ANALYZING THE ROLE OF DEMOGRAPHIC VARIABLES IN RED MEAT PURCHASING DECISIONS: THE CASE OF IĞDIR PROVINCE

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Abstract: Red meat has an important place for a balanced and healthy diet. Researching red meat consumption is important to address many health, environmental and cultural issues. This study aims to determine the relationship between consumers' socio-economic characteristics, which are gender, income, education level, and criteria of red meat purchasing decision. The sample size was determined using the simple random sampling method. A survey based on face-to-face interviews was conducted with 384 consumers residing in the Iğdır province. The Mann-Whitney-U Test and Kruskal-Wallis Test were used in the statistical analysis of the study. It was determined that female consumers gave more importance to criteria such as food safety and whether the product was oily or not (P<0.05). Similarly, it was determined that price sensitivity decreased with the increase in income level, but health-related elements such as food safety became more prominent (P<0.01). It was observed that as the level of education increased, the importance given to whether the products were locally sourced also increased (P<0.05). These results can guide the determination of target market strategies for the red meat sector and the development of products and services to meet consumer expectations.

Keywords: Red meat, Purchasing decision criteria, Consumer preferences, Iğdır

1. Introduction

Red meat has been an integral component of human diets for centuries, serving as a critical source of high-quality protein and essential micronutrients. (McAfee et al., 2010). Red meat provides bioavailable forms of key nutrients that are often difficult to obtain in sufficient quantities from plant-based sources. High- quality proteins from red meat contain all essential amino acids, making it a complete protein source. These attributes underscore the role of red meat as an important dietary component, especially in regions where malnutrition remains a public health concern. (Williams, 2007; Hurrell and Egli, 2010). Despite its nutritional value, red meat consumption has been the subject of ongoing debate due to health and environmental concerns. However, understanding its importance within a balanced diet and the socio-economic factors influencing consumer preferences is essential for public health and improving the service quality of retailers.

According to FAO data, world beef production in 2020 was 67.9 million tons, sheep/goat meat production was 16.1 million tons, and the USA (12.3 million tons) was in first place in beef production, while China (5.1 million tons) was in first place in sheep/goat meat production (FAO, 2020). According to TÜİK data, Türkiye's beef production in 2022 was 1.57 million tons, sheep meat production was 489 thousand tons, and goat meat production was 115 thousand tons (TÜİK, 2022). The per capita red meat production amount in Türkiye is 13.59 kg, which is well below the world average (Fidan, 2021).

Red meat purchasing is related to the issues discussed in the literature. These are quality attributes, price sensitivity, nutritional and health concerns, taste and culinary use, ethical and environmental considerations, cultural and regional influences, marketing and branding. This study focuses on consumers' purchasing decision criteria. Akbay and Boz (2005) state that consumers often prioritise freshness, as it is associated with better taste and safety. Visual cues, such as colour and texture, play a critical role in assessing freshness. Şengül (2016) made a strong case that price is a critical determinant, especially for low- and middle-income households. Consumers will always opt for cheaper cuts, alternative protein sources, or processed red meat products based on budget constraints. McAfee et al. (2010) found that awareness of red meat's nutritional benefits (e.g., high-quality protein, iron) drives purchasing decisions among health-conscious consumers. However, concerns about saturated fat, cholesterol, and links to chronic diseases (e.g., cardiovascular issues) remain. Gül (2010) showed higher-income households are more likely to afford premium cuts or grass-fed, organic meat, whereas low-income households prioritise affordability. Hurrell and

Egli (2010) have pointed out increasing awareness of food safety and ethical sourcing. Kadanali et al. (2010) found out that there is no relationship between income level of consumers and choice of place of meat purchase. Although there are many studies on red meat consumption in the literature, there are limited studies on red meat purchasing preferences. It is thought that filling the gap in the literature will contribute. Consumers' red meat purchasing preferences is very important research topic because it provides leading information on healthy eating habits, contributes to the livestock industry, and helps retailers and policy makers understand the criteria consumers care about when purchasing products. This study aims to determine the relationship between consumers' socio-economic characteristics, which are gender, income, education level, and criteria of red meat purchasing decision. The aim of this study was to explore the socio-economic characteristics of consumers and the relationship between their purchasing decision criteria.

2. Materials and Methods

The main material of the research consists of original data obtained through a survey from 384 consumers living in Iğdır province in August-September 2024. In determining the number of households to which the survey was applied, the proportional sample size formula used to reach the maximum sample size in limited populations was used (Newbold, 1995). This method has been used in many studies on food consumption (Uzunöz et al., 2008; Karakaş, 2010; Akçay and Vatansever 2013; İkikat Tümer et al., 2017).

Formula (equation 1) used in sampling is:

$$n = \frac{N_p(1-p)}{(N-1)\sigma_{px}^2 + p(1-p)} \tag{1}$$

In the equation (1); "N" is the total number of people in the sample frame, "n" is the sample volume, "p" is the estimation rate (since the characteristics of the consumers constituting the main population are not known at the beginning, P=0.5 was taken to maximize the sample volume), "σ_{px}^2" is the variance of the rate (90% confidence interval and a 5% error margin were used to reach the maximum sample volume). In the formula, the population of Iğdır city center was taken as 132110 based on the TÜİK (2024) data as the main population, a 95% confidence interval and a 5% deviation from the mean were used, and the sample volume was calculated as 384.

The survey numbers were distributed to neighborhoods and villages in Iğdır province according to their household weights. These neighborhoods and villages were examined on the basis of geographical regions that could represent the city center. When determining these neighborhoods, attention was paid to reflecting all income and education groups. In determining the number of consumers to be interviewed in each settlement, the shares of the settlements in the total population were taken as basis and the consumers included in the sample were randomly determined.

In the research, consumers' red meat purchasing preferences were examined based on socioeconomic characteristics. The criteria considered important in the decision to purchase red meat were food safety, appearance, smell, freshness, price, packaging feature, whether fatty or not, whether imported or not, whether local animal or not. The research model is derived from some consumption studies in the literature, some of which belongs to Onianwa et al. (2006); Akpınar et al. (2009); Bulut et al. (2022). One of the most basic and popular scaling methods used in social science research is the Likert scale (Taherdoost, 2019). The degree of importance of the criteria in the decision to purchase red meat was measured using a 5-point Likert scale in which scales are strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5) (Preedy and Watson, 2010). The 5-point Likert scale analysis is commonly used because respondents can easily answer the questions in this format.

Kolmogorov Smirnov test was used to test whether the data showed normal distribution. The method used to test the normality assumption is normality tests. The fact that normality tests are significant indicates that the data differ significantly from the normal distribution. In contrast, the fact that normality tests are not significant indicates that the data do not differ significantly from the normal distribution (Demir, 2022). It was found that the criteria of "food safety, appearance, smell, freshness, price, packaging, fatty or not, whether imported or not and whether local or not" did not show a normal distribution according to the Kolmogorov-Simirnov normality test (P<0.01).

The Mann-Whitney test is a commonly used nonparametric alternative to the Two-sample T-Test (Perme and Menevski, 2019). The Kruskal-Wallis test is useful as a general nonparametric test for comparing more than two independent samples (Ostertagová et al., 2014). Since the assumptions of parametric statistics were not met, the Mann-Whitney U test and the Kruskal-Wallis test were preferred. The Mann-Whitney U test was used to assess the differences in the criteria for purchasing red meat by gender, divided into two groups, male and female. In addition, the Kruskal-Wallis test was used to assess the differences in red meat purchase decision criteria by household income level, divided into three categories, and education level, divided into four categories.

3. Results

3.1. Socio-economic Characteristics of Household Head

Socio-economic characteristics of household head are shown in table 1. Of the participants, 63.3% were male, 36.7% were female, the average age was 40.51, and 37.5% were 45 years of age or older. In terms of marital status, it was determined that the majority of the participants (77.9%) were married, and the highest group in terms of education level was secondary school graduates with a rate of 34.1%. While the highest rate among occupational groups was composed of freelancers (27.6%), it is noteworthy that the rate of unemployed individuals was 7.8%.

Table 1. Socio-economic characteristics of household head

Variables	Categories	Frequency	Percentage (%)
Gender	Male	243	63.3
	Female	141	36.7
Age (Year) (Mean: 40.51)	≤30	121	31.5
	31-44	119	31.0
	45≤	144	37.5
Marital status	Single	75	19.5
	Married	299	77.9
	Divorced	10	2.6
Education level	Uneducated	36	9.4
	Primary school	105	27.3
	Secondary school	131	34.1
	Higher education	112	29.2
Occupational group	Freelance	106	27.6
	Civil Servant	65	16.9
	Retired	18	4.7
	Farmer	61	15.9
	Private Sector Employee	50	13.0
	Tradesman	54	14.1
	Unemployed	30	7.8

3.2. Socio-economic characteristics of the household

Table 2 shows some Socio-economic characteristics of the household. The average household income was calculated as 38,747 TL and it was seen that 26.8.% of the participants were in the low-income group. The average household size was 3.96 people, and the most common household type was 3-4 people, with a rate of 45.1%. It was stated that only one person worked in 66.4% of the households, two people worked in 28.9%, and five or more people worked in 4.7%. These data reveal that the participants mostly came from medium-sized households and from economic groups that varied in terms of income level.

Table 2. Some characteristics of household

Variables	Categories	Frequency	Percentage (%)
Household income level (TL/month) (Mean: 38747.72)	Low (0-17002)	103	26.8
	Middle (17003-30000)	120	31.3
	High (30001≤)	161	41.9
Household size (person) (Mean:3.96)	≤2	67	17.4
	3-4	173	45.1
	5≤	144	37.5
Number of working individuals in the household	1	255	66.4
	2	111	28.9
	5≤	18	4.7

3.3. Importance Degree of Some Criteria for Purchasing Decision

Figure 1 illustrates the degrees of importance attributed by consumers to various criteria in their decisions to purchase red meat. The results emphasize that food safety, appearance, and smell are the most critical factors influencing purchasing behavior, followed closely by freshness and whether the product is locally sourced. These findings align with existing literature, which consistently underscores the centrality of food safety and product quality in consumer decision-making. For instance, McAfee et al. (2010) argue that consumers increasingly value food safety due to rising awareness of health risks associated with contaminated meat products.

Similarly, Şengül (2016) highlights that visual cues such as appearance and freshness significantly impact consumer perceptions of quality and safety, driving their purchasing preferences. Özüak (2021) states that the factors influencing the red meat preferences and purchasing behaviour of people living in Konya are the place of purchase (46.5%), the type of meat (17.7%), the way of purchase (13.0%), the fat content of the purchased meat (12.9%) and finally the price of meat. Yılmaz Tilki and Keskin (2024) state that almost all (98.9%) of the consumers who participated in the survey stated that they take quality into account when consuming and pointed out that various factors determine quality, especially the reliability of the place of purchase (17.8%), the colour of the meat (17.8%), the freshness (16.7%) and the smell (11.1%).

In contrast, price appears to hold relatively lower importance in consumer evaluations. This observation aligns with Gül (2010), who found that higher-income households tend to deprioritize price considerations in favor of quality attributes like freshness and safety. Moreover, as Wang et al. (2004) explain, the increasing awareness of health and environmental issues leads to a shift in consumer focus from cost-efficiency to quality and sustainability.

Overall, the findings from figure 1 indicate a clear consumer inclination towards health-conscious and quality-driven purchasing behavior. This aligns with broader trends identified in the literature, suggesting that consumer preferences are evolving towards a more nuanced evaluation of product attributes beyond mere cost considerations. Such insights provide valuable implications for stakeholders in the meat industry to develop marketing and production strategies that cater to these priorities.
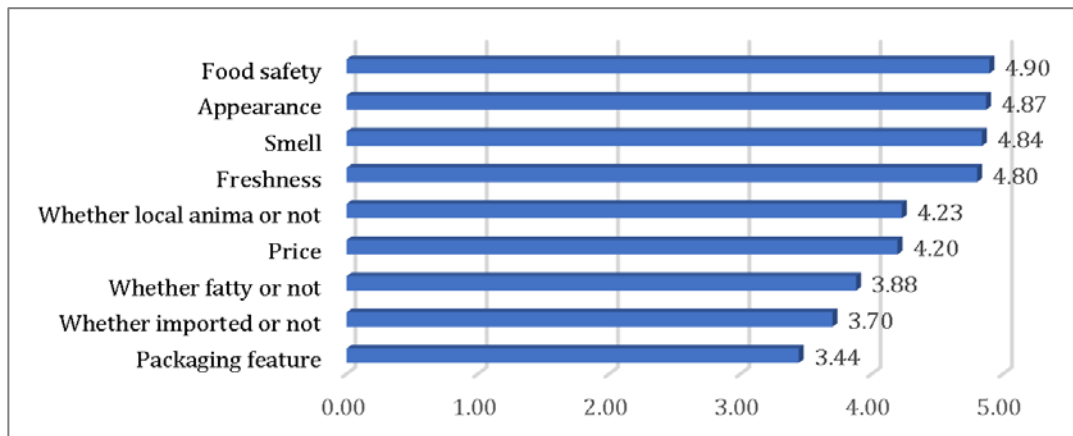
Figure 1. Importance degree of criteria in red meat purchasing decision.

3.4. Relationship Between Gender and Criteria in Red Meat Purchasing Decision

Table 3 presents the relationship between gender and various criteria influencing red meat purchasing decisions, analyzed using the Mann-Whitney U test. The results highlight significant gender-based differences in certain criteria. Women prioritize food safety (P<0.05) and fat content (P<0.01) more than men, reflecting a stronger focus on health-related factors. Conversely, men are more price-sensitive (P<0.01) and place greater importance on purchasing meat from local animals (P<0.01). No significant differences were observed between genders in evaluating criteria such as appearance, smell, freshness, packaging features, and whether the meat is imported, suggesting these factors are equally valued by both. These findings reveal that women tend to prioritize health and quality, while men focus more on cost and sourcing, providing valuable insights for tailoring marketing strategies.

3.5. Relationship Between Income Level and Criteria in Red Meat Purchasing Decision

Table 4 presents the relationship between household income level and the criteria that affect red meat purchasing decisions in detail. While households in the high-income group attach the highest importance to quality-related criteria such as food safety (P<0.01) and freshness (P<0.01), it is noteworthy that they are less sensitive to price (P<0.01). This situation shows that with the increase in income level, there is an increase in quality and health-oriented preferences in parallel with the decrease in the share allocated to food in total expenditures. On the other hand, households in the low-income group attach more importance to the price criterion and tend to prefer economical options. Those in the middle-income group exhibit a balance between these two extremes. Arısoy and Bayramoğlu (2015) posited that as income level increases, expense ratio for food decreases. Similarly, Sacli and Ozer (2017) determined that higher-income households allocate more resources to quality attributes such as freshness and safety. Gürbüz et al. (2023) stated that the change in income status affects the purchasing frequency of consumers.

The findings also show that consumers in the high-income group attach more importance to locally sourced products (P<0.01). It can be thought that the importance given to local production is due to the higher awareness of sustainability and product quality in consumers with

high income levels. In addition, it is seen that the interest in imported products varies according to income level, and especially in the low-income group, imported products are not preferred (P<0.01). These trends reveal that the income level of consumers is a determining factor not only on price sensitivity but also on their perceptions of quality, health and local products. It can be said that table 4 provides an important guide in understanding consumer behavior in general and shaping marketing strategies according to income groups.

Table 3. Mann-Whitney U Test results for relationship between gender and criteria in red meat purchasing decision

Criteria	Gender	Frequency	Mean	Std. Deviation	Mann-Whitney U Test	P-value
Food safety	Female	141	4.950	0.218	15793.000	0.014**
	Male	243	4.864	0.378		
Appearance	Female	141	4.872	0.203	16450.500	0.136
	Male	243	4.864	0.275		
Smell	Female	141	4.844	0.364	17103.500	0.966
	Male	243	4.835	0.393		
Freshness	Female	141	4.801	0.466	16759.500	0.600
	Male	243	4.802	0.399		
Price	Female	141	3.922	1.208	13336.000	0.000
	Male	243	4.354	1.007		
Packaging feature	Female	141	3.418	1.116	16722.500	0.687
	Male	243	3.457	1.196		
Whether fatty or not	Female	141	4.121	0.815	13980.500	0.001*
	Male	243	3.741	1.092		
Whether imported or not	Female	141	3.631	1.085	16010.000	0.266
	Male	243	3.741	1.140		
Whether local anima or not	Female	141	3.972	1.388	14717.000	0.008*
	Male	243	4.379	1.062		

Significance level= *P-value < 0.01; ** P-value < 0.05

Table 4. Kruskal-Wallis Test results for income level and criteria in red meat purchasing decision

Criteria	Household income level	Frequency	Mean	Std. Deviation	Chi-Square	P-value
Food safety	Low	103	4.922	0.362	19.78628303	0.000*
	Middle	120	4.800	0.402		
	High	161	4.950	0.218		
Appearance	Low	103	4.864	0.269	0.243232919	0.885
	Middle	120	4.883	0.250		
	High	161	4.857	0.242		
Smell	Low	103	4.806	0.444	0.45327574	0.797
	Middle	120	4.850	0.359		
	High	161	4.851	0.357		
Freshness	Low	103	4.738	0.484	24.26048294	0.000*
	Middle	120	4.692	0.499		
	High	161	4.925	0.263		
Price	Low	103	4.621	0.818	62.26029171	0.000*
	Middle	120	4.533	0.819		
	High	161	3.671	1.229		
Packaging feature	Low	103	3.408	1.167	2.593560394	0.273
	Middle	120	3.317	1.202		
	High	161	3.559	1.134		
Whether fatty or not	Low	103	3.961	1.038	8.480813071	0.014**
	Middle	120	3.592	1.213		
	High	161	4.043	0.769		
Whether imported or not	Low	103	3.709	1.035	21.09260702	0.000*
	Middle	120	3.358	1.114		
	High	161	3.950	1.117		
Whether local anima or not	Low	103	4.214	1.234	15.81158157	0.000*
	Middle	120	3.942	1.318		
	High	161	4.453	1.054		

Significance level:*P-value < 0.01; ** P-value < 0.05

3.6. Relationship Between Education Level and Criteria in Red Meat Purchasing Decision

Consumers having higher education prioritize freshness and products, which are not imported, more (P<0.05). Similarly, As the level of education increases, the importance given to the freshness also increases (P<0.01). Also, price sensitivity decreases with education (P<0.01). The research findings are consistent with previous studies. Wang et al. (2004) and Islam et al. (2018) stated that with the increase in the level of education, the awareness level of consumers on food and health issues increases. Gül (2010) stated lower-educated consumers may prioritize factors such as taste, convenience, and affordability over nutritional or environmental considerations.

Table 5. Kruskal-Wallis Test results for education level and criteria in red meat purchasing decision

Criteria	Education Level	Frequency	Mean	Std. Deviation	Chi-Square	P-value
Food safety	Unschooled	36	4.839	0.3187	4.1739	0.243
	Primary school	105	4.848	0.4337		
	Secondary school	131	4.893	0.3101		
	University	112	4.946	0.2262		
Appearance	Unschooled	36	4.806	0.4014	10.35438	0.016**
	Primary school	105	4.867	0.2332		
	Secondary school	131	4.885	0.2404		
	University	112	4.886	0.2074		
Smell	Unschooled	36	4.694	0.5248	8.528602	0.036**
	Primary school	105	4.819	0.3868		
	Secondary school	131	4.832	0.3952		
	University	112	4.911	0.2864		
Freshness	Unschooled	36	4.639	0.5426	26.02782	0.000*
	Primary school	105	4.733	0.4857		
	Secondary school	131	4.763	0.4443		
	University	112	4.964	0.1864		
Price	Unschooled	36	4.500	0.7746	63.3479	0.000*
	Primary school	105	4.476	0.9913		
	Secondary school	131	4.443	1.0089		
	University	112	3.545	1.1381		
Packaging feature	Unschooled	36	3.417	1.2042	6.071958	0.108
	Primary school	105	3.210	1.2145		
	Secondary school	131	3.496	1.1189		
	University	112	3.607	1.1418		
Whether fatty or not	Unschooled	36	3.750	1.0522	2.654846	0.448
	Primary school	105	3.743	1.2406		
	Secondary school	131	3.870	0.9798		
	University	112	4.063	0.7627		
Whether imported or not	Unschooled	36	3.528	0.9996	67.58495	0.000*
	Primary school	105	3.448	1.1264		
	Secondary school	131	3.344	1.1352		
	University	112	4.411	.7659		
Whether local anima or not	Unschooled	36	3.889	1.2370	14.10129	0.003*
	Primary school	105	4.143	1.1883		
	Secondary school	131	4.145	1.3134		
	University	112	4.518	1.0309		

Significance level:*P-value < 0.01; ** P-value < 0.05

4. Conclusion and Recommendations

This study investigates the red meat purchasing preferences of consumers in Iğdır Province, focusing on the interplay between socio-economic factors—such as gender, income, and education level—and purchasing decision criteria. Utilizing a survey of 384 respondents and employing nonparametric statistical tests (Mann-Whitney U and Kruskal-Wallis), the research identifies significant variations in preferences based on demographic characteristics. The findings reveal that female consumers prioritize health-oriented factors such as food safety and fat content, while male consumers exhibit greater sensitivity to price and local sourcing. Higher-income households emphasize quality attributes

like freshness and food safety, whereas lower-income groups display heightened price sensitivity. Furthermore, education level influences preferences, with more educated consumers placing greater importance on freshness and rejecting imported products. The results reinforce established consumer behavior theories that socio-economic factors such as gender, income, and education significantly influence purchasing decisions. Also, this study aligns with similar findings in Türkiye and internationally, suggesting trends in criteria for processing decision preferences.

This study contributes to the literature by underscoring the importance of tailoring marketing strategies to meet diverse consumer expectations. It was determined that the need for the red meat industry to adopt sustainable and consumer-focused approaches to address these differentiated preferences effectively. Results of the study can be used to define target market strategies for the red meat sector and to develop products and services that meet consumer expectations.

Author Contributions

The percentages of the authors' contributions are presented below. All authors reviewed and approved the final version of the manuscript.

	O.D.B.
C	100
D	100
S	100
DCP	100
DAI	100
L	100
W	100
CR	100
SR	100
PM	100
FA	100

C= concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management, FA= funding acquisition.

Conflict of Interest

The author declared that there is no conflict of interest.

Ethical Consideration

The author confirm that the ethical policies of the journal, as noted on the journal's author guidelines page, have been adhered to. The experimental procedures were approved by Scientific Research and Publication Ethics Board Chairmanship of Iğdır University (Approval date and number: 14.08.2024/No: 23).

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