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Consumption of processed meat products in adults: Relationship with food literacy and label reading habits

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ABSTRACT

The study aimed to determine the preferences for processed meat products, label-reading habits, and food literacy levels among adults. This study was conducted by conducting an online survey among 632 individuals aged 18-64 who are citizens of the Republic of Turkey, and the participants were selected using the snowball method. Data were collected using demographic information, the Food Label Reading Attitude Scale (FLRAS), and the Short Food Literacy Questionnaire (SFLQ). There were 253 males (40%) and 379 females (60%) among the participants. Their mean age was 26.0 ± 10.8 years, and their mean body mass index (BMI) was 24.52 ± 4.3 kg/m². 61.4% of the participants stated that they read food labels, and 59% of this group indicated that they did so for health reasons. Again, 66.5% of the participants consumed processed meat products. A positive and significant relationship was found between label reading attitude (FLRAS) and food literacy level (SFLQ) ($r = 0.33$, $p < 0.001$). A higher correlation was found between FLRAS and SFLQ in female participants than in male participants (female: $r = 0.38$, $p \leq 0.001$; male: $r = 0.28$, $p \leq 0.001$). Although label reading attitudes and food literacy levels were sufficient, this did not significantly affect processed meat consumption behaviour. In conclusion, although individuals had positive attitudes towards label reading and sufficient food literacy levels, this was not directly reflected in reducing processed meat consumption.

Keywords: Processed Meat Products, Food literacy, Label reading behaviours

Introduction

Food is among the physiological needs, which are the first step of human needs. Nutrition is the intake and use of the elements necessary for growth, development, and living a long, healthy, and productive life. The knowledge, attitudes, skills, and behaviours about food and nutrition can affect food selection, consumption, and nutritional patterns (Aktaş & Özdoğan, 2016). A conscious consumer is an undeniable socio-economic element that is organized, aims to get the most out of a product or service when purchasing it, takes into account actual needs, makes planned and documented purchases, has the maturity to choose a high-quality, healthy product, determines the most suitable product for its budget and gives importance to saving and also controls quality, thus gradually directing the economy towards efficiency (Hekimci, 2011). Food literacy is the ability to understand the nature of food and how important it is to learn about food, process it, access, analyse, and use data (Velardo, 2015). In other words, food literacy is defined as "a set of interrelated skills and abilities that are key to planning, managing, selecting, preparing and consuming food appropriately to achieve a balanced diet and enhance physical and mental well-being (Palumbo, 2016). To protect public health and prevent nutrition-related diseases, it is crucial to enhance the food literacy levels of individuals (Kızgın & Tuncer, 2020).

Food choice decisions are generally influenced by two motives, namely, product and process. Product motives are associated with the product's benefits to the consumer, such as price, taste, or health; process motives are related to the production and processing of the product in terms of environmental and animal welfare, fair trade, social justice, and origin. While many product features are easy to identify and evaluate at the time of purchase, process motives – for example, environmental/ethical production or the company's social responsibility – are less noticeable. Therefore, manufacturers should use a logo, seal, or eco-label to provide consumers with information about how the product is produced (Ghvanidze et al., 2019). Food labels are also essential in making the right food choices. Consumers can choose healthy eating with increased knowledge and awareness about healthy living and nutrition. This encourages a closer look at food content (Gültekin, 2019).

Food labelling is a community-based strategy that informs customers about a food's nutrient composition, empowering them to choose healthier foods. The information on the label, which includes nutritional values, production and expiration dates, ingredients, whether the product is vegetarian or not, and the price, helps consumers make informed food choices (Nayak et al., 2023). Including ingredient information on food labels helps consumers make healthier dietary decisions while also assuring food safety and product quality (Orhan, 2024). Labelling also serves as a shield against deceptive practices that conceal a product's true nature, protecting consumers from misleading packaging and advertising. However, the effectiveness of this information depends mainly on the consumer's ability to understand the labels. Ingredient lists can be technical and complex, which can alienate non-nutrition experts and highlight the need for simpler communication and consumer education (Priya & Alur, 2023).

Red meat (beef, veal, pork, lamb, and mutton) is an important source of nutrients and energy, such as essential amino acids, fatty acids, vitamins B_3, B_{12}, and D), and minerals (selenium, iron, and zinc). At the same time, fresh meat is a quickly perishable product due to its composition. Storage temperature, packaging conditions, endogenous enzymes, humidity, light, and microorganisms affect its shelf life and freshness (Wolk, 2017). Meat is generally classified as "red," "white," and "processed meat" (Taşçı, 2019). "Processed meat" includes products such as sausage, fermented sausage, salami, pastırma, ham, hamburger, canned meat, and cold cuts, and is subjected to various applications such as curing, smoking, marinating, drying, freezing, and heat treatment by adding salt, curing salt, and various additives to extend shelf life and improve taste and flavor (Jeyakumar et al., 2017; Wolk, 2017). Processing techniques applied to red and white meat have been shown to increase the formation of carcinogenic molecules. (Jeyakumar et al., 2017). Many studies emphasise that high consumption of red and/or processed meat is associated with chronic diseases such as obesity, type 2 diabetes, cardiovascular diseases, and various cancers (Taşçı, 2019). Ensuring that consumers better understand the health risks of processed meat consumption can be achieved by correctly interpreting food labels. This can be done by directing consumers to food literacy.

For this reason, the study aimed to determine the preferences for processed meat products, label-reading habits, and food literacy levels among adults. This study aimed to present original data to evaluate conscious food consumption, a critical aspect of public health, by considering the relevant variables with a holistic approach.

Materials and Methods

During the data collection process, the online survey form was disseminated through the researchers' social circles between November 2024 and February 2025; thus, access was provided to volunteer participants. According to the Turkish Statistical Institute, the population of Turkey is 85,372,377 people

(TUİK, 2024). To obtain meaningful results from the study, the sample size was determined as 384 people with a confidence level of 95% and a margin of error of ± 5% (Gürbüz & Şahin, 2016). The cross-sectional study used snowball sampling to ensure high participation. The study aimed to ensure that as many participants as possible were reached through social media platforms, regardless of variables such as gender, occupation, and city of residence.

The criteria for inclusion in the study were to be between the ages of 18 and 64, to be a citizen of the Republic of Turkey, and to participate voluntarily. In this direction, 647 people agreed to participate, and consent was obtained from these people. However, 7 participants under the age of 18 and 8 participants aged 65 and over were excluded from the study. As a result, data analysis was performed on 632 participants.

The questionnaire used in the study consisted of 25 questions about the participants' socio-demographic characteristics, developed based on a literature review by the researchers, along with questions assessing the frequency of consumption of processed food products sold in the market. The remaining part of the questionnaire included two validated and reliable Turkish-language scales: the Food Label Reading Attitude Scale and the Short Food Literacy Questionnaire (Durmus et al., 2019; Demir, 2023; Orhan, 2024; Seçkin Sığırcı & Ziver Sarp, 2024).

Body mass index (BMI) levels were calculated by using the information about the body weight (kg) and height (m) of the individuals. The classification of BMI followed the guidelines established by the World Health Organisation, and individuals were grouped into the following categories: underweight as 18.50 kg/m², normal as 18.50–24.99 kg/m², 25.00-29.99 kg/m² as pre-obese and 30.00 kg/m² or higher as obese (WHO, 2025)

The Food Label Reading Attitude Scale (FLRAS), consisting of 20 items in a five-point Likert-type scale, was developed by Seçkin Sığırcı and Ziver Sarp (2024), and its reliability and validity were established. The responses given to the items in the scale were scored as "strongly disagree=1", "disagree=2", "undecided=3", "agree=4" and "strongly agree=5". As the score obtained from the scale increases, it is evaluated that the attitude toward reading food labels increases. The minimum score that can be obtained from the scale, consisting of twenty questions and without a cut-off point, is 20, while the maximum score is 100. The Cronbach's alpha coefficient was 0.94 for FLRAS (Seçkin Sığırcı & Ziver Sarp, 2024).

The short Food Literacy Questionnaire (SFLQ was developed by Krause et al. (2018). The reliability and validity of this scale, which covers essential elements of food literacy definitions, were examined in Turkish by Durmuş et al. (2019). The responses given to 4 questions (2.a, 2.b., 2.c, 2.d., 2.e, 3., 7. and 8.) of the scale consisting of 12 Likert-type questions are scored between 0-5, while the other questions are scored between 0-4. The minimum score that can be obtained from the scale is 7, while the maximum score is 52 points (Durmus et al., 2019). The cut-off score for the Short Food Literacy Scale was established at 31, whereby a total score of ≥ 31 denotes adequate food literacy, and a score of < 31 denotes inadequate food literacy (Gökler et al., 2020). Since the 50th percentile value of the individuals' food literacy score was determined as 31 in this study, the intercept values suggested by Gökler et al. (2020) were used.

The results were evaluated using the SPSS-26 (Statistical Package for the Social Sciences) statistical package program. Descriptive statistics, frequency, and percentage values were given for categorical variables (demographic characteristics) in the obtained data. The control of the suitability of numerical variables for normal distribution was performed with the "Shapiro-Wilk Test," and the descriptive statistics of numerical variables were given as mean ± standard deviation ($\bar{X}$ ± SD) for data showing normal distribution and median (min-max) values for data not showing normal distribution. The chi-square test was used to examine the difference between the categorical data of two independent groups. A p-value of less than 0.05 was considered statistically significant.

The study was approved by the Afyonkarahisar Health Sciences University Non-Interventional Clinical Research Ethics Committee during meeting number 2024/396 on November 1, 2024.

Results and Discussion

A total of 632 individuals participated in the study, comprising 379 females (60%) and 253 males (40%). The participants' mean age was 26.0 ± 10.8 years, and the mean BMI was 24.5 ± 4.3 kg/m². According to the BMI classification, 48.7% of the individuals (n=308) were of normal weight, while 35.0% (n=221) were considered pre-obese. Most of the participants were university students (37.8%). When their income-expenditure status was examined, 64.1% (n=405) of the individuals stated that their income was equal to their expenses. When the ratio of the participants' monthly income allocated to food was evaluated, 47.0% (n=297) stated this ratio was between 25% and 50%, and 29.6% said it was between 50% and 75%. Additionally, when asked about the proportion of monthly food expenditures allocated to processed products, 67.2% (n=425) stated this proportion as 0-25%, while only 1.9%

(n=12) reported that processed meat product expenditures constituted 75-100% of total food expenditures (Table 1).

According to Table 2, 63.4% (n=401) of the participants stated that they have a habit of eating fast food or out-of-home eating. 7.9% (n=50) of this group said that they consume fast food or eat out daily, and 8.4% (n=53) stated that they consume fast food or eat out only once a year. Reasons for consuming fast food or out-of-home eating include lack of time (18.8%), liking it (21.7%), practicality (18.0%), and special day or celebration (4.9%). Additionally, 85.9% of the participants (n=543) reported familiarity with processed meat products, and 66.5% (n=420) indicated consuming such products.

Table 1. Socio-demographic characteristics of participants

Variables	n (632)	% (100)
Gender		
Male	253	40.0
Female	379	60.0
Age ($\bar{X}$ ± SD)	26.0 ± 10.8	
BMI ($\bar{X}$ ± SD)	24.5 ± 4.3	
BMI Classification		
Underweight (<18.5 kg/m^2)	61	9.7
Normal (18.5 – 24.9 kg/m^2)	308	48.7
Pre-obese (25.0-29.9 kg/m^2)	221	35.0
Obese (≥30.0 kg/m^2)	42	6.6
Occupation		
Unemployed	29	4.6
Undergraduate	239	37.8
Housewife	80	12.7
Employee	32	5.1
Public servant	146	23.1
Private sector	54	8.5
Self-employed	37	5.9
Retired individuals	15	2.3
Level of income		
Income is lower than expenses	173	27.4
Expenses are the same as income	405	64.1
Income is higher than expenses	54	8.5
What percent of your monthly food expenses is income		
% 0-25	118	18.7
% 25-50	297	47.0
% 50-75	187	29.6
%75-100	30	4.7
What percent of your monthly food expenses are processed meat products		
% 0-25	425	67.2
% 25-50	155	24.5
% 50-75	40	6.3
%75-100	12	1.9
Diagnosed Disease		
Have a diagnosed disease	119	18.8
Not diagnosed with any disease	513	81.2
Special diet for a disease		
Follow a diet	70	11.1
Do not follow a diet	562	88.9

Table 2. Participants' Fast-Food Habits and Processed Meat Consumption

Variables	n (632)	% (100)
Fast food/out-of-home eating		
Yes	401	63.4
No	231	36.6
Frequency of consuming Fast food/out-of-home eating	**n (401)**	**% (100)**
Daily	50	7.9
3-4 times a week	84	13.3
Once a week	64	10.1
Once every 15 days	81	12.8
Once a month	69	10.9
Once a year	53	8.4
Why do we consume fast food/out-of-home		
Lack of time	119	18.8
I like it	137	21.7
Practical	114	18.0
Celebration	31	4.9
Knowledge of processed meat products	**n (632)**	**% (100)**
Yes	543	85.9
No	44	7.0
I'm not sure	45	7.1
Processed meat products consumption status		
Yes	420	66.5
No	212	33.5

According to Table 2, a significant portion of the participants have the habit of eating fast food or out-of-home eating. It is seen that factors such as time constraints, the search for practicality, and personal tastes are effective in forming this tendency. Gültekin (2019) emphasised that the low level of food label reading habits, especially among adolescents, is related to fast and practical nutrition preferences. Similarly, Orhan (2024) states that the tendency towards processed products has increased due to the intense pace of modern life and that understanding the contents of these products is critical for healthy nutrition. In the study by Yücel (2020), time constraints were the most frequent reason given by college students for skipping meals. This finding is consistent with the fact that factors such as 'lack of time' and 'practicality' were prominent among our study's main reasons for choosing fast food or out-of-home eating. It has been determined that consumers are less likely to use nutrition labels, especially when under time pressure or making decisions based on their shopping habits. This supports the explanation of our study's fast-food or out-of-home eating preferences as practicality and lack of time (Grunert & Wills, 2007).

Participants were asked about the frequency of consuming various processed meat products, and the findings are presented in Table 3. It was observed that sausage, salami, ham, and dried/smoked meat products were generally preferred at a low rate. On the other hand, sucuk, which is widely consumed in Turkish culture, was preferred at a higher rate. Of the 206 participants, 32.7% reported consuming sucuk 3-4 times each week. A similar trend was observed in other products widely consumed in society, such as meat/chicken doner and ready-made meatballs. The rate of those who consume prepackaged beef doners 3-4 times a week was 22.9%, 21.2% for prepackaged chicken doners, and 25.6% for prepackaged meatballs.

Table 3. Frequencies of consuming various processed meat products by participants

Processed Meat Products	Never		Daily		3-4 times a week		Once a week		Once every 15 days		Once a month		Once a year	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Fermented Sausage (Sucuk)	83	13.1	9	1.4	206	32.7	95	15.0	82	13.0	97	15.3	60	9.5
Beef Sausage	255	40.4	9	1.4	90	14.2	59	9.3	53	8.4	79	12.5	87	13.8
Turkey Sausage	269	42.6	6	0.9	87	13.8	52	8.2	48	7.6	87	13.8	83	13.1
Chicken Sausage	277	43.8	5	0.8	102	16.1	51	8.1	46	7.3	77	12.2	74	11.7
Beef Salami	279	44.0	9	1.4	84	13.3	51	8.1	44	7.0	73	11.6	92	14.6
Turkey Salami	316	50.0	7	1.1	75	11.9	44	6.9	41	6.5	65	10.3	84	13.3
Chicken Salami	285	45.1	9	1.4	90	14.2	52	8.2	51	8.1	56	8.9	89	14.1
Beef Ham	316	50.0	6	0.9	75	11.9	42	6.6	36	5.8	62	9.8	95	15.0
Turkey Ham	320	50.7	6	0.9	73	11.6	42	6.6	40	6.3	61	9.7	90	14.2
Pastırma	258	40.8	4	0.6	94	14.9	38	6.0	37	5.9	90	14.2	111	17.6
Dried Meat	304	48.1	7	1.1	81	12.8	40	6.3	42	6.6	63	10.0	95	15.0
Smoked Meat	301	47.6	9	1.4	84	13.3	43	6.8	38	6.0	70	11.1	87	13.8
Kavurma	168	26.6	10	1.6	145	22.9	56	8.9	69	10.9	101	16.0	83	13.1
Prepackaged Beef Doner	161	25.5	16	2.5	134	21.2	62	9.8	76	12.0	103	16.3	80	12.7
Prepackaged Chicken Doner	139	22.0	16	2.5	162	25.6	65	10.3	76	12.0	104	16.5	70	11.1
Prepackaged Meatball	191	30.3	16	2.5	120	19.0	63	10.0	79	12.5	85	13.4	78	12.3
Prepackaged Beef Burger	234	37.0	16	2.5	101	16.0	51	8.1	55	8.7	87	13.8	88	13.9
Prepackaged Chicken Burger	262	41.4	13	2.1	98	15.5	51	8.1	55	8.7	76	12.0	77	12.2
Prepackaged Chicken nugget	231	36.6	10	1.6	103	16.3	46	7.3	57	9.0	97	15.3	88	13.9
Prepackaged Chicken Schnitzel	243	38.5	13	2.1	93	14.7	46	7.3	59	9.3	83	13.1	95	15.0

Table 3 shows that while the consumption of products such as sausage, salami, and ham remains limited, products such as sucuk and döner, which are widely consumed in Turkish culture, are preferred more frequently. As Taşçı (2019) also stated, this situation shows that cultural eating habits and taste preferences are decisive in consuming processed meat products. Consuming products such as sucuk and prepackaged meatballs 3-4 times a week is a situation that should be considered in terms of public health.

Table 4 shows that 61.4% of participants have the habit of reading food labels, and the most common reason for this behaviour is health concerns (59%). Of those who don't read labels, 36.5% said they have trouble comprehending the information. This result is consistent with the findings in the study of Kızgın and Tuncer (2020) that small fonts and technical expressions on labels are incomprehensible to consumers. Similarly, the study by Yalçın and Sevim (2024) determined that individuals' attitudes toward reading food labels were generally high. Still, they focused more on expiration date, production date, and shelf life rather than content information. It was observed that participants' label-reading behaviours were mainly concentrated when purchasing the product for the first time or when making comparisons between different brands. This finding supports our study's results in showing the consumer profile that uses the label only for instant decisions and gives secondary importance to content analysis.

As shown in Table 4, FLRAS was administered to 388 individuals who self-reported reading food labels, with the mean score determined as 78.4 ±0.9 (min. 20 – max. 100). Yalçın and Sevim (2024) reported a mean FLRAS score of 76.4 ±17.6 in their study on adults. In contrast, Baş and Kayak found a mean total score of 71.15 ±15.6 in their study conducted on university students. The total mean SFLQ score was determined as 33.7 ±0.3 (min. 15.2 – max. 52). In studies conducted using the SFLQ, Krause et al. (2018) reported a mean score of 37.2 ±6.3 for the Swiss population, while Zeminian et al. (2022) reported a slightly lower mean score of 33.2 ±7.9 for

the Brazilian population. Mustuloğlu et al. (2024) reported a mean SFLQ score of 37.6 ±5.7 in their study conducted with dental students. This comparison suggests that although participants in the present study showed stronger attitudes toward food label reading, their overall food literacy levels appear to be relatively moderate.

As shown in Table 5, processed meat product consumption was evaluated by reading the food label and the SFLQ. Of the 388 individuals who reported reading food labels, 249 (64.7%) stated they consumed processed meat products. In contrast, among those who reported not reading food labels, 73 (29.9%) indicated that they did not consume processed meat products. However, the association between food label reading and processed meat products was not statistically significant ($p > 0.05$). According to the SFLQ scores, 291 out of 455 individuals (69.3%) with adequate food literacy reported consuming processed meat products. Among those with inadequate food literacy (n = 177), 48 individuals (22.6%) reported not consuming processed meat products. The association between processed meat product consumption and food literacy level, as measured by the SFLQ, was also not statistically significant ($p > 0.05$).

Table 4. Participants' food label reading and food literacy characteristics

Variables	n (632)	% (100)
Reading Food labels		
Yes	388	61.4
No	244	38.6
Why read food labels?	**n (388)**	**% (100)**
For health reasons	229	59.0
For religious reasons	12	3.1
For my interest	130	33.5
For expiration dates	17	4.4
Why don't I read food labels?	**n (244)**	**% (100)**
I know the product	27	11.1
I don't trust what is written	39	15.9
Hard to understand label information	89	36.5
The writing is too small	52	21.3
I don't want to know the content	37	15.2
	Mean±Std	**min. – max.**
FLRAS (n = 388)	78.4 ± 0.9	20 – 100
SFLQ (n = 632)	33.7 ± 0.3	15.2 – 52

FLRAS: Food Label Reading Attitude Scale; SFLQ: Short Food Literacy Questionnaire

Table 5. Processed meat products by label reading and food literacy

		Processed meat products consumption status				
		Yes	**%**	**No**	**%**	**p-value**
Reading Food labels	Yes	249	64.7	139	35.3	0.126
	No	171	70.1	73	29.9	
SFLQ	inadequate food literacy (SFLQ<31)	129	30.7	48	22.6	0.390
	adequate food literacy (SFLQ≥31)	291	69.3	164	77.4	

FLRAS: Food Label Reading Attitude Scale; SFLQ: Short Food Literacy Questionnaire
$p < 0.05$

The relationship between the participants' FLRAS and SFLQ scores was evaluated with Pearson correlation analysis. The correlation coefficient was interpreted as follows: 0.00 (no relationship), 0.01–0.29 (low-level relationship), 0.30–0.70 (moderate relationship), 0.71–0.99 (high-level relationship), and 1.00 (perfect relationship) (Köklü et al., 2024). The findings revealed statistically significant relationships between individuals' attitudes toward food labels and their general food literacy levels (Table 6).

In the analysis conducted according to gender, a moderately positive and significant relationship was determined between FLRAS and SFLQ in female participants ($r = 0.38$, $p \leq 0.001$). In male participants, this relationship was found to be low but statistically significant ($r = 0.28$, $p \leq 0.001$). Females take a more active role in shopping and are more sensitive to health-related issues, which may explain why this correlation is higher in females. When examined according to education level, A moderate positive and significant correlation was found between FLRAS and SFLQ in primary/middle school ($r = 0.56$, $p < 0.001$), high school ($r = 0.38$, $p < 0.001$) and associate degree ($r = 0.43$, $p < 0.001$) graduates. This relationship was low in bachelor's degree ($r = 0.30$, $p < 0.05$). No statistically significant relationship was found in master's ($r = 0.11$, $p > 0.05$) and doctorate ($r = 0.20$, $p > 0.05$) levels. This result shows that in individuals with lower levels of education, the attitude toward reading food labels may be more decisive in general food literacy. On the other hand, in individuals with higher levels of education, the fact that food literacy is affected by different sources of information (scientific publications, academic education, etc.) may cause the relationship between FLRAS and SFLQ to be weaker in this group (Table 6).

Table 6. Correlation analysis of the relationship between FLRAS and SFLQ based on demographic and behavioural factors

		SFLQ	
		r	***p***
FLRAS	***Gender***		
	Female	0.38**	p = 0.001
	Male	0.26**	p = 0.001
	Last School Graduated		
	Primary/Middle School	0.56***	p = 0.000
	High School	0.38***	p = 0.000
	Associate's degree	0.43***	p = 0.000
	Bachelor's degree	0.30***	p = 0.000
	Master's degree	0.20	p = 0.670
	Processed meat products consumption status		
	Yes	0.32***	p = 0.000
	No	0.37***	p = 0.000
	Reading Food Labels		
	Yes	0.23***	p = 0.000
	No	-0.13*	p = 0.045

Pearson correlation test *p<0.05, **p<0.01, ***p<0.001
FLRAS: Food Label Reading Attitude Scale; SFLQ: Short Food Literacy Questionnaire

When evaluated with processed meat consumption status, a moderate positive and significant correlation was found between FLRAS and SFLQ in both individuals who consume processed meat ($r = 0.32$, $p < 0.001$) and individuals who do not eat it ($r = 0.37$, $p < 0.001$). A moderate positive and significant correlation was found between FLRAS and SFLQ. This finding shows that, regardless of individuals' processed meat consumption, their label-reading attitudes are related to their food literacy. Label reading habits may affect which products individuals prefer and may also indicate their level of awareness about food content. Regarding food label reading behaviour, a positive, weak, and significant correlation was found between FLRAS and SFLQ in individuals who read labels ($r = 0.23$, $p < 0.001$). On the other hand, a negative, weak correlation was found between FLRAS and SFLQ in individuals who stated that they do not read food labels ($r = -0.13$, $p < 0.05$). This situation shows that label reading behaviour supports food literacy, while this literacy level may be lower in individuals who do not read labels. In addition, individuals

who do not read labels tend to score lower on the FLRAS, which may also reflect differences at the attitudinal level (Table 6).

This study evaluated the relationship between individuals' attitudes toward food labels and food literacy levels, and significant positive correlations were found. The findings, especially in the context of the gender variable, show that female participants have a higher correlation value between FLRAS and SFLQ scores than males. This result is consistent with the findings of previous studies that female individuals are more interested in and sensitive to health, nutrition, and food safety issues (Campos et al., 2011; Svendsen et al., 2021). Yücel (2020) revealed that females have higher nutritional knowledge levels than males and attach more importance to healthy nutrition. This is consistent with the stronger correlation between FLRAS and SFLQ in female participants in our study. Females taking a more active role in the food purchasing and preparation processes at home may be reflected more in their label-reading behaviours.

In the evaluations made according to education level, moderate positive correlations were observed between FLRAS and SFLQ, especially in participants with lower than high school and associate degrees. On the other hand, the fact that this relationship is weak and statistically insignificant at the master's and doctorate levels suggests that food literacy develops in these groups without being dependent only on label-reading attitudes. Individuals with higher levels of education have more access to academic information sources, which can be explained by the involvement of different variables that shape their knowledge levels. Some studies have reported no direct parallelism between an individual's knowledge level and their attitudes, and that as their level of education increases, different sources of information and cognitive processes begin to be effective (Krause et al., 2018).

Regarding the processed meat consumption variable, similar (moderate) and significant correlations were found between FLRAS and SFLQ in both consuming and non-consuming individuals. This shows that label-reading attitude is associated with food literacy, independent of processed meat consumption behaviour. Since label reading behaviour provides clues about which products individuals prefer and why, it may also reflect their tendency to obtain information, especially about processed products (Nohlen et al., 2020)

When the relationship between food label reading behaviour and FLRAS and SFLQ is examined, a positive and weak correlation is found in individuals who read the label. On the other hand, the correlation was negative in individuals who stated that they did not read the label. This finding suggests that individuals' label-reading behaviour supports food literacy, while individuals who lack this behaviour may have negative attitudes toward labels. It has been reported that label reading behaviour is related to the purpose of obtaining information and the motivation to make healthy choices (Grunert & Wills, 2007). Yücel's (2020) study also found that despite the students' high knowledge levels, they continued to skip meals, consume fast food, and have irregular eating behaviours. This is an important point that explains the high level of processed meat consumption despite the positive attitude towards labels and sufficient food literacy in our study. When evaluated in general, the study's correlation findings reveal positive and significant relationships between individuals' attitudes toward food labels and their general food literacy levels. These results show that encouraging label reading habits can increase food literacy, thus contributing to the development of healthy eating behaviours. Label reading habits are related to accessing information and using it. As stated in the study of Yalçın and Sevim (2024), even if individuals have a positive label-reading attitude, this attitude is not supported by awareness at the content level, limiting the functionality of label literacy. Although individuals' label-reading attitudes and food literacy were sufficient, no significant decrease in processed meat consumption was observed. This supports Grunert and Wills's (2007) finding that although consumers report understanding label information, this does not necessarily translate into changes in purchasing behaviour. This finding is consistent with our study; although individuals' label-reading attitudes and food literacy were sufficient, no significant decrease in processed meat consumption was observed.

This study has some limitations. Since it has a cross-sectional design, causal relationships between the variables cannot be interpreted. In addition, since the study sample represents a specific socio-demographic profile, the generalizability of the findings may be limited. Further research supported by qualitative methods is needed to understand better the relationship between label reading attitude and food literacy.

Conclusion

This study shows that individuals' food label reading habits and literacy levels are generally positive, but this situation is not always reflected in healthy eating behaviours. While access to label information and the ability to make sense of this information are determinants of individuals' food preferences, factors such as time pressure, habits, and cultural factors can limit the transformation of this information into behaviour.

The research results reveal significant relationships between label reading attitudes and food literacy, and that demographic

variables, especially gender and education level, can affect this relationship. In this context, the study makes important contributions to the literature by considering the multidimensional structure of consumer behaviour.

Designing future studies with holistic approaches that examine the level of knowledge and how this information is transformed into behaviour can make the information obtained from the label more functional.

Compliance with Ethical Standards

Conflict of interest: The author(s) declare that they have no actual, potential, or perceived conflicts of interest related to this article.

Ethics committee approval: The study was approved by the Afyonkarahisar Health Sciences University Non-Interventional Clinical Research Ethics Committee during meeting number 2024/396 on November 1, 2024.

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