



**DETERMINATION OF OPINIONS ON PLANT AND ANIMAL BASED
NUTRITION OF STUDENTS IN A FOUNDATION UNIVERSITY, AND
EVALUATION OF RESULTS FOR FOOD SUSTAINABILITY**

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ABSTRACT

This study was conducted with 310 students of a university, to determine the approach of new generations to the plant-based diet and/or animal-based diet, and to examine the contribution of this approach to sustainable food. The data were evaluated using descriptive statistics in the computer. In the study, 97.7% of the participants had a mixed diet, 63.5% preferred to consume animal products for a healthy eating pattern. 79.7% stated that animal-based products cause more harm to nature. 66.5% of the participants stated that they could change their diet to protect nature. While it is not possible to transition wholly to plant-based nutrition culturally and geographically, as a result of this research, it can be said that nutrition and environmental education needs to be enriched through state and international organizations in order to achieve sustainability at every stage of the line from production to consumption.

Keywords: Animal based nutrition, plant based nutrition, sustainability, environment.

**BİR VAKIF ÜNİVERSİTESİ ÖĞRENCİLERİNİN BİTKİSEL VE HAYVANSAL
BESLENME İLE İLGİLİ GÖRÜŞLERİNİN BELİRLENMESİ VE SONUÇLARIN
SÜRDÜRÜLEBİLİR GIDA AÇISINDAN DEĞERLENDİRİLMESİ**

ÖZ

Bu çalışma, yeni kuşakların bitkisel ve/veya hayvansal beslenme konusundaki yaklaşımlarını tespit etmek ve bu yaklaşımın sürdürülebilir gıdaya katkısını değerlendirmek için bir üniversitenin 310 öğrencisiyle yapılmıştır. Veriler bilgisayar ortamında tanımlayıcı istatistikler kullanılarak değerlendirilmiştir. Çalışmada, katılımcıların % 97.7'si karışık bir diyetle sahip olduğu, % 63.5'i sağlıklı bir beslenme modeli için hayvansal ürünleri tüketmeyi tercih ettiği belirlenmiştir. %79.7'si hayvansal ürünlerin doğaya daha fazla zarar verdiğini belirtmiştir. % 66.5'i, doğayı korumak için diyetlerini değiştirebileceklerini belirtmiştir. Tamamen bitkisel temelli beslenme, kültürel ve coğrafi olarak mümkün olmamakla birlikte, bu araştırmanın sonucunda, üretimden tüketime her aşamada sürdürülebilirliği sağlamak için, devlet ve uluslararası örgütler aracılığıyla beslenme ve çevre eğitiminin zenginleştirilmesi gerekmektedir denilebilir.

Anahtar kelimeler: Hayvansal beslenme, bitkisel beslenme, sürdürülebilirlik, çevre.

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INTRODUCTION

World population is increasing day by day (Ulaszewska et al., 2017). World population is expected to reach 9 billion from 7 billion from the year 2010 to 2050 (Smith et al., 2013). Along with the increasing population, per capita food consumption is also increasing. From 2000 to 2050 it is predicted that the consumption of meat in the world will be 2 times higher and cereal consumption will increase by 60% (Smith et al., 2013). According to Food and Agriculture Organization (FAO), global food demand is expected to increase by 60% from 2007 to 2050 (Meybeck et al., 2017). However, humankind needs to cope with global challenges that play significant roles on shaping food habits. Problems such as power supply and increases in long term energy prices, climate change, poverty and world hunger, water scarcity, the reduction of biodiversity can be given as examples of global difficulties (Von Koerber et al., 2017). As natural resources are limited and obesity increases with the population, future generations may face the problem of rapid depletion of natural resources (Seves et al., 2017). Moreover, The influence of food, along with sourcing, on both the local and global environment is great (Davis et al., 2010). The production, processing, preservation and distribution of food constitutes 20-60% of environmental impacts such as greenhouse effect, eutrophication and acidification (Hallström et al., 2014). The greenhouse effect caused by human activities has increased by 70% in the last 40 years. The increase in global average temperature, will cause adverse effects, including serious environmental impacts and future food and water availability (Solomon et al., 20017).

The impact of agriculture and food production, along with human activities, on the issues of the use of natural resources and environmental sustainability is rather high (Ulaszewska et al., 2017; Foley et al., 2011). Factors such as greenhouse gases generated during the food production, land use, water pollution have adverse effects on the environment. The adverse effects of food production on the environment is increased by consumers' demands and consumers' eating habits (Ulaszewska et al., 2017). However, differences in agricultural production,

transport distances and transport methods, can change the overall picture of environmental impact for plant and animal-based products per kilograms (Davis et al., 2010). For example, Life Cycle Assessment (LCA) studies indicate that plant based products have less negative impact on environment when compared to animal-based products. Even though the environmental impact of fruits and vegetables is less, the damage to the environment can be made even less by using wheat instead of products like potato as a carbohydrate source. In general, the reason for this is the greenhouse gas produced by fruits and vegetables and the amount of soil they use is much higher than cereals and less than meat and dairy products (Westhoek et al., 2014).

The impact of food on both the local and global environment is major (Davis et al., 2010). Changes in land cover and land use, have increased carbon emissions by 12.5%. This qualifies land use as the second most important source in carbon emissions after burning fossil fuels (Houghthon et al., 2012; Weindl et al., 2017). The livestock sector is an important indicator of human intervention in land use. The total land use in livestock production constitutes 80% of the agricultural area (Weindl et al., 2017). Deforestation is one of the critical points in land use issue. Factors such as establishment of new pastures for animal grazing or expansion of arable land to increase animal feed, such as soy, are greatly responsible for deforestation (Herrero et al., 2009; Naylor et al., 2005). Decreasing animal based calorie intake by 15%, by the year 2050, is expected to decrease the carbon emissions resulting from land use by 78% (Weindl et al., 2017).

The other environmental impact of food production is water use. Water footprint calculation is a tool that calculates water consumption of products. Water footprint measures freshwater consumption and pollution throughout product supply chains (Aldaya et al., 2012). Nowadays, the global water footprint of animal production is almost one third of the water footprint of total agricultural production, and this rate is likely to increase (Hoekstra et al., 2012; Liu et al., 2008). Animal based products have a

particularly larger water requirement compared to plant based products. For example, the total water footprint of pigs is two times larger than the water footprint of legumes, four times larger than the water footprint of grains (Mekonnen et al., 2012).

Climate change is the most alarming problem for our species and our planet. The greenhouse gases in the earth's atmosphere constitute greenhouse gas effect by absorbing infrared radiation which is meant to be radiated into space (Cleveland et al., 2017). Greenhouse gas effect, increases global average temperature and excessive rainfall by altering the radiation balance of the Earth's climate system and increasing the amount of retained heat (Cleveland et al., 2017). If temperatures continue to rise, climate change will cause decrease in food productivity by affecting food production negatively (Meyer et al., 2017). In order to reduce climate change, is a way to reduce meat consumption (De Boer et al., 2013). The concept of Sustainable Diet takes these factors into account and aims reduction of greenhouse gas emissions by influencing consumer behaviors (Cleveland et al., 2017).

The sustainable food system is a food system that provides people with food safety and nutrition on an economic, social and environmental basis, and does not jeopardize the feeding of future generations. Sustainable diet is a diet that contributes to sustainable food systems that contribute to good nutrition and long-term good health for the individual and the community, thereby is a diet that contributes to the long-term food safety and nutrition of food (Meybeck et al., 2017). Although the concept of sustainable food systems is not new, interest in how food and dietary patterns are linked to ecosystems and how natural resources are used in environmental, economic, social and culturally in sustainable ways has recently been increasing (Ulaszewska et al., 2017). The combination of problems of sustainability and nutritional imbalance constituted by population growth and changing climate and environmental conditions that will make food production in the coming years increasingly difficult and unpredictable (Davis et al., 2010). Long-term food safety can only be achieved if we consider the sustainability of our

food supply (Nerlson et al., 2016). Sustainable diets are defined by FAO as “protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources” (Food-based dietary guidelines, 2018). According to Meyer et.al, sustainability is important as to meet the needs and aspirations of the present generation without compromising the ability of the future generations to meet their needs and aspirations (Meyer et al., 2017). Sustainable diets are diets that have low environmental impact and contribute to food and nutritional safety and that are a healthy life for the present and future generations (Nerlson et al., 2016). In this study, it is aimed to determine the approach of new generations to plant-based nutrition and to examine the contribution of this to sustainable food. For this purpose, a research based on the attached informative data form has been conducted on the sample of students of Faculty of Health Sciences at a foundation university.

MATERIAL AND METHOD

The research was conducted at Yeditepe University Faculty of Health Sciences between March 2018 and April 2018. 310 students of Faculty of Health Sciences from Yeditepe University constitute the universe of the study. In the study, the stratified random sampling method was used. The overall sample consists of some members from different departments of the faculty and they were chosen randomly. With this method, members from each group represented in the study. Participants are between the ages of 18-25. Approval of the Ethics Committee of the study was taken from Yeditepe University Hospital on 15.02.2018. Data Form was prepared after searching with related keywords of this research. Science Direct, PubMed databases and the Turkish and international journals were used as sources. That form including information on “Animal and Plant Based Diets” was used to collect the data of the study. The informed Volunteer Consent Form has been read and signed before filling out. A statistical data analysis program called IBM SPSS Statistics 24 is used.

Frequency tables and descriptive statistics were also used in the interpretation of findings. In the analysis of the relations between two qualitative variables, " χ^2 -cross tables" were used according to the expected value levels (Pearson, Yates-continuity correction). Significance in the study was accepted as $p < 0.05$.

RESULTS

The research was conducted on 310 students studying at Yeditepe University Faculty of Health Science. 276 participants (89.0%) were females and 34 participants (11.0%) were males. It was stated in the Table 1. It was determined that, the mean age of the participants was 21.16 ± 1.22 (years).

Table 1. General Distribution of Participants

Variable (n=310)	n	%
Age [$\bar{X} \pm S.S. \rightarrow 21, 16 \pm 1, 22$ (yıl)]		
20 years and below	92	29.7
21-22 years	182	58.7
23 years and over	36	11.6
Department		
Dietetics	116	37.4
Physiotherapy and Rehabilitation	119	38.4
Nursing	75	24.2
Grade		
Freshmen	41	13.2
Sophmores	104	33.5
3rd Graders	164	52.9
Final Year	1	0.3
Gender		
Female	276	89.0
Male	34	11.0
Marital Status		
Married	1	0.3
Single	309	99.7
Place of Residence		
Family	193	44.8
Students house	116	37.4
Dormitory	55	17.8

As seen in Table 2, 303 people (97.7%) who participated in the study had a mixed eating pattern. 197 (63.5%) of the participants responded the question of healthy eating pattern as animal-based. In terms of protein quality, 291 (93.9%) of the participants believed that animal-based products are richest. A statistically significant relationship was found between the healthy eating pattern and the choice of the richest food group in terms of protein quality ($\chi^2 = 5064, P = 0.024$).

As it can be seen in the Table 3, in terms of protein contents; 57 of the participants (18.4%)

said soybeans are the richest plant-based products in protein. 181 participants (61.0%) supported the idea that the foods they consumed were not harmful to nature, and 121 people (39%) supported the idea that the foods they consumed harmed nature. It was determined that 242 participants (79.7%) preferred animal-based products that cause more harm to the environment. 168 participants (55.3%) claimed cattle to be animals with the largest environmental impact of the animal-based products. In terms of protein sources, 177 participants (58.2%) stated animal milk stated eggs to be environmentally

harmful products. It was determined that 206 participants (66.5%) could change the way of feeding for less harm to nature. It was determined

that 128 participants (71.2%) believed that the eating pattern to be preferred for less harm to the nature was plant-based.

Table 2. Distribution of Eating Patterns

Variable (n=310)	n	%
Diet Pattern		
Mixed Feeding	303	97.7
Vegetarian	7	2.3
Vegetarian subclass		
Lakto	2	28.6
Ova	1	14.3
Lakto – Ova	4	57.1
Healthy eating Pattern		
Animal-based	197	63.5
Plant-based	113	36.5
Reason for preferring animal-based products		
Considering as healthy	197	63.5
Like the taste	63	20.3
Not feeling sense of satiety	34	11.0
Family factors	16	5.2
Reason for preferring plant-based products		
Being popular	7	2.3
Weight control	112	36.1
Like the taste	156	50.3
Family habit	35	11.3
Most frequently consumed meat group		
Red meat	118	38.9
Chicken	170	56.1
Fish	15	5.0
Frequency of the most consumed meat products		
Every day	57	18.8
Several times a week	223	73.6
Several times a month	23	7.6
Preference of diary products consumption		
Animal milk	300	96.8
Plant milk	10	3.2
Consumption of meat substitutes like soybean		
Yes	55	17.7
No	255	82.3
Consumption of food items like Legumes, cereals		
Every day	43	13.9
Several times a week	222	71.6
Several times a month	45	14.5
The richest food in protein		
Animal-based	291	93.9
Plant-based	19	6.1
Animal-based food that is richer in protein		
Meat products	206	66.5
Dairy	37	11.9
Egg	67	21.6

Table 3. Distribution of findings related to research

Variable (n=310)	n	%
Plant-based product richer in protein		
Soybeans	57	18.4
Legumes	200	64.5
Bulghur	10	3.2
Kinoa	21	6.8
Chia	22	7.1
Consumed foods' damage to the nature of		
Yes	121	39.0
No	189	61.0
Products that cause more damage to nature		
Animal-based	242	79.3
Plant-based	63	20.7
Environmentally more harmful meat group products		
Cattle	168	55.3
Sheep	31	10.2
Chicken	45	14.8
Fish	60	19.7
Environmentally harmful protein sources		
Cheese	73	24.0
Animal milk	177	58.2
Egg	54	17.8
Environmentally more harmful plant-based product		
Rice		
Bulghur	202	67.3
Legumes	22	7.4
	76	25.3
Change of diet for less harm to nature		
Yes	206	66.5
No	104	33.5
Eating pattern that should be preferred for less harm to the nature		
Animal-based	63	29.2
Only herbal	25	11.5
Plant based	128	59.3

As shown in Table 4, a statistically significant relationship was detected between the healthy eating pattern and the choice of food group that causes more harm to the nature ($\chi^2 = 11286$; $P = 0.001$). It has been found that 142 participants (73.2%), whose choice of healthy eating pattern was animal-based, selected food product that harms the nature more as animal-based products. A statistically significant relationship was found between the healthy eating pattern and environmentally more harmful meat group products. ($\chi^2 = 12757$; $P = 0.005$). It was found

that 95 participants (49.0%) who chose animal-based products as the healthy eating pattern, regard cattle products more harmful. A statistically significant relationship was found between the healthy eating pattern and the selection of the food group to be preferred for less harm to the nature ($\chi^2 = 25490$; $P = 0.000$). It has been determined that 57 participants (29.2%) who chose animal-based products to be preferred for less harm to the nature, chose animal-based diet as the healthy eating pattern.

Table 4. Investigation of some findings related to research

Variable (n=310)	Healthy Eating Pattern			Statistical analysis * Probability
	Animal-based	Plant-based	Total	
The richest in terms of protein quality				
Animal-based	190 (%96.4)	101 (%89.4)	291 (%93.9)	$\chi^2=5.064$ $P=0.024$
Plant-based	7 (%3.6)	12 (%10.6)	19 (%6.1)	
Animal-based products richer in protein				
Meat products	137 (%69.5)	69 (%61.1)	206 (%66.5)	$\chi^2=2.812$ $P=0.245$
Milk	23 (%11.7)	14 (%12.4)	37 (%11.9)	
Egg	37 (%18.8)	30 (%26.5)	67 (%21.6)	
Plant-based products richer in protein				
Soybean	31 (%15.7)	26 (%23.0)	57 (%18.4)	$\chi^2=6.875$ $P=0.143$
Legume	125 (%63.5)	75 (%66.4)	200 (%64.5)	
Bulghur	7 (%3.6)	3 (%2.7)	10 (%3.2)	
Kinoa	17 (%8.6)	4 (%3.5)	21 (%6.8)	
Chia	17 (%8.6)	5 (%4.4)	22 (%7.1)	
The kind of food that gives more harm to the nature				
Animal-based				
Plant-based	142 (%73.2)	100 (%90.1)	242 (%79.3)	$\chi^2=11.286$ $P=0.001$
	52 (%26.8)	11 (%9.9)	63 (%20.7)	
Environmentally more harmful of the meat group products				
Cattle	95 (%49.0)	73 (%66.4)	168 (%55.3)	$\chi^2=12.756$ $P=0.005$
Sheep	25 (%12.9)	6 (%5.4)	31 (%10.2)	
Chicken	36 (%18.6)	9 (%8.2)	45 (%14.8)	
Fish	38 (%19.5)	22 (%20.0)	60 (%19.7)	
More harmful to nature in terms of protein				
Cheese	53 (%27.5)	20 (%18.0)	73 (%24.0)	$\chi^2=5.347$ $P=0.069$
Animal milk	103 (%53.4)	74 (%66.7)	177 (%58.2)	
Egg	37 (%19.1)	17 (%15.3)	54 (%17.8)	
Plant-based product more harmful to the nature				
Rice	127 (%66.5)	75 (%68.8)	202 (%67.3)	$\chi^2=0.271$ $P=0.873$
Bulghur	15 (%7.9)	7 (%6.4)	22 (%7.3)	
Legume	49 (%25.6)	27 (%24.8)	76 (%25.4)	
The product that should be preferred for less harm to the environment				
Animal-based	57 (%29.2)	6 (%5.4)	63 (%20.6)	$\chi^2=25.490$ $P=0.000$
Only Herbal	12 (%6.2)	13 (%11.7)	25 (%8.2)	
Plant based	126 (%64.6)	92 (%82.9)	218 (%71.2)	

As shown in Table 5, there is a statistically significant relationship between the eating pattern that causes more harm to the nature and the environmentally more harmful meat group products ($\chi^2 = 26332$; $P = 0.000$). It was determined that 151 participants (62.7%) who think that cattle products are the meat group products that have the greatest harm to the nature, indicated that the most harmful eating pattern is animal-based diet. There is a statistically

significant relationship between the eating pattern that is more harmful to nature and the eating pattern that should be preferred for less harm to nature ($n = 28760$; $P = 0.000$). The participants who think that the product that should be preferred for less harm to the environment is only herbal, or plant based, at a very high rate state that the most harmful eating pattern to the nature is animal-based diet.

Table 5. Investigation of some findings related to research

Variable (n=310)	Eating Pattern that causes more harm to the nature			Statistical analysis * Probability
	Animal-based	Plant-based	Total	
Environmentally more harmful meat group products				
Cattle	151 (%62.7)	17 (%27.0)	168 (%55.3)	$\chi^2=26.332$ $P=0.000$
Sheep	19 (%7.9)	12 (%19.0)	31 (%10.2)	
Chicken	30 (%12.4)	15 (%23.8)	45 (%14.8)	
Fish	41 (%17.0)	19 (%30.2)	60 (%19.7)	
More harmful to nature in terms of protein sources				
Cheese	54 (%22.5)	19 (%30.2)	73 (%24.1)	$\chi^2=3.579$ $P=0.167$
Animal milk	146 (%60.8)	30 (%47.6)	176 (%58.1)	
Egg	40 (%16.7)	14 (%22.2)	54 (%17.8)	
Plant-based product more harmful to the nature				
Rice	162 (%68.3)	40 (%63.5)	202 (%76.3)	$\chi^2=1.013$ $P=0.603$
Bulghur	18 (%7.6)	4 (%6.3)	22 (%7.3)	
Legume	57 (%24.1)	19 (%30.2)	76 (%25.4)	
The product to prefer for less harm to the nature				
Animal-based	35 (%14.5)	28 (%45.2)	63 (%20.8)	$\chi^2=28.760$ $P=0.000$
Only Herbal	23 (%9.6)	2 (%3.2)	25 (%8.2)	
Plant based	183 (%75.9)	32 (%51.6)	215 (%71.0)	

As it can be seen in Table 6, a statistically significant relationship was found between gender and the type of food that is more harmful to the nature ($\chi^2 = 8699$; $P = 0.003$). It was determined that 223 women (81.7%) and 19 men (59.4%) participating in the survey thought that animal-based products cause more harm to the nature. A statistically significant relationship was detected between gender and environmentally more harmful meat group product ($\chi^2 = 19906$; $P = 0.000$). It was determined that 158 women

(58.1%) participating in the survey think products of cattle meat, and 10 men (31.3%) think products of both cattle and sheep are more harmful to the nature. A statistically significant relationship was found between gender and change of eating pattern status for less harm to nature ($\chi^2 = 13396$; $P = 0.000$). It was determined that 191 women participating in the survey (69.7%) could support this change and 21 men (61.8%) would not.

Table 6. Investigation of some findings related to research

Variable (n=310)	Gender		Total	Statistical analysis * Probability
	Female	Male		
Foods that cause more harm to the nature				
Animal-based	223 (%81.7)	19 (%59.4)	242 (%79.3)	$\chi^2=8.699$
Plant-based	50 (%18.3)	13 (%40.6)	63 (%20.7)	$P=0.003$
Environmentally more harmful meat group product				
Cattle	158 (%58.1)	10 (%31.3)	168 (%55.3)	$\chi^2=19.906$
Sheep	21 (%7.7)	10 (%31.3)	31 (%10.2)	$P=0.000$
Chicken	41 (%15.1)	4 (%12.4)	45 (%14.8)	
Fish	52 (%19.1)	8 (%25.0)	60 (%19.7)	
More harmful to nature in terms of protein sources				
Cheese				
Animal milk	64 (%23.4)	9 (%29.0)	73 (%24.0)	$\chi^2=0.482$
Egg	160 (%58.7)	17 (%54.8)	177 (%58.2)	$P=0.786$
	49 (%17.9)	5 (%16.2)	54 (%17.8)	
Plant-based product more harmful to the nature				
Rice				
Bulghur	184(%68.4)	18 (%58.1)	202 (%67.3)	$\chi^2=1.884$
Legume	20 (%7.4)	2 (%6.4)	22 (%7.3)	$P=0.390$
	65 (%24.2)	11 (%35.5)	76 (%25.4)	
Change of eating pattern for less harm to the nature				
Yes	191 (%69.7)	13 (%38.2)	204 (%66.2)	$\chi^2=13.396$
No	83 (%30.3)	21 (%61.8)	104 (%33.8)	$P=0.000$

As shown in Table 7, there is a statistically significant relationship between the departments and environmentally more harmful nutritions ($\chi^2 = 6648$; $P = 0.036$). It was found that 100 participants (87.0%) who think that animal-based products are more harmful to the nature are in Dietetics Department.

DISCUSSION

Animal-based products contain high levels of protein in high biological value and high amounts of saturated fatty acids, as well as significant amounts of micronutrients. As noted in Schönfeldt et al.'s work, the dietary contribution

of products obtained from animals can be beneficial or harmful (Schönfeldt et al., 2013). In this study, it was stated that 303 of the participants (97.7%) had mixed nutrition style. As a reason for this, western diet can be addressed as it is widespread in our country. The role of meat in healthy diet is not clear. In many healthy nutrition perception, meat consumption is required to be limited. In a study conducted in Canada, participants were reported to try to limit the intake of meat, particularly red meat, to redirect healthy eating by replacing red meat with chicken or fish (Paquette et al., 2005).

Table 7. Investigation of some findings related to research

Variable (n=310)	Department			Total	Statistical analysis * Probability
	Dietetics	Physiotherapy and Rehabilitation	Nursing		
Nutrition that is more harmful to the nature					
Animal-based	100 (%87.0)	85 (%73.9)	57 (%76.0)	242 (%79.3)	$\chi^2=6.648$ $P=0.036$
Plant-based	15 (%13.0)	30 (%26.1)	18 (%24.0)	63 (%20.7)	
Environmentally more harmful meat group product					
Cattle	67 (%58.3)	58 (%50.9)	43 (%57.3)	168 (%55.3)	$\chi^2=11.811$ $P=0.066$
Sheep	5 (%4.3)	20 (%17.5)	6 (%8.0)	31 (%10.2)	
Chicken	19 (%16.5)	14 (%12.3)	12 (%16.0)	45 (%14.8)	
Fish	24 (%20.9)	22 (%19.3)	14 (%18.7)	60 (%19.7)	
Product more harmful to the nature in terms of protein sources					
Cheese	23 (%20.2)	33 (%28.7)	17 (%22.7)	73 (%24.0)	$\chi^2=4.351$ $P=0.361$
Animal milk	74 (%64.9)	61 (%53.0)	42 (%56.0)	177 (%58.2)	
Egg	17 (%14.9)	21 (%18.3)	16 (%21.3)	54 (%17.8)	
Plant-based product more harmful to the nature					
Rice	77 (%67.5)	76 (%68.5)	49 (%65.3)	202 (%67.3)	$\chi^2=1.358$ $P=0.851$
Bulgur	7 (%6.2)	10 (%9.0)	5 (%6.7)	22 (%7.3)	
Legume	30 (%26.3)	25 (%22.5)	21 (%28.0)	76 (%25.4)	
Change of eating pattern for less harm to the nature					
Yes	81 (%70.4)	73 (%61.9)	50 (%66.7)	204 (%66.2)	$\chi^2=1.921$ $P=0.383$
No	34 (%29.6)	45 (%38.1)	25 (%33.3)	104 (%33.8)	

It was determined that dairy product preference of 300 participants (96.8%) was animal milk. As stated by Güler in her study of Culinary Culture and Eating and Drinking Habits the formation of Turkish food culture dates back to the Central Asian Turks. Sheep and dairy products are among the basic nutrients of ancient Turks. Sheep, goat and cattle are used for milk production (Güler, 2010). Preference of animal milk which is an ancestral habit, is related to Turkish eating and drinking taste and culture.

It was determined that 291 of the participants (93.9%) thought that the richest nutritional

product in terms of protein quality was animal-based products, and 206 of them (66.5%) preferred meat products as richer protein sources. In a conference about "excessive and inadequate nutrition: challenges and approaches" it was directly related to the amount of protein intake and protein quality of animal-based products. However, it has been reported that meat products contain all the amino acids such as lysine, isoleucine, valine, threonine; and amino acid scores of animal-based proteins are very high (Millward et al., 2010). According to De Boer, Helms and Aiking, the premier protein source of

Europe is meat (De Boer et al., 2006). Also, Protein digestibility-corrected amino acid score is 0.92 for beef and 1.00 for eggs and milk (Hoffman et al., 2004). According to the Protein digestibility-corrected amino acid score value, black bean is 0.75 while soy is 1.00 (Hoffman et al., 2004). Among the plant-based proteins, soy is the richest in terms of protein quality. In addition, animal metabolism uses an average of 6 kg of plant-based protein to produce 1 kg of meat protein; which means that only 15% of the protein in the feed crops is converted to food for human consumption, and 85% is spent in this process (De Boer et al., 2011).

It was shown in the survey that 189 participants (61.0%) suggested the notion that the products they consume did not harm the nature, 242 participants (79.7%) stated that animal-based products are more harmful to the nature. Recent reports by the Pew Commission for the United Nations and Industrial Livestock Production have shown that livestock cause more global warming, by 40%, than all transport combined (Rothgerber et al., 2013). The United Nations report has described the livestock industry as one of the most important causes of various environmental problems such as biodiversity loss, water shortage and pollution (Rothgerber et al., 2013). Ulaszewska et al. reported in their study that factors such as greenhouse gas, land use, water pollution during food production adversely affect the environment (Ulaszewska et al., 2017). In addition, according to LCA studies, the greenhouse effect of grains, legumes, soy, fruit and vegetables is lower than that of red meat, chicken, fish and dairy products (Tilman et al., 2014).

It was determined that 168 of the participants (55.3%) stated that animals who have the greatest harm to the environment are cattle, 177 participants (58.2%) stated animal milk as the most harmful animal-based protein source for the nature. Cattle beef is the product with the highest greenhouse effect among all the animal-based products, (Cleveland et al., 2017). De Vries and De Boer reported in their studies that higher use of soil and energy is required for the production

of 1 kg of beef, than for production of 1 kg of pork, eggs and milk (De Vries et al., 2010). Schiessl and Schwagerl have shown in their study that those who eat meat contribute 7 times more to greenhouse gas emissions than vegans (Schiessl et al., 2008). In Carlsson-Kanyama et al.'s study of carbon dioxide, methane and nitrogen oxide emissions from farm to table for 22 commonly consumed products in Sweden, the total CO₂, NO₂ and CH₄ equivalents of cheese were found to be 11 and 1.00 for milk (Carlsson Kanyama et al., 2009). It was determined that 202 participants (67.3%) chose rice to be the plant-based product which causes more harm to the nature. The CH₄ gas is released when it is resolved from the rice grown under water conditions (Gonzalez et al., 2011). CH₄ emissions of most of the plant-based products are very low, except for rice (Turner McGrievy et al., 2016).

A statistically significant relationship was detected between the healthy eating pattern and the choice of the richest food group in terms of protein quality ($\chi^2 = 5064$, $P = 0.024$). It has been determined that 190 of the participants (96.4%) who think that animal-based diet is the healthy eating pattern, also think that animal-based products are the richest in terms of protein quality. The Pew Commission for Industrial Livestock Production has announced the issue of a number of public health problems caused by meat production and consumption. Meat production exposes us to a number of adverse health conditions such as increasing the potential for pathogenic and transmissible disease transmission, increasing the risk of foodborne infections, non-therapeutic antimicrobial use and increasing resistance (Rothgerber et al., 2013). Foodborne epidemics and exposure of humans to dioxins and exogenous hormones are often associated with intensive meat production (Graça et al., 2016).

It has also been stated in a conference on Sustainable Food Consumption that excessive meat consumption can lead to obesity, diabetes, cardiovascular diseases and cancer (Salter, 2017). As mentioned in the conference on "sustainable food consumption", plant-based products have a

much more positive contribution to health than animal-based products, due to the high levels of complex carbohydrates, and low levels of saturated fat, cholesterol and purine content (Von Koerber et al., 2017). As stated by Rogerson in his study, cardiovascular disease, hypertension, type 2 diabetes, cholesterol and cancer are less common in vegans (Rogerson, 2017).

A statistically significant relationship was found between the healthy eating style and preference for food group that is harmful to the nature ($\chi^2 = 11286$; $P = 0.001$). It has been determined that 142 participants (73.2%), whose healthy eating pattern is animal-based, chose animal based-products as harmful to nature, and 52 participants (26.8%) stated the notion that plant-based products cause more harm to the nature.

A statistically significant relationship was detected between healthy eating pattern and choice of food group for less harm to the nature ($\chi^2 = 25490$; $P = 0.000$). It has been determined that 126 participants (64.6%) who responded the products to be preferred for less harm to the nature as plant-based products, chose the healthy eating pattern as animal-based.

There is a statistically significant relationship between the eating pattern that causes more harm to the nature and products to be preferred for less harm to the nature, ($\chi^2 = 28760$; $P = 0.000$). Those who think that the products to be preferred for less harm to the nature are only herbal products or plant-based products, in grate rate, have marked animal-based products to be more harmful to the nature. The questions assessed in this section used positive and negative statements of similar questions to determine whether the participants would respond consistently. As a result of the evaluation, the participants gave consistent responses that gave statistically significant results. Westhoek et al. in their study of switching 25-50% of animal-based products with plant-based products in European Union to examine effects on the basis of dietary energy, have found that reducing the consumption of meat, dairy products and eggs by half, provides significant benefits both in terms of environment

and health. As a result of the work, it is expected that such a dietary change will have a substantial improvement in both air and water quality in the European Union (Westhoek et al., 2011).

A statistically significant relationship was found between the healthy eating pattern and the environmentally more harmful meat group product ($\chi^2 = 12757$; $P = 0.005$). It was found that 95 participants (49.0%) whose healthy eating pattern is animal-based, cattle is more harmful to the nature. Beef production has impacts such as climate change, acidifying and consumption of natural resources (Berton et al., 2017). Reducing beef consumption and preferring plant-based products instead of beef could reduce the greenhouse effect by 35% (Meyer et al., 2017).

There is a statistically significant relationship between environmentally more harmful eating pattern and environmentally more harmful meat group product ($\chi^2 = 26332$; $P = 0.000$). Hallström et al. found that the most effective way to reduce greenhouse gas effect was the vegan diet. In the study, it was stated that vegan diets reduced the greenhouse effect by 50%. In the same study, it was stated that lacto-ova is second in reducing greenhouse effect among vegetarian diets (Hallström et al., 2015). In addition, other studies have also indicated that more global-based transition towards plant-based dieting is vital for reducing the ecological footprint of food systems, and for meeting the regulatory capacity of the earth (Graça et al., 2016).

A statistically significant relationship was found between gender and the type of food that is more harmful to nature ($\chi^2 = 8699$; $P = 0.003$). A statistically significant relationship was found between gender and meat group products that are more harmful to the nature ($\chi^2 = 19906$; $P = 0.000$). A statistically significant relationship was found between gender and Change of eating pattern status for less harm to the nature ($\chi^2 = 13396$; $P = 0.000$). It was determined that 191 female (69.7%) participants could support this change and 21 male participants (61.8%) would not support this change. In a survey of 1046 UK citizens, more than 25% of respondents

said that they were thinking of reducing meat consumption. However, less than 25% of those claiming to reduce meat consumption actually do so (Richardson et al., 1993). Likewise in Denmark, negative attitudes towards meat are increasing, but no changes in the behaviour has been reported. (Holm et al., 2000). Chin, Fisak, and Sims found low-level anti-vegetarian feelings in the study with American university students (Chin et al., 2002). Gender is an outstanding factor in attitudes towards vegetarianism. Compared to males, females have stronger negative attitudes towards animal use (Knight et al., 2004). Although the link between meat and the environmental impact is lacking as a result of the study of the perceptions of the environmental impact of the food system and the willingness to reduce environmental meat consumption with young people at five different schools in Scotland during the 2013-2014 period in which a total of 103 participants attended, when provided with this information, participants were still reluctant to consider reducing meat consumption. If the diet needs to be changed to improve health and reduce environmental impacts, cultural, social and personal values around the meat should be accepted and integrated into the scientific debate on sustainable diets (Campbeel et al., 2016). Gender is generally regarded as a strong indicator of meat consumption and shows that men generally have a higher consumption level than women (Graça, 2016). Many men in North America do not think that a meal without meat is a "real" meal [51] (Sobal, 2005). In the world, men consume more meat than women (Rothgerber et al., 2013). Several studies have also shown that consumption of meat is related to male gender. For example, those who consume meat are perceived as more masculine than those who don't (Graça, 2016). Stibbe's review of six issues related to Men's Health between June and December 2000 has linked the fact that meat, especially red meat, is associated with positive images of masculinity, as one of the characteristics of ideal man, especially with increasing muscle strength (Rothgerber et al., 2013).

A statistically significant relationship was found between the Nutrition and Dietetics, Physical Therapy and Rehabilitation and Nursing

Departments in terms of food products causing more harm to the nature ($\chi^2 = 6648$; $P = 0.036$). This result may stem from the fact that information about animal and plant-based eating patterns are referred during the training of the students of the Department of Nutrition and Dietetics.

CONCLUSION

It is concluded that most people think that animal-based products are healthy but these products harm the nature. They are of the same opinion particularly on the notion that cattle harm the nature more. Many of the participants say that they can change their eating habits to protect nature and lessen the harm to the environment. It is seen that men are more abstaining in this regard. In short, it is obvious that the plant-based diet is more climate-friendly compared to the omnivorous diet. In order to achieve more sustainable consumption patterns, commitment and action are required throughout the entire food system from producers and retailers to government. It should be known that the concept of "Foodways" being used in the world is important here, and that every stage of food delivery to the consumer is important for sustainability.

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