attribute levels**
Fish type (2)	Sea bass, sea bream
Production method (2)	Wild, aquaculture
Place of purchase (3)	Supermarket, local market, fish market
Price (3)	₺20; ₺30; ₺40

However, it is unrealistic to ask individuals to rate the combination of attributes with total number of possible scenarios (Hanis, Nasir, Jinap, Alias and Karim, 2013, p.2866). Therefore, it is necessary as a second stage that the construction of the choice sets. In order to reduce all of the possible combinations of the full factorial design, a fractional orthogonal design

procedure is employed with using orthoplan in SPSS© 21 software and 9 product profiles were generated to make the estimation of the model possible (Ness and Gerhardy, 1994, p.26; Kumar, 2017, p.52). Later as the third stage participants were invited to rank these 9 profiles from the most desired to the least via face-to-face interviews. Finally, the conjoint analyze was performed with the orthoplan design and participants' preference rates by using SPSS© 21 software of IBM Co.

Findings

The conjoint analysis results give 3 main outputs; importance values for the attributes, utility estimates and values for product options. In conjoint analysis the measure of the importance of an attribute is derived by obtaining the difference between the part-worth of the most-desired level and the part-worth of the least-desired level (Manalo, 1990, p.119). The relative importance of the selected fish attributes for purchase actions was given in Table 3.

Table 3. Relative Importance of Fish Attributes Based on the Estimated Part-worth.

Attributes	Importance value
Fish type	19,991
Production method	20,718
Place of purchase	34,991
Price	24,300

The core output of conjoint analysis is the utility estimates. Table 4 shows the profits of each attribute and their respective standard errors. Higher profits values indicate greater preference (Gelmar, Reyner, Rodobaldo, and Alexander, 2016, p.33). Utility estimates shows which level of attribute is preferred by the consumers. In this demonstration higher utility values reflects better demand for the designated attribute levels (Kumar, 2017, p.52).

Table 4 also shows two statistics, Pearson's R and Kendall's tau, which provide the measure of correlation between the observed and estimated

preferences to assess the model's goodness of fit. According to these correlations the model is said to be representative (0.825 and 0.489 respectively).

Table 4. Utility Estimates

Attributes	Levels	Utility Estimate	Std. Error
Fish type	Sea bass	-,044	,220
	Sea bream	,044	,220
Production method	Aquaculture	-,249	,220
	Wild	,249	,220
Place of purchase	Supermarket	-,073	,293
	Local market	-,290	,293
	Fish market	,362	,293
Price	₺ 20	-,832	,508
	₺ 30	-1,248	,761
	₺ 40	-1,664	,815
Constant		6,346	,796
Correlations		Value	Sig.
Pearson's R		,825	,003
Kendall's tau		,489	,032

Discussion

Considering the relative importance outputs of the conjoint analysis, place of purchase (35%) found as the most important attribute for the consumers in this study. Price (24.3%), production method (20.7%) and fish type (20.7%) are the other attributes in order of importance in case of the consumers' fish purchase choices. In this case, it is very important that consumers give more importance to the place of purchase attribute rather than the price attribute. This is also an indication of the high level of awareness of consumers in their fish purchases.

In order to make a more detailed discussion on relative importance results of conjoint analysis, it is necessary to examine the calculated utility estimates for each attribute levels (Table 4). Depend on the utility estimates of place of purchase attribute which was the most important one, fish market is the most preferred level fallowed by local markets and supermarkets. This situation presents that consumers are looking for fresh

and quality products where they can find this from this markets. The consumers are also relying more to the sellers in fish markets who are specialized on seafood products. Local market found as the second important level for place of purchase attribute which promotes the importance of freshness for fish purchases. Price is also an important determinant for the fish purchases. In Turkish market fish prices are relatively high and price effects the meat purchases preference of consumers'. Naturally consumers prefer minimum price level in their fish purchases (₺ 20 per kg.). From the utility estimates for fish purchase choices for production method the consumers prefer wild fish instead of aquaculture production. Wild fish preference is also found in many studies on fish preferences (Altintzoglou, Vanhonacker, Verbeke, and Luten, 2011, p.485; Güney, 2019, p.218). Finally, the least important attribute was found as fish type and in case of the fish type consumers prefer sea bream to sea bass more. Finally, naturally they prefer the minimum price level and the all price values are negative identify that there is a negative relationship between price and choice attitude.

Conclusion

The purpose of this study was to analyze attributes and attribute levels that determine the choice behavior of fish consumers in Turkey. The relative importance of these attributes were also examined with the study. In this context, contributions of the Conjoint Analysis in identifying potential consumer's preferences have been validated in the study presented. The results of the study offer particularly significant contributions to marketing activities for fish and seafood products. Additionally, this study gave insight to policy makers intending to establish an aquaculture policy that enhances market orientation of the producers. The results show that the most important fish choice attribute for consumers is the place of purchase. They mainly prefer to buy the fish from the fish market instead of local market and supermarkets. Consumers are naturally willing to pay minimum and they prefer wild fish to aquaculture production.

References

Altintzoglou, T., Vanhonacker, F., Verbeke, W., and Luten, J. (2011). Association of health involvement and attitudes towards eating fish on farmed and wild fish consumption in Belgium, Norway and Spain. *Aquacult Int. 19,* 475–488. https://doi:10.1007/s10499-010-9363-2

Bernabéu, R. and Díaz, M. (2016). Preference for olive oil consumption in the Spanish local market. *Spanish Journal of Agricultural Research, 14(4),* 1-11. https://doi.org/10.5424/sjar/2016144-10200

Boesch, I. (2013). Preferences of processing companies for attributes of Swiss milk: A conjoint analysis in a business-to-business market. *J. Dairy Sci., 96,* 2183-2189. https://doi.org/10.3168/jds.2012-5887

Cardoso, C., Lourenço, H., Costa, S., Gonçalves, S. and Nunes, M.L. (2013). Survey into the seafood consumption preferences and patterns in the Portuguese population. Gender and regional variability, *Appetite, 64,* 20-31. https://doi.org/10.1016/j.appet.2012.12.022

Cardoso, C., Lourenço, H., Costa, S., Gonçalves S. & Nunes, M.N. (2016), Survey into the seafood consumption preferences and patterns in the Portuguese population: education, age and health variability. *Journal of Food Products Marketing, 22*(4), 421-435. https://doi.org-/10.1080/10454446.2014.949982

Claret, A., Guerrero, L., Aguirre, E., Rincón, L., Hernández, M.D., Martínez, I., Peleteir, J.B., Grau, A. and Rodríguez, C.R. (2012). Consumer preferences for sea fish using conjoint analysis: Exploratory study of the importance of country of origin. obtaining method. Storage conditions and purchasing price. *Food Quality and Preference, 26,* 259-266. https://doi.org/10.1016/j.foodqual.2012.05.006

Erdoğan, B.S., Mol, S. and Coşansu, S. (2011). Factors influencing the consumption of seafood in Istanbul, Turkey. *Turkish Journal of Fisheries and Aquatic Sciences, 1*, 631-639. https://doi.org/10.4194/1303-2712-v11_4_18

Gelmar, G.V., Reyner, P.C., Rodobaldo, M.V. and Alexander, S.V. (2016). Conjoint analysis tool for determining attributes on designing a graduate degree program. *Journal of International Business Research and Marketing, 1*(5), 33-38. https://doi.org/10.18775/jibrm.1849-8558.2015.14.3005

Grigg, D. (1995). The Pattern of World Protein Consumption. *Geoforum, 26(1),* 1-17. https://doi.org/10.1016/0016-7185(94)00020-8

Güney, O.I. (2019). Consumers' Perceived Differences between Wild and Farmed Fish: A Survey Study in Turkey. *Journal of Aquatic Food Product Technology, 28*(2), 2010-220. https://doi.org/10.1080/10498850.2019.1572684

Hailu, G., Boecker, A., Henson, S. and Cranfield, J. (2009). Consumer valuation of functional foods and nutraceuticals in Canada. A Conjoint Study Using Probiotics. *Appetite, 52,* 257-265. https://doi.org/10.1016/j.appet.2008.10.002

Hanis, A.I.A.H., Nasir, M.S., Jinap, S., Alias, R. and Karim, A.M.S. (2013). Consumer's preferences for eggs attributes in Malaysia: Evidence from conjoint survey. *International Food Research Journal, 20*(5), 2865-2872.

Henchion, M., Hayes, M., Mullen, A.M., Fenelon, M. and Tiwari, B. (2017). Future protein supply and demand: strategies and factors influencing a sustainable equilibrium. *Foods, 6*(53), 1-21. https://doi.org/10.3390/foods6070053

Honkanen, P., Olsen, S.O. and Verplanken, B. (2005). Intention to Consume Seafood-The Importance of Habit. *Appetite, 45,*161-168. https://doi.org/10.1016/j.appet.2005.04.005

Iyangbe, C.O. and Orewa, S.W. (2009). Determinants of daily protein intake among rural and low-income urban households in Nigeria. *American-Eurasian Journal of Scientific Research, 4*(4), 290-301.

Kumar, J. (2017). An Analytical Study on Consumer's Preferences for Eggs Attributes through Conjoint Survey. *Pacific Business Review International, 9*(7), 52-58.

Manalo, A.B. (1990). Assessing the importance of apple attributes: an agricultural application of conjoint analysis. *Northern Journal of Agricultural and Resource Economics, 19,*118-124.

Myres, A.W. and Kroetsch, D. (1978). The influence of family income on food consumption patterns and nutrient intake in Canada. *Canadian Journal of Public Health, 69,* 208-221.

Ness, M.R. and Gerhardy, H. (1994). Consumer preferences for quality and freshness attributes of eggs. *British Food Journal, 96*(3), 26-34. https://doi.org/10.1108/00070709410060808

Raghavarao, D., Wiley, J.B. and Chitturi, P. (2011). *Choice based conjoint analysis models and designs*. United States of America:Taylor & Francis Group,. https://doi.org/10.1201/9781420099973

Rao, V.R. (2014). *Applied conjoint analysis*.Berlin: Springer. https://doi.org/-10.1007/978-3-540-87753-0

Sangün, L. and Güney, O.I. (2018). Growing environmental awareness in Turkey's seafood purchase options: the position of supermarkets. *Fresenius Environmental Bulletin, 27*(12B), 9880-9886.

Schroeder, T.C., Barkley, A.P. and Schroeder, K.C. (1996). Income growth and international meat consumption. *Journal of International Food & Agribusiness Marketing, 7*(3), 15-30. https://doi.org/10.1300/-J047v07n03_02

Smith, S., Varble, S. and Secchi, S. (2017). Fish consumers: environmental attitudes and purchasing behaviour. *Journal of Food Products Marketing, 23*(3), 267-282. https://doi.org/10.1080/10454446.2014.-940114

SPSS (1997). *SPSS Conjoint™ 8.0*. Chicago.

Thong, N.T. and Olsen, S.O. (2012). Attitude toward and consumption of fish in Vietnam. *Journal of Food Products Marketing, 18*, 79-95. https://doi.org/10.1080/10454446.2012.653778

Vanhonacker, F., Pieniak, Z. and Verbeke, W. (2010). Fish market segmentation based on consumers' motives, barriers and risk perception in Belgium. *Journal of Food Products Marketing, 16*(2), 166-183. https://doi.org/10.1080/10454440903415550

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