RESEARCH ARTICLE

Examination of Meat Consumption Preferences of Academician Veterinarians: Example of Bursa Province

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Akademisyen Veteriner Hekimlerin Et Tüketimi Tercihlerinin İncelenmesi: Bursa İli Örneği

Öz

Amaç: Bu çalışmada konjoint analiz yöntemi ile akademisyen veteriner hekimlerin et tüketimi tercihlerini belirlemeye yönelik bir araştırma yapılmıştır.

Gereç ve Yöntem: Çalışmaya Türkiye Bursa'da bir devlet üniversitesinin veteriner fakültesinde görev yapan 69 veteriner hekim katılmıştır. Araştırmada veri toplama aracı olarak anket yöntemi kullanılmıştır. Mart-Nisan 2014 zaman diliminde uygulanan anket çalışmasında sağlık, lezzet ve hijyen niteliklerinin her biri için iki düzey belirlenmiş ve ortogonal deney düzeni kullanılmıştır. Ortogonal düzen yardımıyla 7 seçim kartı oluşturulmuş ve bu kartlar anket formunda çalışmaya katılan veteriner hekimlere sunulmuştur. Katılımcılardan dört et çeşidi (tavuk eti, dana eti, koyun eti ve hindi eti) için ayrı ayrı olmak üzere belirlenen özelliklere göre oluşturulan seçim kartlarına sıra numarası verilmesi istenmiştir. İncelenen tüm et türleri için önemlilik değerleri hesaplanmıştır. Sonuçlar cinsiyete ve ailede kardiyovasküler hastalığın varlığına göre ayrı ayrı değerlendirilmiştir.

Bulgular: Bu çalışmaya katılan katılımcılara uygulanan anket sonuçları sağlığın tüm et çeşitleri için en önemli nitelik olduğunu ancak hijyen ve lezzet niteliklerinin sıralamasının cinsiyet ve kardiyovasküler hastalık varlığının aile öyküsüne göre değişiklik gösterdiğini ortaya koymaktadır.

Öneri: Bu çalışma ile hayvansal üretim ve hayvan sağlığı açısından üst düzeyde bilgiye sahip akademisyen veteriner hekimlerin et tüketimi tercihlerini belirlerken sağlık, lezzet ve hijyen faktörlerini dört et türü için nasıl değerlendirdikleri konjoint analiz yardımıyla inceleyerek kapsamlı bir çalışma sunulmak istenmiştir.

Anahtar Sözcükler: Et tüketimi, konjoint analiz, nitelik, tercih.

Abstract

Aim: In this study, research was conducted to determine the meat consumption preferences of academician veterinarians by conjoint analysis.

Materials and Methods: A total of 69 veterinarians, who are working in a veterinary faculty of a public university in Bursa Turkey, participated in this study. Survey method was used as a data collection tool in the research. In the survey conducted in March-April 2014, two levels were determined for each of the health, taste, and hygiene qualities, and orthogonal experimental design was used. With the help of orthogonal experimental design, seven plancards were created and presented to the veterinarians who participated in the survey form. Participants were asked to give sequence numbers to the plancards that were created for four types of meat (poultry meat, beef, mutton, and turkey meat). Importance values were calculated for all meat types studied. Results were evaluated separately according to gender and history of cardiovascular disease presence.

Results: The results of the questionnaire applied to the participants showed that health is the most important attribute for all meat types whereas related to the variety of meat, hygiene and taste ranking varied according to gender and family history of cardiovascular disease presence.

Conclusion: In this study, it is planned to present a comprehensive study for four meat types by examining how the health, taste and hygiene factors of the veterinarians who have high-level knowledge in terms of animal production and animal health evaluate the meat consumption preferences.

Keywords: Meat consumption, conjoint analysis, quality, preference.

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Introduction

To maintain their physical and mental activity and stay healthy, it is necessary for people to take in nutrients, including nitrogen. Some amino acids, which are the building blocks of proteins and contain nitrogen, are synthesized in the body. However, others must be acquired from outside the body. Because these amino acids are found in sufficient and balanced quantities in meat, it is a primary dietary component (Nagasawa et al 2012, Tomé 2013, Uauy 2013).

Among animal-based foods, meat is important and is an important source of protein. Furthermore, meat provides lipids, minerals and vitamins. After water, protein are the most essential nutrients for bodily growth and disease protection. Protein aids in the production of hormones and contributes to controlling water balance and acid-base balance (Tomé 2013).

Meat protein has especially high biological value because meat protein contains all of the amino acids necessary for human nutrition. Absorption of the protein is 97-98%. Therefore, almost all of the protein is used by the body. Even if sufficient vegetable proteins to meet the daily requirement are consumed, the body's protein needs will remain unmet. This is because vegetable proteins are poorer in terms of the essential amino acid contents. A healthy individual should eat 0.91 g per kg of protein daily (Uauy 2013, Pencharz 2013).

In recent years, some studies have proposed that red meat and meat products are harmful to health. Additionally, obesity (due to meat-based nutrition), cardiovascular disease (CVD) and cancer risk are mentioned frequently. However, every food can be toxic when consumed without careful consideration. Additionally, current trends regarding the reporting of food illness outbreaks indicate that consumers are becoming more concerned about hygiene and quality.
The nutritional status of the population shows important differences and inequalities according to socioeconomic levels, seasons, regions and urban-rural settings. In developing countries, the annual meat consumption per person is 33.3 kg, whereas in developed countries, it is 79.3 kg (Stiftung 2014). Studies focusing on meat consumption and consumer preferences have been rather limited. For instance, Akpinar et al (2009) focused on fish consumption, whereas Kwadzo et al. (2013) focused on broiler meat only.

We took advantage of conjoint analysis to examine meat consumption among veterinarians in our study. Conjoint analysis is a technique that originated in mathematical psychology and is widely used for the evaluation of consumer preferences in several fields. In this method, the researcher chooses a set of attributes and determines the levels of each attribute (Stott et al 2005). After generating combinations of different attribute levels, consumers are asked to rank them. Using conjoint analysis, the questioning can be adapted to represent individual priorities. Additionally, with suitable scaling, individual responses can be gathered to obtain average utility values and relative importance values for each level of each attribute.

In this study, we intended to determine the consumption preferences of four meat types by conjoint analysis to elucidate which is the most essential protein source for nutrition. The views of veterinarians who have superior knowledge of meat were included in this study.

Materials and Methods

The sample of the study is comprised of veterinarians who work as an academician in veterinary medicine faculty at Bursa in Turkey. Survey method was used as a data collection tool in the research. Total of 69 veterinarians participated in this study. The questionnaire was administered to the participants by a specialist in the form of a face-to-face survey method in March-April 2014 period.

In this study, to conduct the conjoint analysis, we selected three attributes and their respective levels. We used health, hygiene, and taste as risk factors. Each of these risk factors had two categories: "less" and "more". The full-profile approach was used as the data collection technique (for composing attribute-level combinations), and we created an orthogonal design to reduce the number of combinations. To obtain a reduced design, seven possible combinations of risk factors were used in the study, and a plancard was created.

We used an explanatory section in the questionnaire to describe the purpose of the study and how to rank the combinations and assign a numeric probability. The most critical scenario was ranked. First, the next most critical profile ranked second, and so on, until the last important situation was ranked seventh. The rankings were analyzed using regression analysis, which generates a relative score for each individual attribute level (Andersen et al 2010, Jimenez-Guerrero et al 2012).

The conjoint analysis was carried out by asking the respondents to rank the items with the different factor combinations presented to them (Nissen and Krieter 2003). Thus, the preferences of the respondents would be revealed by their selections rather than by direct statements about preferences for a specific level of a single factor (Andersen et al 2010). The relative importance of the selected attributes were calculated by using IBM SPSS Statistics 20 software. The program produced output indicating the "average importance" of each measure analyzed.
Importance values were calculated for all respondents and grouped by gender and the presence of a family history of

Election Card	Taste	Health	Hygiene
		Table 1. Plancard for determining meat consumption	
1	More Delicious	More healthy	Less Hygiene
2	Less Tasty	More healthy	More Hygiene
3	More Delicious	More healthy	More Hygiene
4	More Delicious	Less healthy	Less Hygiene
5	More Delicious	Less healthy	More Hygiene
6	Less Tasty	Less healthy	More Hygiene
7	Less Tasty	More healthy	Less Hygiene

cardiovascular disease. Additionally, the values were sorted in ascending order.

Results

Thirty-nine (56.5%) male and 30 (43.5%) female academician veterinarians were included in the study. The median of the year in the profession of academicians was 11 (1-32) years. In terms of cardiovascular disease (CVD), 30 (43.5%) respondents were determined to have a family history, whereas 39 (56.5%) did not.

The results of the conjoint analysis on meat consumption of academician veterinarians who participated in this study are presented in Table 2, summarizing the relative importance, in percentages, obtained per risk factor.

According to the results of this study, for all meat types, it has been observed that health has the highest importance value for the academician veterinarians. Based on the results, male respondents clearly preferred health (37.049; 40.241), taste (36.618; 32.978) and hygiene (26.333; 26.781), respectively, for poultry meat and mutton, whereas female respondents preferred the same ranking for turkey meat. For beef, the attributes were ranked as health (39.180), hygiene (30.341) and taste (27.701) by males. In contrast, females ranked them as taste (36.595), health (34.294) and hygiene (25.540).

For mutton, respondents with a family history of cardiovascular diseases (CVD+) preferred health, taste and hygiene, from highest to lowest, with importance values of 37.296, 33.252 and 25.606, respectively. This sequence was similar for turkey meat and beef for this group. Furthermore, a similar order was observed in the respondents with no family history of cardiovascular diseases for poultry meat, beef and mutton. For that group, turkey meat hygiene was more preferable with a 32.013 importance value, compared to taste, which showed a 27.951 importance value.

Discussion

When deciding to purchase a product, many features are considered together. Especially if the product relates to human health and nutrition, individuals are more selective while making choices and form their preferences based on the best combination of attributes. There can be many types of factors that affect the choice of meat consumption such as income status, culture, price and quality. However, we planned this study ignoring such criteria. In fact, in this study we evaluated the opinions of the veterinarians that are working and trained in this area.

This method that we used to examine preferences of veterinarians related to meat consumption, called conjoint analysis, is a relatively new method in the area of veterinary medicine (Nissen and Krieter 2003, Jimenez-Guerrero et al 2012). The main advantage of this method, compared to direct interviews, is the ability to present real scenarios to respondents and analyze their responses to determine which factors are important in consumer decision-making (Nissen and Krieter 2003, Andersen et al 2010). Blijlevens et al. (2009), Govers and Schoormans (2005) indicated that in some studies, images and symbols would be used to implement a conjoint analysis to test consumer preferences.

While there are many reports focusing on other nutrients, ranging from olive oil to wine and dairy fruit and vegetables, there have been no studies that evaluate the four meat types studied here together. One of the studies that examined consumer preference is that of Akpınar et al. (2009), which analyzed fish consumption. The factors that were examined in this study include variety (bream, bass and trout), production method (conventional, organic), supply channel (supermarket, fish bazaar, local bazaar) and price (low, medium and high). In addition, Kwadzo et al (2013) examined preferences for broiler meat in Ghana. According to the authors, taste, availability and proximity are important attributes. In addition, in some studies, region of origin was determined to be an important factor affecting consumer attitudes about meat products (Mennecke et al 2007).

In our study, we aimed to identify which attributes assume

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		Poultry Meat	Beef	Mutton	Turkey Meat
Overall	Taste(T)	34.370	31.592	33.554	27.465
	Health(Ht)	36.456	37.043	36.918	41.789
	Hygiene(Hy)	29.174	28.241	27.941	29.078
		Hy<T<Ht	Hy<T<Ht	Hy<T<Ht	T<Hy<Ht
Male	Taste(T)	36.618	27.701	32.978	25.565
	Health(Ht)	37.049	39.180	40.241	44.064
	Hygiene(Hy)	26.333	30.341	26.781	30.371
		Hy<T<Ht	T<Hy<Ht	Hy<T<Ht	T<Hy<Ht
Female	Taste(T)	31.559	36.595	34.321	29.951
	Health(Ht)	35.715	34.294	32.488	38.815
	Hygiene(Hy)	32.726	25.540	29.487	27.388
		T<Hy<Ht	Hy<Ht<T	Hy<Ht<T	Hy<T<Ht
CVD present (CVD+)	Taste(T)	35.580	32.888	33.252	26.785
	Health(Ht)	34.682	39.072	37.296	44.245
	Hygiene(Hy)	29.738	28.040	25.606	24.970
		Hy<Ht<T	Hy<T<Ht	Hy<T<Ht	Hy<T<Ht
CVD absent (CVD-)	Taste(T)	33.513	30.646	33.766	27.951
	Health(Ht)	39.421	35.562	36.653	40.035
	Hygiene(Hy)	27.066	28.387	29.581	32.013
		Hy<T<Ht	Hy<T<Ht	Hy<T<Ht	T<Hy<Ht

Table 2. Relative importance values of the attributes by meat type

CVD: Cardiovascular Disease; T: Taste; Ht:Health; Hy: Hygiene

greater importance and, therefore, are preferred by the consumer for poultry meat, beef, mutton and turkey meat. In this regard, culture helps to explain the behavioral differences between various consumers. Based on overall evaluation, health was the most important attribute for academician veterinarians who participated in this study. However, when only considering turkey meat, the value of taste was less than that of hygiene. Preference for turkey meat was usually based on hygiene rather than taste.

In men, for poultry meat and mutton, taste was found to be a higher priority than hygiene. On the contrary, for beef and turkey meat, hygiene was reported as a more important factor than taste. According to women academian veterinarians, for beef and mutton, taste was the most important attribute, followed by health and hygiene. Based on the idea that women are more rigorous with regard to cleanliness, these results are surprising. For poultry meat and turkey meat, welfare was again the most important attribute for women. The role of gender in determining preferences about food and meat consumption has been examined previously (Mennecke et al 2007). In these studies, the results showed differences between the attributes identified by men and women.

Women were found to give higher ratings to health concerns. Interestingly, this finding is not consistent with the results obtained from our study.

According to academician veterinarians who participated in this study with a family history of cardiovascular disease (CVD+), for meat types other than poultry meat, health had the highest priority. The reason for this may be common knowledge that white meat is healthier than red meat. Many studies have reported that red meat consumption is associated with an increased risk of cardiovascular disease (Cross 2012, Larsson and Orsini 2013, McAfee et al 2010, Babio et al 2012). In contrast, Micha et al (2010) indicated that consumption of processed meats, but not red meats, is associated with higher incidence of CVD. In addition, although meat consumption is commonly considered a risk factor for cardiovascular and metabolic diseases, they reported that effects may change depending on the type of meat consumed.

For all meat types, health has the highest importance value for veterinarians with no family history of cardiovascular disease (CVD-). Only for turkey meat, hygiene is more preferable than taste. We have already mentioned this reason.

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In addition, our analysis shows that health is the most important attribute for meat consumption for academician veterinarians who participated in this study. Related to the variety of meat, another interesting finding is that hygiene and taste ranking varied according to gender and disease presence.

This study represents a comprehensive application of the conjoint analysis method for the analysis of preference for four meat types. In this respect, there is no similar research. A feature of this study is that it demonstrates that consumer education could change the attitudes and priorities affecting consumption preferences.

The results revealed that poultry meat is the meat type with the highest taste value for academician veterinarians who participated in this study who are male and have a family history of cardiovascular disease (CVD+). Also, female veterinarians indicated beef as the most delicious meat type. With respect to health, turkey meat is the most preferred meat-type without considering gender or family history of CVD. For veterinarians who are female and have a family history of cardiovascular disease (CVD+), poultry meat is the most hygiene-oriented type, whereas, for male veterinarians, beef and turkey meat are similar in terms of hygiene.

Conclusion

This study was planned to determine the qualifications of veterinarians who are currently working as academicians in terms of meat consumption and whether the importance of each of these qualities is the same. As a result of this study, it is emphasized that it is necessary to investigate the meat consumption preferences of the participants who are veterinarians who have high-level knowledge in terms of animal health and production. Also, it has been shown that it is possible to evaluate multiple qualities at the same time in the choice of meat consumption in terms of the method used. In this study, it was aimed to obtain a comprehensive result by evaluating the importance levels of preferences under four meat types.

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