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Investigation of Milk Consumption Preferences of Kırşehir Ahi Evran University Students Using Logistic Regression

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ABSTRACT

The consumption of milk and dairy products plays a significant role in human health. As fundamental components of dietary culture, the importance of understanding consumer preferences and evaluating consumption habits of milk and dairy products has been extensively recognized in the literature. This study aims to examine the milk and dairy product consumption habits of students at Kırşehir Ahi Evran University and to identify the factors affecting these preferences through logistic regression analysis. The research involved the analysis of data collected via surveys from 313 students across various faculties. Specifically, 72.8% of participants reported consuming milk, whereas 27.2% stated that they did not. Among milk consumers, the majority preferred pasteurized milk and prioritized factors such as brand, price, and expiration date when making purchasing decisions. According to the results of the logistic regression analysis, class level ($p = 0.001$), age ($p = 0.031$), habit of drinking milk ($p < 0.001$), daily milk consumption amount ($p < 0.001$), preference for milk type ($p = 0.005$), awareness of the nutritional value of milk ($p = 0.003$), and factors considered when purchasing milk ($p = 0.012$) were found to be statistically significant predictors of university students' milk consumption behavior ($p < 0.05$). These results suggest that milk and dairy product consumption habits are not solely determined by individual preferences but are also influenced by broader economic and social factors.

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Introduction

Healthy nutrition is one of the fundamental elements that enhance individuals' quality of life by preserving their physical and mental health. Milk and dairy products, as a critical component of healthy nutrition, are food groups that maintain their importance across all stages of life, particularly during childhood, due to their high-quality nutritional content (Pereira, 2014; Lambrini et al., 2021). Milk is recognized as an essential food product in human nutrition not only because it is a rich source of protein and calcium but also due to its abundance in vital vitamins and minerals such as phosphorus, zinc, B1 (thiamine), B2 (riboflavin), B6, B12, and niacin (Pereira & Vicente, 2017). Additionally, fat-soluble vitamins A, D, E, and K are found in milk fat, and any reduction in milk fat content directly affects the levels of these vitamins (Alkın, 2008). Thanks to its high-quality protein, calcium, phosphorus, zinc, and B vitamins, milk and dairy products are recommended for individuals of all age groups (Kapaj & Deci, 2017). Calcium, in particular, plays a critical role in bone health, significantly contributing to the formation of bone mass from childhood through late adolescence and into early adulthood (Pereira & Vicente, 2017). Moreover, milk consumption in adulthood has been associated with important health benefits, such as the prevention of cardiovascular diseases, weight management, and the reduction of metabolic syndrome risk. Milk is also known to exhibit antioxidant, antimicrobial, and antihypertensive effects due to its bioactive peptides. The regular consumption of milk and dairy products by individuals of all age groups is recommended as part of a balanced and adequate diet to support overall health and well-being.

University students, as a significant consumer group within society, often deviate from healthy dietary patterns due to the demands of intensive academic schedules and irregular eating habits. Such deviations frequently result in reduced consumption of milk and dairy products, potentially leading to adverse effects on growth, development, and bone health in young individuals. Encouraging young people to adopt lifelong healthy and informed eating behaviors holds strategic importance for the improvement of public health. In this context, research aimed at understanding the milk consumption habits of university students and the factors affecting these behaviors can provide valuable contributions to the

formulation of effective nutritional policies. Such studies offer critical insights for promoting healthier dietary practices and addressing nutritional deficiencies within this demographic.

In recent years, numerous studies have employed statistical methods to explore the behavioral, socioeconomic, and demographic factors influencing milk consumption among university students (Onurlubaş & Çakırlar, 2016). Derin and Emdirme (2012) identified low consumption and limited awareness of fermented milk products such as kefir and probiotics, and reported the need to raise awareness of their health benefits. Maryam et al. (2019) demonstrated that nutritional education significantly improved students' knowledge, attitudes, and milk consumption practices. Similarly, Stearns and Rabinowitz (2021) observed a decline in milk consumption and emphasized the potential of educational programs to reshape beverage preferences and promote healthier choices. Kim et al. (2016) found a positive association between milk consumption and academic performance, learning strategies, and certain personality traits among male adolescents, though no such link was observed among females. Kumbasaroğlu and Erem Kaya (2020) noted that taste, odor, and price affected students' irregular milk consumption habits, with preferences shaped by individual perceptions. Using the Theory of Planned Behavior, Baghianimoghadam et al. (2016) emphasized the role of beliefs and perceived control in milk consumption, suggesting that education and accessibility could foster regular intake. Güler et al. (2021) reported insufficient daily milk consumption despite high usage of packaged dairy products, while Çetinkaya (2010) reported limited awareness of milk's nutritional benefits, with students favoring cheese and yogurt over milk.

Logistic regression analysis has been widely employed in scientific studies investigating milk consumption. This multivariate statistical method is particularly effective in examining relationships between variables when the dependent variable is binary (e.g., 0-1). Numerous studies in the literature have utilized this approach to evaluate regressive relationships within multivariate data structures related to milk consumption behaviors. Bal (2013) investigated consumer characteristics influencing preferences for organic milk consumption in Tokat province. The study found that concerns related to environmental degradation, pesticide and hormone residues in food products, and animal welfare significantly increased interest in organic milk products. Using a binary logit model, the research determined that factors such as the education level of homemakers, household income, the presence of an employed spouse, knowledge about organic products, and household size had statistically significant effects on organic milk consumption. The study concluded that enhancing awareness about organic products and encouraging organic milk production are critical strategies for increasing consumption. Additionally, this was noted to offer significant potential for boosting both domestic demand and the export market for organic products. Silva et al. (2019) employed logistic regression to examine socio-demographic and behavioral factors associated with inadequate milk consumption—defined as not consuming milk on at least one day per week—among adolescents. The study found that 58.9% of participants consumed milk inadequately and emphasized the need for multi-level interventions targeting dietary behavior. Widiati et al. (2013) investigated socio-economic determinants of milk consumption in households with children in Yogyakarta using binomial logistic regression and log-linear models. The results identified milk prices and mothers' education as key factors, with younger children more likely to consume milk regularly. The study recommended programs to improve maternal education and income, particularly in low-income rural areas. Lanfranchi et al. (2017) applied stepwise logistic regression to assess consumer attitudes toward conventional and specialty milk, particularly donkey milk, in Italian supermarkets. While affordability and accessibility drove general milk preferences, specialty milk consumption was linked to health needs such as allergies or intolerances. Age and health conditions were found to be significant predictors, while high prices limited purchase frequency. Herber et al. (2020) used logistic regression to analyze data from Demographic and Health Surveys (1990–2017) across low- and middle-income countries, assessing the relationship between milk consumption and child growth. Findings revealed positive associations between milk consumption and reduced risks of stunting, wasting, and underweight, highlighting milk's role in child nutrition and development. Paraffin et al. (2017) examined milk product preferences and safety perceptions using logistic regression in urban and rural households. Urban households prioritized product quality and nutritional value, while rural households valued affordability and access, often sourcing milk directly from vendors. Urban participants demonstrated higher milk safety awareness, indicating disparities in information access.

In this study, various demographic, socio-economic, and consumption-related factors influencing milk consumption among university students are evaluated through the application of logistic regression analysis. In contrast to previous research that has predominantly relied on descriptive statistics or bivariate analyses, a multivariate framework is employed to identify statistically significant predictors of milk consumption behavior. By utilizing logistic regression, a comprehensive and analytically approach of the underlying variables associated with consumption habits is provided. The explanatory strength of the findings is stated by estimating the individual effect of each variable within a unified model. Accordingly, by employing multivariate statistical methods, a quantitative perspective on milk consumption behavior among university students is provided, through which a contribution to the existing literature is intended.

Materials and Methods

The data used in this study were collected through face-to-face interviews with 313 undergraduate students, using a questionnaire designed to examine their milk consumption habits, reasons for preferences, and influencing factors. The Ethics Committee approval was obtained from the Social and Humanities Scientific Research and Publication Ethics Committee of Kırşehir Ahi Evran University (Date: 08.01.2025, No: 2025/01/06). The questionnaire comprises 15 questions aimed at assessing the students' demographic characteristics

(faculty, academic year, age, gender, place of residence, and income level) and their milk consumption habits. The questions evaluate participants' attitudes toward milk consumption, including their milk-drinking habits, frequency of consumption, preferred type of milk, and the animal source of the milk. Additionally, factors considered during milk purchasing, such as brand, price, and expiration date, as well as participants' perceptions of milk pricing and knowledge about its nutritional value, were assessed. The questionnaire also gathered participants' perspectives on factors that encourage milk consumption and their opinions aimed at increasing milk consumption. The survey text was prepared by the researchers after a detailed literature review. The analysis of the study was carried out using frequency tables, descriptive statistics and logistic regression analysis. All analyses were conducted using the SPSS (Statistical Package for Social Sciences) version 26.0 software.

Statistical Analysis

Logistic regression is a widely utilized multivariate statistical analysis method in consumer research, employed to model the relationship between a binary or multinomial dependent variable (e.g., consumption behavior versus non-consumption behavior) and one or more independent variables. Independent variables can be continuous or discrete in nature, encompassing demographic, socio-economic, and behavioral characteristics that offer detailed insights into consumer perceptions. In consumer research, logistic regression analysis has been effectively applied to various domains, including understanding complex consumer behaviors, informing marketing strategies, modeling purchasing decisions in product development studies, evaluating customer satisfaction, examining repeat purchasing behaviors, and identifying consumer segments.

In this study, logistic regression analysis was applied to evaluate the factors affecting the likelihood of milk consumption among university students. Furthermore, the analysis aimed to determine which demographic or psychographic variables are significantly associated with a higher probability of milk consumption. In the analyses, the dependent variable was defined as milk consumers (1) and non-consumers (0). Logistic regression analysis is a widely used method for modeling relationships between variables when the dependent variable has two or more categorical levels. Unlike linear regression, where the dependent variable is directly predicted, logistic regression estimates the probability of the dependent variable taking the value "1." In this context, the event of interest, represented by "1," corresponds to the categorical occurrence of the dependent variable. In logistic regression, the assumption of homoscedasticity (equal variance), which is required in linear regression analysis, does not apply, the maximum likelihood estimation (MLE) method is typically preferred for parameter estimation (Ohlmacher et al., 2003). This method seeks to maximize the probability of the observed event occurring. The values that maximize the likelihood function, constructed to estimate unknown parameters, are referred to as maximum likelihood estimators. Multiple independent variables can be included in a multiple logistic regression model to investigate their effects on the dependent variable. Let p represent the number of variables in the model and $x = (x_1, x_2, \dots, x_p)$ denote the vector of independent variables. The mathematical representation of multiple logistic regression is given in Equation 1 (Alpar, 2011).

$$\pi(x) = P(Y = 1|x) = \frac{e^{(\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_p x_p)}}{1 + e^{(\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_p x_p)}} = \frac{1}{1+e^{-(\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_p x_p)}} \quad (1)$$

$$\frac{\pi(x)}{1-\pi(x)} = e^{\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_p x_p} \quad (2)$$

$$logit\pi(x) = \ln\left(\frac{\pi(x)}{1-\pi(x)}\right) \quad (3)$$

The multiple logistic regression model is expressed in terms of the odds of the dependent variable, as shown in Equation 2. The logit transformation, which involves taking the natural logarithm of the odds, is presented in Equation 3. Applying the logit transformation converts the multiple logistic regression model into a linear model, with its mathematical representation provided in Equation 4(Hosmer and Lemeshow, 2000). Here, the probability of $Y = 1$ given a known $X = x$ is denoted as $P(Y = 1|x) = \pi(x)$. The logit transformation is a linear function of the β parameters, where β_0 represents the intercept and β_1 represents the slope coefficient. The slope coefficient β_1 quantifies the change in the logit resulting from a one-unit change in the independent variable.

$$g(x) = \ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p \quad (4)$$

In this study, the enter method was employed for logistic regression model analysis, and the significance of the variables included in the model was assessed using the Wald test. A higher Wald value indicates greater significance of the variable (Chan, 2004; Önder, 2013). To evaluate the goodness-of-fit of the predictive model, the Hosmer-Lemeshow test was utilized (Hosmer & Lemeshow, 2000). Additionally, the interpretation of odds ratios in the logit model was included in the analysis. The odds ratio is defined as the ratio of the number of occurrences of an event to the number of non-occurrences (Menard, 2010; Karabaş & Gürler, 2012). In logistic regression analysis, $Exp(\beta)$ values represent the odds ratios of the independent variables. These odds ratios explain the effect of a one-unit change in an independent variable on the likelihood of the dependent variable (milk consumption) occurring. The significance level (Type I error) was set at 0.05 ($p < 0.05$).

Results

The results of the study initially present demographic variables of university students, including their faculty, academic year, age, gender, and place of residence, using frequency tables. Demographic characteristics of the participating students are summarized in Table 1. The average age of the students was calculated as 21.07 years. Regarding gender distribution, 66.1% of the students were female, while 33.9% were male.

Table 1. Demographic characteristics of university students

Variables		Frequency	%
Gender	Female	207	66.1
	Male	106	33.9
Faculty	Education	32	10.2
	Science	30	9.6
	Economics and Administrative Sciences	56	17.9
	Islamic Sciences Faculty	52	16.6
	Engineering and Architecture Faculty	27	8.6
	NEGSF	18	5.8
	Health Sciences Faculty	33	10.5
	Medical Faculty	28	8.9
	Agriculture Faculty	37	11.8
Class	1	37	11.8
	2	150	47.9
	3	22	7.0
	4	104	33.2
Living Place	Dormitory	212	67.7
	Student House	70	22.4
	Family House	31	9.9

The distribution of students across faculties is as follows: 10.2% were enrolled in the Faculty of Education, 9.6% in the Faculty of Arts and Sciences, 17.9% in the Faculty of Economics and Administrative Sciences, 16.6% in the Faculty of Islamic Studies, 8.6% in the Faculty of Engineering and Architecture, 5.8% in the Neşet Ertaş Faculty of Fine Arts, 10.5% in the Faculty of Health Sciences, 8.9% in the Faculty of Medicine, and 11.8% in the Faculty of Agriculture. The majority of students were found to reside in state dormitories.

Information regarding the factors affecting milk consumption among university students is summarized in Table 2. The results indicate that a significant majority of students (72.8%) do not have a regular milk consumption habit. Among those who do, 62.3% reported acquiring this habit during childhood. Additionally, 81.5% of students consume cow's milk, and 57.2% prefer pasteurized milk. Regarding the perceived price of milk, 46.6% of students considered it reasonably priced, while 44.4% found it expensive. A majority of students (45.4%) stated that they consider all three factors—brand, price, and expiration date—when purchasing milk. In terms of milk fat preferences, 57.8% of students reported consuming semi-skimmed milk.

Opinions on the nutritional value of milk were divided, with 56.5% expressing positive perceptions and 43.5% expressing negative perceptions. Habits acquired in the past were identified as the primary factor affecting milk consumption preferences for 80.5% of the students. Among dairy products other than milk, students most frequently consumed ayran (a traditional yogurt-based beverage). This preference appears to be affected by students' economic conditions and product pricing.

During the process of obtaining the research results, the assumptions for logistic regression analysis were first evaluated. In the initial step, the distribution of respondents across the categories in the survey questions was reviewed using cross-tabulations. It was determined that the number of participants within each category of the independent variables was adequate.

In the second step, the presence of multicollinearity was examined. The analysis revealed that the variance inflation factor (VIF) values were below 10, the condition index values were almost entirely below 30, and the tolerance values were greater than 0.10. These results indicate that multicollinearity among the independent variables was not a concern (Menard, 2010; Tabachnick and Fidell, 2007). To proceed with the logistic regression analysis, the linearity of continuous independent variables was assessed, and no significant deviations from linearity were detected ($p > 0.05$). Furthermore, the independence of errors was evaluated using Pearson Chi-Square and Deviance Chi-Square values, which were found to be within acceptable ranges. The modeling technique employed in the analysis was the *enter method*, where all independent variables were included simultaneously in the model. In the initial step of logistic regression analysis, the baseline model was evaluated.

This model, also referred to as the null model, includes only the constant term. The Wald statistic calculated for the baseline model ($Wald = 60.280, p = 0.000$) was found to be significant ($p < 0.05$). This result indicates that categorizing the university students who participated in the survey into groups is statistically meaningful. An examination of the score values for variables not included in the baseline model revealed that most of these variables were statistically significant ($p < 0.05$). Additionally, the overall statistic for testing the model's significance (Overall Statistics $= 129.472, p < 0.05$) was significant, further supporting the validity of the model. When analyzing the iteration history results for the constructed logit model, it was observed that the −2Log-Likelihood values were lower compared to those of the baseline model. This reduction indicates an improvement in the model's fit to the data. The initial evaluation of the logit model's fit was performed using the Omnibus test. The test results showed that the chi-square values calculated at the step ($\chi2 = 144.795$), block ($\chi2 = 144.795$), and model ($\chi2 = 144.795$) levels were statistically significant ($p < 0.05$), confirming the overall adequacy of the model.

Table 2. Factors affecting milk consumption among university students

Variables		Frequency	%
Milk Consumption	Yes	85	27.2
	No	228	72.8
Milk Drinking Habit	During Childhood	195	62.3
	During School Years	29	9.3
	No Habit	89	28.4
Daily Average Milk Consumption	One Glass	169	54.0
	Two Glasses	35	11.2
	Do Not Consume	109	34.8
Preferred Milk Animal	Cow	255	81.5
	Sheep	13	4.2
	Goat	16	5.1
	None	29	9.3
Thermal Process Application	Boiling	127	40.6
	Heating	85	27.2
	No Heating	101	32.3
Milk Preference	Pasteurized Milk	179	57.2
	UHT Milk	79	25.2
	Street Milk	55	17.6
Opinion on Milk Price	Expensive	139	44.4
	Cheap	28	8.9
	Normal	146	46.6
Factors Affecting Milk Purchase	Brand	54	17.3
	Price	28	8.9
	Expiration Date	89	28.4
	All Factors	142	45.4
Preferred Milk Fat Content	Full-Fat	59	18.8
	Half-Fat	181	57.8
	Indifferent	73	23.3
Knowledge of Nutritional Value of Milk	Yes	177	56.5
	No	136	43.5
Preferred Products Other Than Milk	Cheese	45	14.4
	Yogurt	84	26.8
	Ayran	96	30.7
	All Dairy Products	88	28.1
Tools Affecting Milk Consumption Preference	Seminar-Meeting	5	1.6
	Habit	252	80.5
	Social Media	35	11.2
	Advertisements	21	6.7
Opinions on Milk Consumption Promotion	Yes	30	9.6
	No	141	45.0
	No Opinion	142	45.4

Table 3. Model fit

Step	-2Loglikelihood	Cox&Snell R^2	Nagelkerke R^2
1	221.296	0.370	0.537

The Nagelkerke R^2 and Cox & Snell R^2 coefficients of determination for the model fit are presented in Table 3. According to the results in Table 3, the −2Log-Likelihood value was calculated as 221.296, the Cox & Snell R^2 value as 0.370, and the Nagelkerke R^2 value as 0.537. Since the Cox & Snell R^2 and Nagelkerke R^2 statistics exceed 0.20, the model is considered statistically meaningful (Alpar, 2011). Another method used to evaluate model fit is the Hosmer-Lemeshow test. This test creates groups based on percentiles of the predicted probabilities from the logit model, and the Hosmer-Lemeshow statistic is calculated by comparing the observed and expected frequencies within these groups. A non-significant result for the Hosmer-Lemeshow test indicates no significant difference between the observed and expected frequencies, suggesting that the model fits the data well (Alpar, 2011). In the multiple logistic regression model used in this study, the Hosmer-Lemeshow test yielded a Chi-Square value of 12.493 ($p = 0.131$), which was not statistically significant ($p > 0.05$). This result indicates consistency between the observed and expected frequencies, demonstrating that the model exhibits a good fit to the data.

Table 4. Multiple logistic regression analysis results

Variables	$\hat{\beta}_j$	$S(\hat{\beta}_j)$	Wald	p	Exp (β)	95% C.I. for Exp (β)	
						Lower	Upper
Faculty	-0.134	0.073	3.349	0.067	0.874	0.757	1.01
Class	-0.752	0.23	10.67	0.001	0.472	0.3	0.74
Age	0.331	0.154	4.639	0.031	1.392	1.03	1.882
Gender	-0.412	0.376	1.198	0.274	0.662	0.317	1.385
Living Place	-0.483	0.296	2.665	0.103	0.617	0.345	1.102
Income	0.349	0.204	2.933	0.087	1.417	0.951	2.113
Milk Drinking Habit	-1.015	0.21	23.241	<0.000	0.363	0.24	0.548
Daily Average Milk Consumption	-1.056	0.209	25.625	<0.000	0.348	0.231	0.524
Preferred Milk Animal	-0.526	0.186	7.972	0.005	0.591	0.41	0.851
Thermal Process Application	-0.157	0.22	0.507	0.476	0.855	0.555	1.316
Milk Preference	0.369	0.256	2.081	0.149	1.447	0.876	2.389
Opinion on Milk Price	0.121	0.194	0.387	0.534	1.128	0.771	1.65
Factors Affecting Milk Purchase	-0.424	0.168	6.359	0.012	0.654	0.471	0.91
Preferred Milk Fat Content	-0.407	0.268	2.309	0.129	0.666	0.394	1.125
Knowledge of Nutritional Value of Milk	-1.172	0.392	8.924	0.003	0.31	0.144	0.668
Preferred Products Other Than Milk	0.04	0.194	0.043	0.835	1.041	0.712	1.524
Factors Affecting Milk Consumption Preference	0.24	0.289	0.691	0.406	1.271	0.722	2.238
Opinions on Milk Consumption Promotion	-0.041	0.282	0.021	0.884	0.96	0.552	1.668
Constant	4.819	3.257	2.189	0.139	123.822		

Method: Enter (likelihood ratio), dependent variable: consumption milk (0 = No; 1 = Yes); Null model (-2Log-Likelihood): 366.091; Full model (-2 Log-Like- lihood): 221.296; Chi squared: 144.795 (p<0.001); R^2 (Cox and Snell) = 0.370; R^2 (Nagelkerke) = 0.537; Hosmer–Lemeshow test: Chi squared = 12.493, df = 8, Sign. 0.131 (n.s); Classification (model): 86.30%; N = 313.

Table 4 presents the results of the logistic regression analysis examining the factors affecting the likelihood of milk consumption among university students. The table includes the maximum likelihood estimates of the β coefficients ($\hat{\beta}_j$) and their associated standard errors, Wald statistics and significance values used to assess the importance of the variables in the model, odds ratios (ORs), and confidence intervals for the ORs. In the analysis, the dependent variable was defined as milk consumers (1) and non-consumers (0). The numerical values summarized in Table 4 provide a detailed overview of the contributions of the independent variables to the model and their respective levels of statistical significance.

The full model ($-2Log-Likelihood = 221.296$) demonstrated a significant improvement compared to the null model ($\chi 2 = 144.795;\ p < 0.001$). The explanatory power of the model, as indicated by Cox and Snell R^2 =0.370 and Nagelkerke R^2 =0.537, suggests that the independent variables account for 37% to 53.7% of the variance in the dependent variable. The Hosmer-Lemeshow goodness-of-fit test ($\chi 2 = 12.493;\ p = 0.131$) indicated that the model fits the data well. Furthermore, the model correctly classified participants' milk consumption status with an accuracy of 86.3%. The class of students had a significant effect on their likelihood of milk consumption ($Wald = 10.67, p = 0.001$). Students in higher class were less likely to consume milk compared to those in lower academic years ($Exp(\beta) = 0.472$). This result indicates that the likelihood of milk consumption among upper-year students decreases by approximately 52.8%. Age was found to have a significant and positive effect on milk consumption ($Exp(\beta) = 1.392$). Among the variables analyzed, "habit of drinking milk" ($Wald = 23.241, p = 0.000$) and "daily milk consumption amount" ($Wald = 25.625, p = 0.000$) made the most substantial contributions to the model. The results indicate that the habit of drinking milk is a strong determinant of milk consumption. Students without a habit of drinking milk were 63.7% less likely to consume milk compared to those with such a habit ($Exp(\beta) = 0.363$). As shown in Table 4, the coefficient for the "habit of drinking milk" variable was calculated as $\hat{\beta}_j = -1.015$, with a negative sign, indicating that individuals without this habit are significantly less likely to consume milk ($Exp(\beta) = 0.363, CI = [0.240,0.548]$). The variable "daily milk consumption amount" was also identified as another strong determinant of milk consumption ($\beta = -1.056, p < 0.001$). According to the Wald statistic, daily milk consumption amount is a significant factor affecting milk consumption behavior. Students who consume lower amounts of milk daily are less likely to consume milk overall ($Exp(\beta) = 0.348;\ 95\%CI = [0.231,0.524]$). The results for "preference for milk type" ($Wald = 7.972, p = 0.005$) showed that it significantly affects milk consumption ($\beta = -0.526, p = 0.005$). Students who prefer alternative milk types, such as sheep or goat milk, were less likely to consume milk compared to those who prefer cow's milk ($Exp(\beta) = 0.591;\ 95\%CI = [0.41,0.851]$). Awareness of the nutritional value of milk significantly affected milk consumption behavior ($\beta = -1.172, p = 0.003$). Students who lacked knowledge about the nutritional value of milk were less likely to consume it ($Exp(\beta) = 0.31;\ 95\%CI = [0.144,0.668]$).

The Wald statistic ($Wald = 8.924, p = 0.003$) confirmed that knowledge of milk's nutritional value is a significant determinant of milk consumption. Finally, factors considered when purchasing milk, such as brand, price, and expiration date, significantly affected milk consumption behavior ($\beta = -0.424, p = 0.012$). Students who paid attention to brand and expiration date were more likely to consume milk ($Exp(\beta) = 0.654;\ 95\%CI = [0.471,0.91]$). The logistic regression results indicate that the variables representing gender ($p = 0.274$), place of residence ($p = 0.103$), heat treatment application preferences ($p = 0.476$), milk preferences ($p = 0.149$),

price perception ($p = 0.534$), milk fat content preference ($p = 0.129$), preference for dairy products other than drinking milk (e.g., cheese, yogurt, or ayran) ($p = 0.835$), factors affecting milk purchasing decisions ($p = 0.406$), and participants' opinions on initiatives to promote milk consumption ($p = 0.884$) did not exhibit statistically significant effects on university students' milk consumption behavior ($p > 0.05$).

Discussion

A review of the literature reveals that although numerous studies have examined university students' milk consumption habits across various institutions, most have employed basic statistical methods rather than multivariate techniques such as logistic regression analysis, which is adopted in the present study. These prior findings largely align with the results obtained herein. Furthermore, existing research consistently emphasizes that the transition from adolescence to adulthood brings about notable changes in students' dietary behaviors. As also observed in the findings of our study, the shift from a family-based environment to an independent lifestyle significantly influences milk consumption patterns, shaped by economic constraints, nutritional awareness, and the need to adapt to new living arrangements. Koyuncu et al. (2014) analyzed the factors influencing the likelihood of organic milk consumption among university students using logistic regression analysis and identified trust, income level, and environmental awareness as significant determinants of consumption behavior. In the present study, which exhibits similarities in terms of sample size and the application of logistic regression analysis, the findings regarding the influence of financial considerations and personal preferences on students' dairy product consumption choices are consistent with mentioned study's observations that price perception negatively affects organic milk consumption. Another study employing logistic regression analysis to examine milk consumption preferences was conducted by Karakaya and Özkan (2020). Similar to the results of our study, their research demonstrated that demographic and economic factors play a crucial role in determining milk consumption preferences. Additionally, their study shares structural similarities with our research in terms of sampling method and sample size. However, unlike our study, which investigates overall milk consumption habits by analyzing the impact of price perception, brand preference, and awareness of product attributes on consumer behavior, Karakaya and Özkan (2020) focused specifically on private-label dairy products. Savran et al. (2011) examined the goat milk and dairy product consumption habits of urban families in Türkiye, analyzing the demographic and economic factors influencing consumption through logistic regression analysis. Unlike our study, which focuses on general milk consumption habits, their research specifically addressed the consumption dynamics of goat milk and its derivatives. However, similar to our study, logistic regression analysis was successfully applied, and the results stated that milk consumption is shaped by individuals' general dietary habits, socioeconomic status, and product perceptions. Güney and Göncü (2024) examined milk consumption habits among Animal Science students, finding that while 85.05% consumed milk, frequency varied, with only 16.48% drinking it daily. Similarly, our study highlights the impact of demographics on consumption behavior. As align with our results, indicating that socioeconomic and informational factors, beyond individual preferences, shape dairy consumption among university students. Çalık et al. (2024) identified yogurt as the most consumed dairy product, whereas our study focused more on milk consumption patterns and influencing factors. Both studies observed a preference for semi-skimmed milk among students and noted economic concerns affecting consumption. Aydın et al. (2023) investigated the impact of the COVID-19 pandemic on students' consumption of animal products, highlighting significant dietary shifts due to economic factors and lifestyle changes. While their study observed a decline in milk and dairy consumption post-pandemic, our study examines particularly demographic and economic influences. Ricklefs-Johnson and Pikosky (2023) highlighted the declining trend in milk consumption and the potential of flavored milk to encourage higher dairy intake among children and adolescents. In contrast, our study focuses on university students and the demographic and economic factors influencing their dairy consumption habits. Connors and Schuelke (2022) found that while students associate date labels with freshness, uncertainty remains regarding actual food safety in assessing milk quality. Similarly, our study highlights the importance of consumer awareness in milk purchasing decisions, as factors such as brand, price, and expiration date influence student preferences. Du et al. (2022) examined the psychological impacts of dairy intake, whereas our study explores demographic and economic factors influencing milk consumption habits. Both studies emphasize the importance of dairy in student well-being, though from different perspectives. Sousa et al. (2022) investigated the relationship between dairy consumption and anxiety levels among university students, finding that higher consumption of fermented dairy products, such as yogurt and cheese, was associated with lower anxiety scores. While their study focuses on the psychological effects of dairy intake, our research examines broader demographic and economic factors influencing milk consumption. Aydın and Ayvazoğlu Demir (2022) analyzed changes in animal food consumption among university students during the COVID-19 pandemic, emphasizing the role of income levels in shaping dietary habits. Aligning with our study, their findings underscore the significant influence of economic factors on dairy consumption among university students. Çetinkaya (2010) investigated the milk and dairy product consumption habits of students at Kafkas University, reporting that the majority of students do not regularly consume milk but instead prefer alternative dairy products such as cheese and yogurt. In alignment with mentioned results, our study also examines university students' milk consumption habits; however, it further elaborates on the underlying demographic, economic, and perceptual factors influencing these behaviors. The milk and dairy product consumption habits of undergraduate students at Yüzüncü Yıl University were explored by Selçuk et al. (2003). Similarly, in our study, the most commonly consumed dairy products apart from milk were identified, with ayran (30.7%) and yogurt (26.8%) ranking

highest. The results of our study are consistent with those of Selçuk et al. (2003), as both studies indicate students' preference for dairy products over milk. However, unlike their research, our study not only examines consumption habits at the product level but also considers the economic and perceptual factors shaping consumption decisions, incorporating variables such as price perception and brand preference into the analysis. Another study conducted with students at Yüzüncü Yıl University by Tarakçı et al. (2003) specifically focused on drinking milk consumption habits. Unlike our study, their research included an assessment of students' knowledge regarding the nutritional value of milk. Ürkek and Taş (2021) evaluated the fermented dairy product consumption habits of students at Gümüşhane University, with their findings aligning with the present study in terms of preferred dairy products. Similarly, Şahinöz and Özdemir (2017) examined the milk and dairy product consumption habits of students at the same university, along with the factors influencing these behaviors. Compared to our study, their research utilized a smaller sample size and identified family habits as the most significant factor in increasing milk consumption, which distinguishes their findings from those of the current study. A study conducted by Derin and Emdirme (2012) at Selçuk University assessed the milk and fermented dairy product consumption habits of students, providing a detailed analysis of demographic variables, similar to our study. Their results also indicate that cheese, yogurt, and ayran are among the most preferred dairy products among students. At Hitit University, Özbey (2020) investigated students' milk and dairy product consumption habits. Unlike our study, their findings suggest that a significant proportion of students continue to consume milk due to habits acquired from their families. Para et al. (2020) analyzed the milk and dairy product consumption habits of students at Erciyes University, incorporating variables such as meal frequency and meal-skipping behaviors, which differentiates their study from our research. Additionally, their study was conducted with a smaller sample size. Similarly, Şimşek and Açıkgöz (2011) evaluated the milk consumption habits of students at Süleyman Demirel University. Their research, conducted with a significantly larger sample, differs from our study in that it provides a more detailed examination of students' dairy product preferences.

Conclusion

As a result, it was found that demographic characteristics, habits, knowledge levels, and preferences play a determining role in milk consumption. Logistic regression analysis revealed that the variables "habit of drinking milk" and "daily milk consumption amount" strongly influence milk consumption behavior. These results suggest that acquiring milk-drinking habits at an early age increases the likelihood of milk consumption later in life, highlighting the importance of early awareness programs. The study observed that knowledge levels, particularly regarding the nutritional value and calcium content of milk, are significant determinants of consumption behavior. Individuals aware of the positive health effects of milk were more likely to consume it. The results support the conclusion that informational campaigns and educational programs could be effective in increasing milk consumption. Additionally, the logistic regression analysis found that factors such as gender, place of residence, perceived price of milk, and milk fat content were not statistically significant in affecting students' milk consumption **(**$p>0.05$). This indicates that milk consumption behaviors are shaped more by individual habits and knowledge awareness than by these external factors. Based on the results, fostering milk-drinking habits, raising awareness about the nutritional value of milk, and implementing initiatives to promote consumption could positively impact milk consumption rates among university students. Such initiatives are likely to be more effective if designed for younger age groups, as supported by the logistic regression analysis. Future research could benefit from comparing milk consumption habits across different socio-economic groups and conducting similar analyses on larger samples to achieve more comprehensive insights. This study is expected to serve as a valuable resource for researchers in the field, contributing to a deeper understanding of milk consumption behaviors from diverse perspectives.

Declarations

Ethical Approval Certificate

The Ethics Committee approval was obtained from the Social and Humanities Scientific Research and Publication Ethics Committee of Kırşehir Ahi Evran University (Date: 08.01.2025, No: 2025/01/06).

Author Contribution Statement

Concept – A.A., M.S.; Design – A.A., M.S.; Supervision – A.A.; Resources – A.A.; Data Collection and/or Processing – M.S., M.Y.; Analysis and/or Interpretation – A.A.; Literature Search – A.A.; Writing Manuscript – A.A., M.S.; Critical Review – A.A., M.S.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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