

Students' Milk Consumption Patterns at Erzincan Binali Yıldırım University

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ABSTRACT: The present study was conducted on 380 students studying at Erzincan Binali Yıldırım University, 57.40% of whom are male and 42.60% female related to their consumption behavior of drinking milk. For analysis of the data, complementary statistics and chi-square test were used. The results of the survey suggest that 21.10% of the students regularly consume milk while 78.90% of the students irregularly drink milk. Among the reasons why the students dislike drinking milk are its taste (37.67%) with a high percentage and smell (30.66%) affecting the students? The percentage of those who do not drink milk for allergic reasons is 4.67%. A significant difference was also reported between the reasons for dislike drinking milk and gender ($p<0.05$). It was found that 27.89 % of the respondents paid attention to the expiry date during shopping and 39.21 % preferred one percent milk. 67.37% of the students reported that they preferred markets for buying milk. It was found that gender, nourishing property, fat level, price and milk consumption patterns in the market played role in the participants' preference of milk consumption.

Keywords: Milk, Chi-Square Test, Consumption Habits, Erzincan.

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INTRODUCTION

Milk has an important place for bone development in terms of nutrients it contains in all periods from infancy to old age. It is an important source for many nutrients including protein, calcium, phosphorus, vitamin B2 and vitamin B12. In this respect, it is a miraculous food that all age groups, especially children, young people and adults, should consume.

Milk consumption is considered as an indicator of country development. Consumption values of milk and dairy products are quite high in countries that are adequately fed and healthy. The most efficient form of milk is to use it as drinking milk (Cetinkaya, 2010).

Turkey is the world's 10th largest producer with an annual production of 22 million tons of milk. Total milk production, which was 15.10 million tons in 2011, increased to 20.12 million tons in 2018 (Anonymous, 2019a). The National Milk Council Report published every two years by FAO on the global food market includes trade data on the basis of the amount of raw milk produced and products produced worldwide. Accordingly, FAO estimates that world total milk production in 2018 is 829 million tons. While the region with the largest shareholder in the increase in the world's total milk production is Asia with an additional 9.7 million tons of milk production compared to previous year, the highest increase in the production of milk in terms of country have been reported to be India, China, Turkey and Pakistan in the report. When the amount of raw milk production and the population data for the same year published annually by Turkish Statistical Institution (TSI) were handled, ignoring the milk and milk products import and export figures, the milk consumption per person was found to be 270 kg of milk. Income growth, urbanization and increased demand as a result of that fact that individuals make more conscious choices about nutrition has led to the increase in the amount of milk and milk products produced in modern facilities. Considering the milk quantity except registered milk production quantity, foreign trade data and the amount of milk collected by the integrated milk companies, consumption of milk per person is estimated to be about 41.50 kg a year (Anonymous 2019b). Although Turkey has an important place in the world, it is way back in terms of milk consumption.

University life, in which students satisfy their nutritional needs, forms the basis of one's future diet. Generally, not having breakfast or lunch and fast food consumption are the common eating behaviors seen among university students, which causes nutritional disorders in students. It is very important to determine the consumption behaviors of milk and dairy products which are very important for adequate and balanced nutrition of university students and to take necessary precautions.

It is necessary to reveal the consumption habits of people and determine the effect of income levels on consumption amounts in order to establish a healthy society. (Tarakçı et al., 2003).

In Turkey, it has been reported in several studies that milk is not sufficiently consumed. At the universities in the cities like Kars (Cetinkaya, 2010), Isparta (Simsek and Acikgoz, 2011), Edirne (Onurlubas et al., 2015), Gumushane (Sahinoz and Ozdemir, 2017), Bitlis (Yalcin and Argun, 2017) and Kayseri (Para et al., 2018), surveys have been conducted to reveal that university students' consumption of milk and dairy products is not at an expected level. To determine the factors that affect the consumption of milk and dairy products, surveys have been administered in the provinces like Istanbul (Simsek et al., 2005), Elazığ (Seker et al., 2012), Ordu (Tarakci et al., 2015), Southern Marmara Region (Niyaz and İnan, 2016), Istanbul, Ankara, Izmir (Onurlubas and Cakırlar, 2016).

This study was conducted on the students' milk consumption behaviors vis-à-vis gender studying at Erzincan Binali Yıldırım University in 2018-2019 academic year in order to the fill the gap in the literature.

MATERIAL AND METHODS

The material of this study is composed of the data obtained from face-to-face interviews with the students selected by sampling method studying at Erzincan Binali Yildirim University in 2019 in order to determine their knowledge and milk consumption habits. The surveys were conducted on the students studying at different schools of Erzincan Binali Yildirim University (Education, Arts and Science, Economics and Administrative Sciences, Theology, Engineering, Pharmacy, Medicine, Law, Dentistry, Vocational Schools and Colleges (Table 1). To determine the appropriate sample, 20 students were given questionnaires beforehand. Sample size was found based on this pilot survey.

Table 1. The number of students at Erzincan Binali Yildirim University

School and college	Number	%
School of education	3 334	15.61
School of arts and science	1 558	7.29
School of economics and administrative sciences	2 159	10.11
School of theology	721	3.38
School of engineering	1 238	5.80
School of pharmacy	253	1.18
School of medicine	373	1.75
School of law	1 521	7.12
School of dentistry	63	0.29
Vocational schools	8 184	38.31
Colleges	1 956	9.16
Total	21 360	100.00

In this study, sample size was determined by non-clustered single-stage random probability sampling method based on the main mass ratios (Collins, 1986; Karakaya and Akbay, 2013).

$$n = t^2 * [1+(0.02) (b-1)] * (p * q) / (e)^2$$

Here; n is for sample size; t: 95% table value depending on the level of importance; b: sample stage (as it is single stage, it is taken as 1); p: probability of realization of the case examined among the main mass (the ratio of those consuming milk regularly); q: the probability of non-realization of the case examined (1-p), (the ratio of those not consuming milk regularly); e: Accepted margin of error (in this study margin of error is taken as 5%). In the equation, if b=1, the equation becomes as follows:

$$n = t^2 * (p*q) / (e)^2$$

By means of the pilot survey conducted before, it was found that 30% of the students regularly drank milk while 70% did drink milk irregularly. This percentage gave us the maximum sample size considering the margin of error. In the study 5% was accepted as the margin of error. Accordingly, the sample size was found by means of the following calculation. $n = (1.96)^2 * (0.30) * (0.70) / (0.05)^2 = 322$ students.

Sample size was determined as 322. Considering that there will be lost values in the survey, the number of surveys has been completed to 380 to represent female and male students.

These 380 students were randomly selected out of the students studying at various schools of Erzincan Binali Yildirim University. The data obtained from the study were examined under two groups as male and female students. The data collected by means of the surveys responded by the students were evaluated by using the chi-square statistical tests of SPSS 22.00 statistical package program.

RESULTS AND DISCUSSION

Socio-Economic Situation of the Students

162 female and 218 male students, totally 380 (Table 2) participated in the surveys, of whom 145 study at vocational school (38.16%), 55 at the school of education (14.47%), 26 at the school of Arts

and Science (6.84%), 46 at the school of engineering (12.11%), 25 at Law (6.58%), 36 at Economics and Administrative Sciences (9.47%), 12 at the Theology (3.16%), 11 at the Schools related to Health Sciences (Medicine, Pharmacy and Dentistry) (2.89%) and 24 at the College (6.32%) (Table 3).

Table 2. Number of students' vs gender

The number of respondents		
	Number	%
Male	218	57.40
Female	162	42.60
Total	380	100.00

Table 3. The number of surveys vs schools

School and college	Number	%
School of education	55	14.47
School of arts and science	26	6.84
School of engineering	46	12.11
School of law	25	6.58
School of economics and administrative sciences	36	9.47
School of theology	12	3.16
Health sciences (medicine, pharmacy, dentistry)	11	2.89
College	24	6.32
Vocational school	145	38.16
Total	380	100.00

26.84% of the students stay with their parents; 54.21% at university housing, 18.16% on their own, 1.05% with relatives (Table 4).

Fathers' jobs of the respondents were found as follows: 24.47% civil servant, 21.05% retired, 20.00% worker, 18.16% artisan, 11.31% farmer and 5% unemployed (Table 4).

In addition, monthly income of 58.68% of the student parents having a direct effect on consumption is more than 3 000 ₺ while that of 13.69% is less than 1 500 ₺ (Table 4).

Monthly average revenue of 44.74% of the students is less than 500 ₺ and that of 16.31% of the students is more than 1 000 ₺ (Table 4).

Students' Consumption of Dairy Products

78.90% of the students answered "No" to the question "Do you have the habit of drinking milk regularly every day?", 21.10% answered "Yes". 25.30% of 21.10% of those stating regular consumption of milk is female and 17.89% is male. Statistically significant difference was observed between male and female students in terms of regular consumption of milk ($p < 0.05$) (Table 5).

In this study, it was seen that students consume 4.69 lt of milk a month and female students consume 3.93 lt/month and male students 5.25 lt/month. In terms of milk consumption habits, although female students consume milk more regularly, it was observed that the amount of milk consumed is less than that of the male students. In a study conducted by Yalcinkaya (1999) on the drinking milk habits and the factors that have an impact on them in the province of Tekirdag, families were reported to consume less than a kilo of milk daily. In the study by Simsek et al. (2005) in Istanbul, milk consumption per capita was reported to be 34lt/year. In the research conducted by Tarakci et al. (2003) to reveal socio-economic situation of the students, their drinking milk habits and knowledge on nutritional benefits of milk, bachelor's degree students at Yuzuncu Yil University were reported to consume milk in average 3.7 lt/month. In a study by Carol et al. (2015), per capita milk consumption in Canada was reported to be 213 mL per day.

The researches on milk consumption habits of people in Turkey reveal that milk is not sufficiently consumed. The present study confirmed that students' milk consumption level is lower than expected.

Table 4. Socio-economic situation of the students

Places where students stay		
	Number	%
University housing	206	54.21
With parents	101	26.58
Student house	69	18.16
With relative	4	1.05
Job of the householder		
Civil servant	93	24.47
Retired	80	21.05
Worker	76	20.00
Artisan	69	18.16
Farmer	43	11.31
Unemployed	19	5.00
Monthly income of the householder (₺)		
Less than 1500	52	13.69
Between 1500-3000	105	27.63
More than 3000	223	58.68
Monthly revenue of the students (₺)		
Less than 500	170	44.74
Between 500-1000	148	38.95
More than 1000	62	16.31
Total	380	100.00

Table 5. Students regular consumption of milk

	Gender					
	Female		Male		Total	
Milk regularly	Number	%	Number	%	Number	%
Consumed	41	25.30	39	17.89	80	21.10
Not consumed	121	74.70	179	82.11	300	78.90
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 3.078, sd = 1, p < 0.05 (0.042)$$

When the reasons for drinking milk were asked to those who regularly consumed milk, it was found that 61.25% of the students consumed milk for the nutritional reasons, 25.00% as a habit, 3.75% because of medical disorder. On the other hand, 10.00% stated that they did not consume milk because they did not have any habit and no specific reason was reported. In the chi-square analysis, it was found that there was a statistically significant difference between the genders in terms of regular milk consumption ($p < 0.05$) (Table 6).

In the study conducted by Cetinkaya (2010) on the determination of milk and dairy product consumption of students at Kafkas University, 46.00% of the students stated that they consumed milk for nutritional reasons while 25.30% drew attention to the need of vitamin, calcium and protein milk provided.

When those not consuming milk regularly were asked the reason, 37.67% stated because of its taste, 30.66% for its smell, 4.67% for the discomfort it causes and 27.00% just because they were not

used to drinking milk. Statistical difference was found between the reasons for drinking and not drinking milk and gender ($p < 0.05$) (Table 6).

Table 6. Regular drinking milk of the students

Reason for drinking milk	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Nutritional	21	51.22	28	71.80	49	61.25
Habit	12	29.27	8	20.51	20	25.00
Discomfort	3	7.32	0	0.00	3	3.75
Other	5	12.19	3	7.69	8	10.00
Total	41	100.00	39	100.00	80	100.00
$X^2 = 17.448, sd = 4, p < 0.05 (0.002)$						
Reasons for not drinking milk						
Smell	39	32.23	53	29.61	92	30.66
Taste	43	35.54	70	39.11	113	37.67
Allergy	14	11.57	0	0.00	14	4.67
Other	25	20.66	56	31.28	81	27.00
Total	121	100.00	179	100.00	300	100.00
$X^2 = 19.945, sd = 4, p < 0.05 (0.001)$						

The students answered the question related to the nutritional benefits of milk as it is protein source with 26.58%, gaining immunity with 15.52%, vitamin and mineral source with 8.68%, source of energy with 3.68%, containing of all nutrients needed 36.58% and none with 2.11%. No statistically significant difference was found between male and female students in terms of milk nutrition ($p > 0.05$) (Table 7).

Table 7. Knowledge level of students on nutritional value of milk

What do you know about nutritional value of milk?	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Protein	44	27.16	57	26.15	101	26.58
Fat	9	5.56	12	5.50	21	5.53
Lactose	2	1.23	3	1.38	5	1.32
Vitamin	14	8.64	19	8.72	33	8.68
Gives energy	6	3.70	8	3.67	14	3.68
Consolidates immunity	27	16.67	32	14.68	59	15.52
All	56	34.57	83	38.07	139	36.58
None	4	2.47	4	1.83	8	2.11
Total	162	100.00	218	100.00	380	100.00
$X^2 = 1.323, sd = 8, p > 0.05 (0.995)$						

Based on the answers given to the question in order to learn the consumption pattern of drinking milk, it was determined that 30.26% of the respondents preferred it cold, 24.21% hot, 12.37% with cacao, 8.68% with sugar, 6.58% in coffee, and 6.05% unsweetened. It is seen that male and female students consume milk more frequently. Statistically significant difference was found between male and female students' consumption patterns of milk. ($p < 0.05$) (Table 8).

Ayar and Demirulus (2000) in their study determined that rural students preferred to drink milk as hot and sweet, while urban students preferred milk cold. In a similar study by Kim et al. (1994) found that 59.5% of those who consumed whole milk prefer flavored whole milk.

Table 8. Milk consumption patterns of students.

How you like milk	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Hot	30	18.52	62	28.44	92	24.21
Cold	44	27.16	71	32.57	115	30.26
With sugar	16	9.88	17	7.80	33	8.68
Without sugar	7	4.32	16	7.34	23	6.05
With cacao	29	17.90	18	8.26	47	12.37
Coffee	14	8.64	11	5.05	25	6.58
Other	5	3.09	9	4.13	14	3.69
No consumption at all	17	10.49	14	6.42	31	8.16
Total	162	100.00	218	100.00	380	100.00

$X^2 = 17.517, sd = 7, p < 0.05 (0.014)$

When asked about the preferred fat level in milk, 39.21% of the students preferred one percent milk, 23.42% whole milk, and 19.47% 2 percent and 8.95% skim milk. 45.68% of the students who preferred one percent milk are female and 34.41% are male students. Statistically significant difference was seen between fat level and gender ($p < 0.05$) (Table 9).

Table 9. Students preference of milk according to fat level

Fat level preferred	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Whole	25	15.43	64	29.36	89	23.42
2 percent	31	19.14	43	19.72	74	19.47
1 percent	74	45.68	75	34.41	149	39.21
Skim	14	8.64	20	9.17	34	8.95
No consumption	18	11.11	16	7.34	34	8.95
Total	162	100.00	218	100.00	380	100.00

$X^2 = 12.232, sd = 4, p < 0.05 (0.016)$

28.16% of the students consumed milk in the evening, which was followed by the percentages 26.32% at bedtime and 17.89% in the morning. The percentage of those who consumed milk between meals was 12.11%. Female students consumed milk in the evening (29.63%) more than male students (27.98%). No statistically significant difference was observed between the meals and male and female students' consumption of milk. ($p > 0.05$) (Table 10).

In their study, Şimşek and Açıkgöz (2011) found that 40.10% of the students consumed milk before bedtime, followed by in the evening (25.30%) and between meals (17.70%) and that the rate of those who consumed milk at breakfast was 14.50%. They also detected that female students' consumption of milk (21.00%) was higher than that of male students (12.90%).

Table 10. Periods of drinking milk of students

Period of drinking milk	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Morning	24	14.82	44	20.18	68	17.89
Noon	9	5.56	8	3.67	17	4.47
Evening	48	29.63	59	27.07	107	28.16
Before going to bed	39	24.07	61	27.98	100	26.32
Between meals	21	12.96	25	11.47	46	12.11
No consumption at all	21	12.96	21	9.63	42	11.05
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 4.096, sd = 5, p > 0.05 (0.536)$$

To the question asked to determine where the students got milk, they answered mostly (67.37%) from the market, 12.63% produced themselves, 8.41% from the grocery, 7.63% from the street milkman. 69.75% of the students who bought milk from the market were female students and 65.60% were male students. No statistically significant difference was seen between male and female students in terms of places where they got milk ($p > 0.05$) (Table 11).

Sahin et al. (2001) suggested that markets were the most preferred stores. The rich variety, the diverse products, price comparability, product and service quality, easy return of defective goods were shown as among the most important factors in choosing the market.

Table 11. Distribution of markets students buy milk

Where do you get milk?	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Market	113	69.75	143	65.60	256	67.37
Grocery	11	6.79	21	9.63	32	8.42
Milkman	10	6.17	19	8.71	29	7.63
Self-product	22	13.58	26	11.93	48	12.63
No milk at all	6	3.71	9	4.13	15	3.95
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 2.161, sd = 4, p > 0.05 (0.706)$$

In order to determine the type of milk preferred by the students, 41.05% stated processed milk, 27.37% fruit milk and 18.69% unprocessed milk. While 38.89% of the female students preferred processed milk, this rate was 42.66% for male students. Statistically significant difference was found between the patterns of milk preferred by male and female students ($p < 0.05$) (Table 12).

In the research conducted by Celik et al. (2005) in the province of Sanliurfa, 46.30% of consumers bought unprocessed milk while 53.70% preferred processed milk. In the study conducted by Karakaya and Akbay (2013), it was determined that approximately 26.50% of the families consumed unprocessed milk, 26.20% consumed pasteurized milk and 87.70% consumed sterilized milk. In the study conducted by Akbay and Tiryaki (2013) in Kahramanmaras, 57.00% of consumers preferred unprocessed milk and 38.00% preferred processed milk. In the same study, nearly 50.00% of the participants regarded unprocessed milk as much healthier.

Table 12. Types of milk students prefer

Type of milk consumed weekly	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Processed milk	63	38.89	93	42.66	156	41.05
Milk fruit	56	34.57	48	22.02	104	27.37
Lactose free milk	6	3.70	14	6.42	20	5.26
Unprocessed milk	23	14.20	48	22.02	71	18.69
No consumption	14	8.64	15	6.88	29	7.63
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 10.395, sd = 4, p < 0.05 (0.034)$$

On the other hand, 38.68% of the students stated that milk is expensive. 37.63% of the students think that the price is reasonable. Only 5.00% of the students found that milk was cheap. Statistically significant difference was observed between milk price and gender ($p < 0.05$) (Table 13).

In a similar study by Simsek et al. (2005), it was found that 2.00% of the university students pointed out that milk was cheap, 51.00% stated reasonable and 47.00% expensive.

Table 13. Students' opinions on milk price

Price	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Expensive	36	22.22	111	50.92	147	38.68
Affordable	80	49.38	63	28.90	143	37.63
Cheap	7	4.32	12	5.50	19	5.00
No idea	39	24.08	32	14.68	71	18.69
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 34.795, sd = 3, p < 0.05 (0.000)$$

Table 14 shows the distribution of the features that students take into consideration when buying dairy products. When these values are examined, 26.32% of the students stated that they considered the expiration date of the brand they preferred while 27.89% of them bought dairy products. It is seen that 16.58% of the students bought dairy products by considering hygiene, 13.95% the price, 7.10% the level of fat, 3.16% general appearance of the product.

Selcuk et al. (2003) in a similar study found that 17.62% of university students took the brand into consideration when buying dairy products and 47.80% of the surveyed students paid attention to the expiration date. Studies conducted by Wilkie (1986) and Assael (1992) reported that gender, which is one of the demographic features, plays a decisive role in consumers' preferences for products and brands.

Seeing that seasonal differences might be effective on families' milk consumption, they were asked in which season they consumed most milk. On average, 47.37% of the students stated that they consumed milk in all seasons, 25.53% in the winter, 9.21% in the summer, 3.68% in fall and 2.89% in the spring. Statistically significant difference was observed between the seasons when milk was consumed and gender ($p < 0.05$) (Table 15).

Table 14. Features students pay attention to when buying milk.

Features concerned when buying milk	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Brand	44	27.16	56	25.69	100	26.32
Date of expiry	52	32.10	54	24.77	106	27.89
Price	17	10.49	36	16.51	53	13.95
Diversity	5	3.09	3	1.38	8	2.10
Hygiene	22	13.58	41	18.81	63	16.58
Fat level	13	8.02	14	6.42	27	7.10
Other	5	3.09	7	3.21	12	3.16
No purchase	4	2.47	7	3.21	11	2.90
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 7.621, sd = 7, p > 0.05 (0.367)$$

Table 15. Seasons when students consume milk.

	Gender					
	Female		Male		Total	
	Number	%	Number	%	Number	%
Spring	2	1.22	9	4.13	11	2.89
Summer	11	6.79	24	11.01	35	9.21
Fall	9	5.56	5	2.29	14	3.68
Winter	46	28.40	51	23.40	97	25.53
All seasons	71	43.83	109	50.00	180	47.37
No-consumption	23	14.20	20	9.17	43	11.32
Total	162	100.00	218	100.00	380	100.00

$$X^2 = 10.899, sd = 5, p < 0.05 (0.053)$$

CONCLUSIONS

In the present study, the aim is to determine drinking milk consumption behaviors of students at Erzincan Binali Yildirim University. To achieve this aim, 380 students were surveyed, and Chi-square analyzes were conducted. The results of the analysis suggest that 21.10% of the students studying in different units of Erzincan Binali Yildirim University consume milk regularly while 78.90% do not consume milk regularly. The same is also valid for students with high income. In addition, the majority of students who consume milk regularly prefer processed milk. The results also showed that the majority of the students consumed milk because of its nutritional value. Considering the results, it is argued that activities that are of great importance in balanced and adequate nutrition, which encourage students to drink milk, should be organized.

In order to increase milk consumption, large-scale campaigns should be made throughout the country to provide accessibility to consumers of all age groups. Instead of carbonated beverages, milk should be available in mass consumption areas and its consumption should be encouraged. In order to support the habit of drinking milk, projects should be developed as of childhood. Informative activities should be carried out on the benefits of milk, public spots should be established in the visual media and more conscious consumers should be intermediary.

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