Determination of Probiotic Food Consumption Habits of University Students: The Example of Selçuk University

Üniversite Öğrencilerinin Probiyotik Besin Tüketim Alışkanlıklarının Belirlenmesi: Selçuk Üniversitesi Örneği

Didem ÖNAY DERİN[1], Nuran ERDEM[2]

ABSTRACT

The aim of this research was to determine of probiotic product consumption habits of university students. Research population is composed of 400 students who currently attending department of Food Engineering, Faculty of Agriculture at Selçuk University. The research data were collected by means of the face-to-face interviewing technique from a survey form developed by the researchers between May and October 2016. Questionnaire form is composed of various questions to determine general knowledge, probiotic food consumption of the students. While evaluating the date, SPSS package programme was used and necessary statistical analysis was made. 50.5% of students weren't being knowledgeable about the probiotic product. More than half (56.3%) of students said that they consumed probiotic products. The students' which consuming probiotic food consumption frequency was once a day with a rate of 35.9%, 65.0% of the students have stated that they consume probiotic productions alone as such. The students wasn't know the use of microorganisms in probiotic food products with a rate of 79.8%, they wasn't reading the packaging information when purchasing these products with a rate of 7.7%, and they were proposing probiotic food consumption to other people with a rate of 80.3%.

Keywords: Probiotic, University Students, Consumption Habits, Probiotic Food

ÖZET

Bu araştırmanın amacı üniversite öğrencilerinin probiyotik ürün tüketim alışkanlıklarını belirlemektir. Araştırmanın evrenini, Selçuk Üniversitesi Ziraat Fakültesi Gıda Mühendisliği bölümünde öğrenim gören 400 öğrenci oluşturmuştur. Araştırma verileri, Mayıs-Ekim 2016 tarihleri arasında, araştırmacılar tarafından geliştirilmiş bir anket formu yoluyla yüz yüze görüşme tekniği ile toplanmıştır. Anket formu öğrenciler hakkında genel bilgiler ve öğrencilerin probiyotik besin tüketim alışkanlıklarını belirlemeye yönelik çeşitli sorulardan oluşmaktadır. Verilerin değerlendirilmesinde, SPSS paket programı kullanılmış ve gerekli istatistiksel analizler yapılmıştır. Öğrencilerin %50,5'inin probiyotik ürünler hakkında bilgilerinin olmadığı saptanmıştır. Öğrencilerin yarıdan fazlasının (%56,3) probiyotik ürünleri tükettikleri belirlenmiştir. Probiyotik gıda tüketen öğrencilerin %35,9'unun tüketim sıklığının günde bir kez olduğu, %65,0'ının probiyotik gıdayı tek başına tükettikleri belirlenmiştir. Öğrencilerin %79,8'inin probiyotik ürünlerin üretiminde kullanılan mikroorganizmaları bilmedikleri, %7,7'sinin bu ürünleri satın alırken ambalaj bilgilerini okumadıkları, %80,3'ünün probiyotik gıdaların tüketimini önerdikleri saptanmıştır.

Anahtar Kelimeler: Probiyotik, Üniversite Öğrencileri, Tüketim Alışkanlıkları, Probiyotik Gıda

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[1] Doç. Dr., Selçuk Üniversitesi Sağlık Bilimleri Fakültesi
[2] Öğr. Gör., Aksaray Üniversitesi Güzelyurt MYO

İletişim / Corresponding Author : Nuran ERDEM, nuran.erdem42@gmail.com
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INTRODUCTION AND PURPOSE

Functional properties of probiotics coupled with consumer's inclination towards healthful foods have projected probiotics as a new ingredient in functional food market.[1] Today, the term "probiotic" refers to "live microorganisms which, administered in adequate amounts, confer a beneficial physiological effect on the host," according to the Food and Agriculture Organization and World Health Organization.[2]

Probiotics were originally used to improve the health of both animals and humans through the modulation of the intestinal microbiota. At present, several well-characterized strains of Lactobacilli and Bifidobacteria are available for human use to reduce the risk of gastrointestinal (GI) infections or treat such infections.[3] Some of the beneficial effects of probiotic consumption include improvement of intestinal health by the regulation of microbiota, and stimulation and development of the immune system, synthesizing and enhancing the bioavailability of nutrients, reducing symptoms of lactose intolerance, and reducing the risk of certain other diseases. Gut microbiota deviations have been associated with enhanced risk of specific diseases; therefore, modulation of an unbalanced indigenous microbiota forms the rationale of probiotic therapy. Also, the development of adjuvant or alternative therapies based on bacterial replacement is becoming important owing to the rapid emergence of antibiotic-resistant pathogenic strains and the adverse consequences of antibiotic therapies on the protective flora, which enhances the risk of infection.[4] Probiotics administered in water or diet also may inhibit the growth of pathogenic microorganisms, contribute digestive enzymes to increase feed utilization, provide other growth-promoting factors, and stimulate the immune response of the organism. Recognized probiotics that may influence fish immunity, disease resistance, and other performance indices include those of the genus Bacillus and various lactic acid bacteria (Lactobacillus, Lactococcus, Carnobacterium, Pediococcus, Enterococcus and Streptococcus). Bacteria of the genus Bacillus are Gram-positive rods that form spores that are resistant to various environmental conditions and thus have extended shelf life. Bacillus subtillis, B. licheniformis, B. circulans, B. coagulans, B. clausii, and B. megaterium all have been used as probiotics. Lactobacillus rhamnosus, L. delbrüeckii, Carnobacterium maltaromaticum, C. divergens, C. inhibens, and Enterococcus faecium are other bacteria that have been used as probiotics, along with yeasts such as Candida sake and Saccharomyces cerevisiae. The bacteria must remain viable during storage and processing for probiotics to confer their beneficial effects, but the application of dead cells, freeze-dried cells, or cell-free extracts or spores have all shown some degree of success.[5]

Worldwide, a diverse array of probiotic products is on the market. Yogurt is perhaps the most common probiotic-carrying food, but the market has expanded beyond yogurt. Cheese, fermented and unfermented milks, juices, smoothies, cereal, nutrition bars, and infant/toddler formula all are food vehicles for probiotic delivery. In addition to being sold as foods, probiotics are sold as dietary supplements, medical foods, and drugs. Often these products are composed of concentrated, dried microbes packaged into capsules, tablets, or sachets. This format is convenient for the delivery of large numbers of microbes that, if manufactured and stored properly, can be quite stable even at room temperature.[6]

Health benefits of probiotics led to a rapid growing interest in probiotics as functional foods in the current era of self-care and complementary medicine. It has been established that viability and metabolic activities of probiotics during food processing, at the point of sale and in host gastrointestinal tract are essential for extending health benefits. Several reports indicated poor viability of probiotics in health products and often present at levels

lower than those claimed on label. For long-term existence of probiotic as functional foods in the world market, it becomes imperative to ensure their higher viability till consumption and ability to exhibit probiotic effect.[7] Probiotics have been shown to be effective against a number of disorders. Some renowned effects are relieving diarrhea, improving lactose intolerance and its immunomodulatory, anticarcinogenic, antidiabetic, hypocholesterolemic, and hypotensive properties.[8] Probiotic bacteria, by competing with enteric pathogens for available nutrients and binding sites, reducing the pH of the gut, producing a variety of components which inactivate viruses, enhancing specific and nonspecific immune responses, and increasing mucin production, can reduce incidence, severity, and duration of diarrhea.[9] However, the use of probiotics should be further investigated for their benefits and possible side effects, if any. The aim of this research was to determine status of probiotic product consumption of university students.

MATERIAL AND METHOD

The aim of this research was to determine status of probiotic product consumption of university students. Research population is composed of 400 students who are currently attending department of Food Engineering, Faculty of Engineering at Selçuk University. Simple random sampling method was used in research and total 208 students consisting of 165 voluntary male student and 43 female students participated to study (participation rate is 52.0%). The research data were collected by means of the face-to-face interviewing technique from a survey form developed by the researchers between May 2016 and October 2016. Prior to the creation of the questionnaire form, literature (thesis, articles, papers, books, scientific researches and the like) related to the subject were examined and then a questionnaire was prepared by using various researches related to this topic.[10-13] The questionnaire contains a variety of questions designed to the introductory information of students and their parents (age, gender, class of students, maternal and paternal education status etc.) and probiotic food consumption of the students. The statistical evaluation of the datas was done using Statistical Package for the Social Sciences Program (SPSS). In the statistical evaluation of the data obtained as a result of the research, tables with average ($\overline{X}$), standart deviation (S), number (n) and percentile (%) values were prepared.

FINDINGS AND DISCUSSION

%79.3 of the students who participated the research was and %20.7 was female. The average age of the students was 19.59±1.97. While it is observed that more than half of mothers of students (58.2%) were graduated from primary school, it was determined that 35.1% of fathers were graduated from high school and equivalent school. Average number of individuals in family was 4.75±1.44, 75.0 of students said that they live in villages, 17.3% of students live in village and 7.7% of students said that they live in town. 60.1% students mentioned that they live in dormitories, 24.0% mentioned that they live in their own houses, 13.9% of students mentioned that they live in student house and 1.9% of them mentioned that they live with their relatives.

It was determined in the study that 50.5% of students do not have information about probiotic products (Table 1). While it was mentioned in a study which was made over students of Marmara University, Faculty of Medicine that 83.7% of student has heard probiotic wording before, and 49.6% of them mentioned that they are not aware of content of probiotics. It was determined in the same study that ratio of being aware about probiotic products by student increase together with rise in monthly income.[14] Yabancı ve Şimşek,[10] in their study they mention that 40.0% of male student and

69.2% of female students have knowledge about products. Aydin et al[11] found on their study which was made for determining probiotic product consumption status for university students who are having education in Isparta Süleyman Demirel University. It was determined that 40.6% of male students and 48.3% of female students were determined to have knowledge about probiotic products.[11] Önay Derin and Keskin,[15] in their study which was made for determining status of consumption of probiotic product in university students who are having education in Ege University, Faculty of Engineering of Food Engineering they determined that 63.2% of male students and 63.6% of female students have knowledge about probiotics (x^2=0.010, p>0.05). Koçak and Kalkan[13], in their study they determined that 67.57% of female students and 31.34% of male students know probiotic nutrient term (p>0.05).

It is observed in previous works in line with this study that more than half of students have knowledge about probiotic food.[10,11,12,13] Probiotic consumption is useful for stimulating and regulation of immune system, preventing and treating infections, treatment of inflammatory intestinal diseases and preventing attacks, preventing lactose intolerances, reducing blood cholesterol, reducing cancer formation, delaying occurrence of allergic reactions in children, and treatment and preventing vaginal and urinary system.[14] Even though Recently particularly consumption of yogurt, kefir and in a study which was made over students of university that 29.2% of male students and 42.5% of female students consume probiotic products. Aydin et al,[8] in a study they determined probiotic product consumption of men and women are respectively other probiotic dairy has increased in many countries it was determined in study that 56.3% of students consume probiotic products (Table 1). It was determined in a study that only 8.3% of students produce probiotic products.[15] In a study which was made over high school students it was determined that 31.9% of female students and 29.9% of male students consume probiotic products. Results of this study are similar with said studies and it was determined that female students consume more probiotic products with respect to male students. It was determined in similar two studies which is made over 10-15 age group that yogurt including probiotic is the dairy which consumed with least ratio after kefir and kumiss, (respectively 46.0% and 58.2%).[16,17] It was determined that ratio of students who never consumes milk and dairy with probiotic was determined as 67.8% and ratio for students consuming everyday was found as 2.6%. It was found in similar study that 61.6% of students do not consume probiotic products.[12] Koçak and Kalkan,[13] in a study they determined that 46.10% of students consume yogurt with probiotic, with same ratio 19.86% of students consume probiotic ayran, 12.06% of students consume probiotic ice cream, and 2.13% of students consume probiotic kefir.

Table 1. Findings Regarding with Status of Probiotic Food Consumption of Students

Probiotic products knowledge state (n=208)	**n**	**%**
Consider them as know	103	49.5
Do not consider them as know	105	50.5
Probiotic products consumption state (n=208)		
Consume	117	56.3
Not consume	91	43.8
Reasons for consumption probiotic products (n=117)		
Reason of health problems	9	7.6
Reason of recommendation	12	10.3
For getting thin	12	10.3
Since it facilitates digestion	84	71.8
Consumption frequency (n=117)		
Once a day	42	35.9
2-3 times a day	7	6.0
Every other day	14	12.0
Once a week	21	17.9
Once every 15 days	16	13.7
Once a month	17	14.5
Compsumption style (n=117)		
Alone	76	65.0
Together with macaroni and rice	35	29.9
Together with biscuit, chocolate and other products	6	5.1
Consumed meal (n=117)		
Morning	11	9.4
Noon	31	26.5
Evening	61	52.1
Before the go to bed	14	11.0
Reasons for not consumption probiotic products (n=91)		
For not knowing	44	48.4
For not found natural	6	6.6
For not needing	28	30.8
For found expensive	5	5.5
For found tasteless	8	8.8

In study majority of students (71.8%) consuming probiotic products mentioned that they consume probiotic since it facilitates digestion, ratio of 10.3% follows this with reason of recommendation and 10.3% follows this with reason for getting thin (Table 1). It was determined in a study that almost half of students (48.4%) mentioned reason for not consuming these products as they do not consume products that they do not know and 30.8% if students mentioned that they do not need these products. It was observed that students consuming these products mentioned factor effecting consuming these products as advertisements 31.6%, health problems 27.9%, recommendation 22.1%, education which is taken in school 18.4%. 305 students who do not consume these products mentioned significant reason for not consuming these products as they do not know (49.2%), these products 43.5%, that they do not consider them as natural (5.9%), that they consider them as expensive (4.3%) and tasteless (1.9%).[14] Yabancı and Şimşek[10] in a study they determined that students mentioned most important reason for not consuming probiotic products as they do not have knowledge about them, (43.5%), ones which think that they are not natural (%19.5), they are tasteless (8.5%) and expensive (%12.9) followed these reasons. It was found in similar study that students who has participated to this study and do not consume 54.7% these products mentioned that they do not know %54.7 this product, they do not need this product 24.8%, they do not considered as natural, they consider it tasteless 10.4% and, %4.4 expensive[11]. It was determined in study for reasons for not consuming product was found as 35.5% for not requiring, 23.1% for not requiring it, 22.6% for not considering as natural, 10.8%for considering as expensive, 8.1% for considering as tasteless.[18] In this study, most significant reason for not consuming this product was determined as not having knowledge about product 48.4% and it was determined that results of studies which were conducted about this subject have similarities.[10,11,18] It is considered as having knowledge about probiotics and not making public aware about this product limits consumption. It was found in study that more than half of 52.1% of students within scope of study consume probiotic products in evening meal. When frequency of consuming probiotic products by students is considered it is determined that 35.9% of them consume once a day, 17.9% of them consume once a week 14.5% of them consume once a month, 13.7% of them consume in every 15 days, 12.0% of them consume in every 2 days, 6.0% of them consume 2-3 times a day, 65.0% of students consume probiotics alone, 29.9% of them consume together with macaroni and rice 5.1% of them consume

together with biscuit, chocolate and other products (Table 1). Yabancı and Şimşek,[10] in a study they determined that 39.2% of female students mentioned that they consume this product once a day, and 28.6% of male student mentioned that they consume this product rarely. It was determined in a study that consumption frequency for this product by students is examined, it can be observed that mostly female and male students consume this product mostly once a week (respectively 31.0%, 31.1%) and it can be observed that as being similar with our study 58.6% of female students and 66.0 of male students consume this product alone without any food.[12] In a similar study it was determined that 31.91% of students consume once a day, 27.66% of students consume once a week 20.57% of students consume a few times a day, 17.73% of students consume rarely, 2.13% of students consume probiotic products 1-3 times a month. It was determined in same study was determined that 58.87% of students consume probiotic products with meal, 32.62% of students consume it alone, 4.96% of them consume together with macaroni and rice, 3.55% of them consume together with fruits.[13]

It was determined according to study results that 75.2% of students consuming probiotic products mentioned that they consume them by loving it, 92.3% of them mentioned that they read labels while they are purchasing products, 58.2% of them mentioned that they got benefit from these products, 80.3% of them mentioned that they advise these products to their surroundings, 65.0% mentioned that they consider prices for them as normal, 83.3% of them mentioned that they store them in freezer. The students wasn't know the use of microorganisms in probiotic food products with a rate of 79.8%.

It was mentioned in other study that 79.5% of students mentioned that they consume this product by loving it, 84.2% of them mentioned that they read packaging for this product, 80.0% of them mentioned that they got benefit from this product, and 82.1% of them mentioned that they recommend this product to their surroundings. More than half of students mentioned that they consume probiotic products alone, 31.1% of them mentioned that they consume together with macaroni and rice, 63.1% of them mentioned that they consume together with foods such as biscuit and chocolate.[12] It was mentioned in a study which was made over students of university that 88.4% of students consuming probiotic products mentioned that they consume these products by loving them, 79.1% of them mentioned that they are influenced from advertisements, and 84.9% of them mentioned that they got benefit from this product.[10] Balkış[18] found that 64.3% of students consuming probiotic products mentioned that they recommend to their surroundings, same ratio 64.3% mentioned that they read packaging labels. It was determined in a study that it was observed that majority such as 82.98% ratio got benefit from products, more than half of students 52.48% do not like probiotic products, more than half of students %59.57 read packaging information and majority such as 80.14% of students recommend to surrounding.[13]

CONCLUSION AND SUGGESTION

It was determined in the study that 50.5% of students do not have information about probiotic products. The student wasn't know the use of microorganisms in probiotic food products with a rate of 79.8%. Probiotics have been shown to be effective against a number of disorders. In study majority of students (71.8%) consuming probiotic products mentioned that they consume probiotic since it facilitates digestion, ratio of 10.3% follows this with reason of recommendation and 10.3% follows this with reason for getting thin. The positive effects on health and nutrition of probiotic foods should be explain more consumers and made efforts to increase of these product consumption. Besides its therapeutic effects, and because of its productive effects, the significance of probiotic products should be emphasized and raised the awareness of public on this matter.

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