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# Sustainable eating behavior: An examination in the context of restaurant customers
# Sürdürülebilir yeme davranışı: Restoran müşterileri özelinde bir inceleme

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**ABSTRACT:** This study aims to develop a deeper understanding of the impact of demographic characteristics on sustainable eating habits within restaurants. Based on data collected from 401 participants and grounded in the Sustainable and Healthy Eating Behavior scale, this study presents findings using a quantitative methodology. The results reveal significant variability in healthy eating practices across different social groups, with overall participation in these habits being moderate. Specifically, practices related to the consumption of seasonal foods and the avoidance of food waste—both indicative of strong awareness of food preservation—received the highest levels of participation. In contrast, dimensions such as animal welfare, local food consumption, and meat reduction exhibited the lowest levels of participation, suggesting areas where awareness remains comparatively lower. Demographic analyses revealed that older and married participants were more inclined towards sustainable eating behaviors than younger and single participants. The study also found a positive correlation between higher income levels and greater awareness and practice of sustainable eating behaviors. As participants' income levels increased, their awareness and engagement with sustainable eating practices also increased. These findings highlight the need for educational initiatives to promote sustainable eating habits, particularly among younger and more highly educated participants, to increase awareness and adoption of such behaviors.
**Keywords:** Sustainability, Sustainability gastronomy, Sustainable eating behaviour

**ÖZ:** Bu çalışmanın amacı, demografik özelliklerin sürdürülebilir yeme alışkanlıkları üzerindeki etkisini restoran müşterileri özelinde incelemektir. Çalışmada nicel bir yöntem belirlenmiş, sürdürülebilir ve sağlıklı beslenme ölçeği kullanılarak 401 katılımcıdan veri toplanmıştır. Bulgular farklı sosyal gruplar arasında sürdürülebilir yeme alışkanlıklarında önemli farklılıklar olduğunu, ancak genel katılımın orta düzeyde olduğunu göstermektedir. Özellikle mevsimsel gıdalar ve gıda atıklarını azaltmakla ile ilgili uygulamalar güçlü bir farkındalık sergileyerek en yüksek katılım düzeyinde gerçekleşmiştir. Buna karşın, hayvan refahı, yerel gıda tüketimi ve et tüketiminin azaltılması gibi boyutlar en düşük katılım düzeylerini göstererek bu alanlarda farkındalığın nispeten daha düşük olduğunu ortaya koymaktadır. Demografik analizler, yaşlı ve evli katılımcıların, genç ve bekar katılımcılara kıyasla sürdürülebilir yeme davranışlarına daha fazla eğilim gösterdiklerini ortaya çıkarmıştır. Çalışma ayrıca, yüksek gelir seviyeleri ile sürdürülebilir yeme davranışlarına yönelik farkındalık ve uygulama arasında pozitif bir korelasyon bulmuştur. Gelir seviyeleri arttıkça, katılımcıların sürdürülebilir yeme davranışlarına olan farkındalıkları ve katılımları da artmaktadır. Bu bulgular, özellikle daha genç ve yüksek eğitim düzeyine sahip katılımcılar arasında sürdürülebilir yeme alışkanlıklarının farkındalığını artırmak amacıyla yapılacak girişimlerin gerekliliğini vurgulamaktadır.
**Anahtar Kelimeler:** Sürdürülebilirlik, Sürdürülebilir gastronomi, Sürdürülebilir yeme davranışı

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## GENİŞLETİLMİŞ ÖZET

### Literatür taraması

Sürdürülebilirlik, bugünün kaynaklarını kullanırken gelecek nesillerin de aynı kaynakları kullanım haklarını göz önünde bulundurma felsefesine dayanmaktadır (Blackstone, 2018). Sürdürülebilirlik multidisipliner bir çalışma konusudur. Enerji, mühendislik gibi pek çok alanı ilgilendiren bu kavram gastronomi ile de yakından ilgilidir. Gastronomi, gıda ihtiyacının karşılanması, kültürel devamlılık, çevresel kaynakların optimum kullanımı ve yerel ekonomilere katkı sağlama açısından kritik öneme sahiptir (Süzer, 2022). Bu nedenle, gastronomi disiplininin sürdürülebilir bir bakış açısına sahip olması büyük önem taşır. Sürdürülebilir gastronominin yerleşebilmesi için toplumda yeme alışkanlıklarının sürdürülebilir bir formda olması önemlidir. Zira sürdürülebilir yeme alışkanlıkları beraberinde talebi getirecek ve gıda arzı sağlayıcılarını daha sürdürülebilir alternatiflere yönlendirecektir.

Sürdürülebilir yeme alışkanlıkları çeşitli dinamiklerden oluşmaktadır. Tüketilen ürünlerde kalite etiketlerine dikkat etmek bunlardan biridir. Tüketicilere ürünlerin belirli standartlara uygun olduğunu ve belirli kalite kriterlerini karşıladığını gösteren bu etiketler (coğrafi işaret, yerel üretim vb.) aynı zamanda yerel ekonomiyi, toplumu da desteklemektedir. Benzer şekilde mevsimsel gıdaların tercih edilmesi de önemlidir. Mevsimsel beslenme depolama ihtiyacını ortadan kaldırarak enerji tasarrufu sağlar ve karbon ayak izini düşürür. Doğal kaynakların aşırı kullanımını da sınırlandırır. Yerel gıdaların tercih edilmesi de sürdürülebilir yeme açısından kritiktir. Yerel gıdalar belirli bir kilometrekare içerisinde, belirli yöntemlere ve dinamiklere dikkat edilerek üretilen gıdalardır. Yerel gıda tüketimi yerel toplumu, ekonomiyi destekler. Benzer şekilde yereldeki kültürlerin korunmasını sağlar ve çevresel kaynakların daha sağduyulu şekilde kullanılması anlayışını beraberinde getirir (Żakowska-Biemans, 2019).

Et ve yağ tüketiminin azaltılması da sürdürülebilir yeme davranışı açısından önemlidir. Hayvansal bazlı ürünlerin üretimi ve tüketimi ekolojik ayak izini artırmaktadır. Hayvansal ürünlere olan talepte aşırıya kaçılmaması, optimum seviyede tutulması önemlidir. Zira aşırı tüketimin beraberinde getirdiği aşırı üretim doğal kaynakları ciddi ölçüde tahrip etmektedir (Machovina et al., 2015). Hayvansal ürünlerin tüketimi noktasında bu ürünlerin elde edildiği canlıların refahı da kritiktir. Hayvan refahı gözetilerek üretilmiş gıdaların (sürdürülebilir balıkçılık, gezen tavuk yumurtası vb.) tercih edilmesi çevresel sürdürülebilirliği desteklemektedir (Fraser, 2008). Bir diğer önemli konu da gıda israfının önlendiği bir tüketim alışkanlığının oluşturulmasıdır. Her yıl milyonlarca ton gıda, üretimden tüketime kadar olan süreçte israf edilmekte, bu durum hem çevresel hem de ekonomik kaynakların gereksiz yere harcanmasına neden olmaktadır (Mourad, 2016). Sürdürülebilir yeme konseptinin kapsayıcı bileşenlerinden biri de sağlıklı ve dengeli beslenmedir. Dengeli ve yeterli beslenme eğilimi bireylerin sağlıklı kalmalarında önem arz etmektedir. Benzer şekilde bireylerin sağlıklı olmaları daha az sağlık vb. harcamasına sebep olmakta, çevresel ve ekonomik sürdürülebilirliğe katkıda bulunmaktadır (Leitzmann, 2011).

### Yöntem

Bu çalışmanın amacı sürdürülebilir yeme davranışının demografik değişkenler özelinde ne gibi farklılar gösterdiğini belirlemektir. Bu noktada nicel bir araştırma yöntemi benimsenmiş verestoran müşterileri özelinde anket uygulaması gerçekleştirilmiştir. Müşterilerin tutumlarını ölçmek için Żakowska-Biemans et al. (2019) tarafından geliştirilen 'sürdürülebilir ve sağlıklı yeme davranışı ölçeği' temel alınarak hazırlanan bir anket kullanılmıştır. Kullanılan ölçek standart çevir – geri çevir tekniği kullanılarak (Brislin, 1976) Türkçeye uyarlanmıştır.

Araştırma Safranbolu bölgesinde gerçekleştirilmiştir. Hazırlanan anket formu Tripadvisor derecelendirme sitesinde en yüksek oyu almış 4 restoranda yüz yüze toplanmıştır. İlgili restoranlar Safranbolu'da yer alan popüler restoranlardır ve anket uygulaması için daha geniş bir katılımcı kitlesine ulaşma imkânı sunmaktadır. Araştırmanın veri toplama aşaması Kasım-Aralık 2023 tarihlerinde gerçekleştirilmiştir. Örnek kütleye ulaşmanın zorluğu nedeniyle tesadüfi olmayan örnekleme yöntemlerinden kolayda örnekleme yöntemi kullanılmıştır. İlgili tarihler arasında 417 anket toplanmış ve 401 anket geçerli kabul edilip analizlere dahil edilmiştir. Katılımcıların seçiminde sağlıklı

beslenmelerine dair bir kriter aranmamış, restoranların genel müşteri kitlelerinin eğilimlerini ölçmek hedeflenmiştir.

Elde edilen anketler çeşitli analizlere tabi tutulmuştur. Fark testlerine geçmeden önce ölçeğe doğrulayıcı faktör analizi uygulanmıştır. Çalışmada, geçerliliği önceden sağlanmış ve detaylı bir şekilde açıklanmış olan bir ölçekten (Żakowska-Biemans, 2019) yararlanılmıştır. Bu nedenle, ilgili ölçeğin yapısını doğrulamak için Doğrulayıcı Faktör Analizi (DFA) yapılmasının yeterli olduğu kabul edilmiştir. Devamında istatistiksel analizler yapılmış ve ardından demografik özelliklere göre farklılıkları belirlemek için fark testleri gerçekleştirilmiştir. İlgili analizler için bazı paket programlar [SPSS (Statistical Package for Social Sciences) for Windows ve AMOS (Analysis of Moment Structures)] kullanılmıştır.

**Bulgular ve tartışma**

Çalışmada öncelikle ölçek yapısını doğrulamak için birinci düzey doğrulayıcı faktör analizi (DFA) uygulanmıştır. Standartlaştırılmış regresyon katsayıları incelendiğinde referans değer olan 0,50'nin altında 3 ifade tespit edilmiş ve analizden çıkarılmıştır. Uyum iyiliği değerleri kontrol edildiğinde kabul edilebilir düzeydedir ve çoklu uyum iyiliği sağlanmaktadır. Ölçek DFA sonucunda 7 boyut 31 ifade ile doğrulanmıştır. Ölçeğe dair fark analizlerine geçmeden önce normal dağılım kontrol edilmiştir. Çarpıklık ve basıklık değerlerinin -1,346 ve +1,483aralığında olduğu tespit edilmiş ve parametrik testlerin uygulanabilirliğine karar verilmiştir.

Öncelikle cinsiyete göre farklılıklar kontrol edilmiş ve ölçek boyutlarının herhangi birinde anlamlı bir farklılık olmadığı tespit edilmiştir. İkinci olarak medeni durum incelenmiş ve anlamlı farklılıklar tespit edilmiştir. Bu farklar incelendiğinde ölçeğin tüm boyutlarına evlilerin bekarlara göre daha yüksek katılım göstermesi dikkat çekicidir. Evlilik sürdürülebilirlik bilincini yükseltmektedir. Ardından yaş değişkeni incelenmiştir ve ölçeğin bazı boyutlarında anlamlı farklar tespit edilmiştir. Oluşan farklar incelendiğinde yaşlıların gençlere göre daha yüksek katılıma sahip oldukları görülmektedir. Sağlıklı ve dengeli beslenme, kalite etiketleri, et tüketimini azaltma, yerel gıda, hayvan refahı ve düşük yağ tüketimi boyutlarında en yüksek katılıma sahip grup 45+ olmuştur. Kalan boyutlardaki katılımlar ve farklar incelendiğinde de 35-44 yaş aralığının ön plana çıktığı görülmektedir. Sürdürülebilir yeme davranışı hususunda yaşlılar gençlere göre daha isteklidir.

Katılımcıların eğitim durumu dikkate alındığında da ölçeğin bazı boyutlarında farklar tespit edilmiştir. Fark tespit edilen boyutlarda (Sağlıklı ve dengeli beslenme, kalite etiketleri, et tüketimini azaltma, yerel gıda, hayvan refahı) düşük eğitim grupları yüksek eğitim gruplarına göre sürdürülebilir yeme özelinde daha yüksek katılım göstermiştir. İlkokul ve lise eğitim seviyesinde olan insanlar diğer eğitim seviyelerine sürdürülebilir yeme özelinde daha isteklidir. Son olarak gelir durumuna göre farklılıklar incelenmiştir. Fark tespit edilen boyutlar (Sağlıklı ve dengeli beslenme, kalite etiketleri, yerel gıda, hayvan refahı ) aylık gelir özelinde incelendiğinde yüksek gelir gruplarının düşük gelir gruplarına göre daha istekli oldukları görülmektedir. Aylık gelirin azalmasının sürdürülebilir yeme davranışını olumsuz etkilediğini söylemek mümkündür.

**Sonuç ve öneriler**

Sürdürülebilir bir gastronomi anlayışının inşa edilebilmesi için sürdürülebilir yeme talebi olması şarttır. Bu nokta da sürdürülebilir yeme davranışının rolü büyüktür ve dinamiklerinin ortaya çıkarılması önem arz etmektedir. Elde edilen bulgular incelendiğinde sürdürülebilir yeme ölçeğine olan katılım yüksek düzeyde değildir. Örneklem özelinde sürdürülebilir yeme bilincinin çok gelişmediğini söylemek mümkündür. Ölçek boyutları incelendiğinde en az katılım et tüketimini azaltma boyutundadır. Bayram vd. (2023) tarafından gerçekleştirilen çalışmada da ilgili boyut en az katılım sağlanan boyut olmuştur. Katılımın az olduğu ikinci boyutta yerel gıda tüketimi ve hayvan refahıdır. Yeşildemir (2023) tarafından gerçekleştirilen çalışmada da en az frekansa sahip boyut yerel gıda olmuştur. Yerel ekonomiyi, yerel toplumu ve yerel üretimi desteklemek için yerel gıda tüketimini tercih etmek önemlidir. Bu noktada bilinçlendirme çalışmalarının yapılması önem arz etmektedir.

Bu çalışma, Safranbolu'da sürdürülebilir yeme eğilimlerini analiz ederek önemli bulgular sunmaktadır. Sonuçlar, katılımcıların sürdürülebilir yeme eğilimlerinin genel olarak ortalama düzeyde olduğunu göstermektedir. Demografik analizler, yaşlı bireylerin ve evlilerin daha sürdürülebilir beslenme

alışkanlıklarına sahip olduğunu ortaya koymaktadır. Bu bağlamda, sürdürülebilir beslenme bilincini artırmak için genç nüfusa yönelik eğitimlerin ve bilinçlendirme kampanyalarının artırılması önerilmektedir. Gelecek çalışmalarda, farklı bölgelerde benzer analizler yapılarak sonuçların genellenebilirliği araştırılabilir ve sürdürülebilir yeme eğilimlerini artırmak için daha geniş çaplı stratejiler geliştirilebilir. Tek örneklemde yapılması, kesitsel veri toplanması, yalnızca nicel yöntem kullanılması ve kolayda örnekleme kullanılması bu çalışmanın bazı sınırlılıklarındandır.

## Introduction

Throughout history, the increasing trend of production reached an excessive level with the Industrial Revolution. This overproduction has triggered intensive resource consumption and led to the growing importance of the concept of sustainability. Sustainability is defined as the capacity to act responsibly in a way that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (Süzer, 2023). It holds great significance in terms of the conscious use and preservation of natural resources for future generations. Similarly, the use of water, soil, and energy contributes to the protection of ecosystems and biodiversity (Yılmaz Turgut, 2012). Sustainability is a multidisciplinary field of study. This concept, which concerns various areas such as energy and engineering, is also closely related to gastronomy. A sustainable gastronomy and nutrition approach is essential for a sustainable planet.

Food consumption is one of the activities that involves the most intensive use of environmental resources. Adopting sustainable nutrition and gastronomy habits not only reduces environmental impacts but also serves as a solution to improve public health (Hallström, 2014; Blackstone, 2018). Besides, it supports local culture and economy. To achieve this, an increase in nutrition literacy is essential. Sustainable eating behavior is a key component of nutrition literacy, and it is a critical parameter for both the sustainability of the planet and human health (Teng & Chih, 2022). In this context, it is important to examine the dynamics of sustainable eating behavior.

This study aims to analyze sustainable eating tendencies within a sample conducted in Safranbolu. The primary objective of the study is to reveal the sustainable eating tendencies of the participants and the differences in these tendencies based on demographic characteristics. By doing so, the current state of sustainable eating awareness and the areas that need improvement can be identified. This study specifically examines the participants' tendencies regarding reducing meat consumption, consuming local foods, and preventing food waste, thus shedding light on the level of awareness in these dimensions. The findings will contribute to the development of strategies aimed at necessary education and awareness-raising efforts to increase awareness of sustainable nutrition.

## Literature review

The concept of sustainability broadly encompasses environmental, economic, and social issues, which necessitates a balanced approach across various domains, ranging from the conservation of natural resources to the enhancement of societal well-being and human health (Morelli, 2011). The balanced and future-oriented use of natural resources is referred as environmental sustainability (Turner, 2008). Economic sustainability, on the other hand, concerns ensuring sufficient resources for future generations while meeting the economic needs of today and maintaining economic equity (Ikert, 2012). Social sustainability, another dimension of sustainability, seeks to address issues related to social capital, social policies, inter-institutional communication, and inequality. Moreover, some social and cultural issues may also fall within the domain of social sustainability (Eizenberg & Jabareen, 2017). Sustainability is a multidimensional concept, and achieving true sustainability requires harmonious progress across all dimensions. A truly sustainable system must be concerned with environmental, economic, and social aspects (Kent, 2015).

The philosophy of sustainability focuses on the use of existing resources and their transfer to future generations. One of the fields where this philosophy is most evident is gastronomy. Gastronomy is of critical importance in terms of meeting food needs, ensuring cultural continuity, optimizing the use of environmental resources, and contributing to local economies. Therefore, it is crucial that the discipline of gastronomy adopts a sustainable perspective (Süzer, 2022). A sustainable food system is generally defined as continuously ensuring food security and quality without endangering the availability of sustainable food resources for future generations (Wünsche & Fernqvist, 2022). The fundamental characteristics of sustainable food systems can be identified through methods that improve energy and water efficiency, nutrition, health, and reduce food waste. These systems are designed to ensure food security for future generations and improve global quality of life by working in harmony with nature, society, and the economy (Hill, 2007).

Given the significant impact of food production and consumption on human health and the environment, it is of great importance to societal well-being (Stylianou, 2018). For sustainable food systems to develop, a sustainable gastronomy and nutrition approach must be established. A sustainable nutrition approach has low environmental impacts and contributes to food security and a healthy life for future generations. Sustainable nutrition respects and preserves biodiversity and ecosystems. It is also culturally acceptable, accessible, economically fair, affordable, nutritionally adequate, safe, and healthy (Burlingame & Dernini, 2010). An ideal nutrition system is one that is healthy, of sufficient quality and quantity, affordable, safe, and culturally acceptable (Donati et al., 2016). From this perspective, establishing a sustainable nutrition approach is essential both for a sustainable planet and life, and for a healthy lifestyle. A study on sustainable and healthy eating highlighted eight main dimensions of this concept: (1) healthy and balanced eating, (2) quality labels (regional and organic), (3) reducing meat consumption, (4) preferring local foods, (5) low-fat content, (6) preventing food waste, (7) animal welfare and (8) seasonal food consumption (Żakowska-Biemans, 2019).

Healthy eating refers to consuming the nutrients needed by the body in a balanced and conscious manner. These nutrients are necessary to meet energy needs, support growth, ensure the proper functioning of organs, and maintain overall health. Adequate and balanced nutrition plays a critical role in achieving and maintaining good health. The human body can adapt to various dietary patterns, indicating that different forms of nutrition can support health and nutritional well-being (Leitzmann, 2011). One of the important aspects of sustainable nutrition is quality labels. Quality labels refer to marks that indicate to consumers that products meet certain standards and criteria of quality. Such labels support the local economy while offering consumers fresh and often more nutritious products. In the field of gastronomy, the use of regional and organic labels supports sustainability in various ways and promotes healthy eating (Donati et al., 2016).

Historical analysis shows that meat production and consumption have significantly increased over time. Animal-based products, especially meat production and consumption, considerably increase the ecological footprint. Reducing the demand for animal food products and ensuring their optimal consumption is essential for sustainability (Machovina et al., 2015). The intensive meat production resulting from excessive meat consumption negatively impacts environmental sustainability. Animal husbandry consumes a significant portion of freshwater resources, and the waste generated during the production process increases water pollution (Krauß et al., 2016). Another key factor for sustainability is the consumption of local foods. Local foods are produced within a specific geographical area with attention to particular methods and dynamics. The preference for local foods by consumers increases local food production; and encourages local producers, the economy, and culture (Apak & Gürbüz, 2023). Local foods have great potential to enhance environmental and economic sustainability and play a critical role in the success of sustainability initiatives. These foods introduce the culture of the destination while offering sustainable opportunities for the local population (Sims, 2009, p. 321).

An important criterion for sustainable and healthy eating behavior is the consumption of low-fat products. The preference for low-fat products will lead to a reduction in fat production. Low-fat products generally require less land and water. Using vegetable oils instead of animal fats, in particular, results in lower greenhouse gas emissions in agricultural production and allows for more efficient use of natural resources such as soil and water (Tilman & Clark, 2014). One of the most significant factors negatively impacting sustainability is food waste. Waste can occur consciously or unconsciously at every stage of the food chain. Every year, millions of tons of food are wasted in the process from production to consumption, leading to unnecessary expenditure of both environmental and economic resources (Mourad, 2016). Developing a consumption habit is important because it prevents food waste, which directly negatively impacts environmental and economic sustainability.

With the reduction of animal products, the welfare of the animals from which these products are obtained also gains importance. Animal welfare is of great importance for sustainable agriculture and food production. Ethical animal husbandry practices not only improve the quality of life of animals but also contribute to environmental sustainability (Fraser, 2008). As foods produced with attention to animal welfare (such as sustainably sourced fish, free-range eggs, etc.) become more preferred, animal welfare

will improve, leading to a more sustainable form. Seasonal eating is also important in terms of sustainable gastronomy. Seasonal eating is of great importance for sustainable food consumption and production. Consuming seasonal foods reduces the strain on nature and allows for the optimal use of natural resources. Additionally, not demanding out-of-season foods reduces the need for storage and saves energy. Similarly, the duration of food transportation is reduced, and the carbon footprint decreases (Macdiarmid, 2014).

**Methodology**

The aim of this study is to determine how sustainable eating behaviour varies across demographic variables. To examine sustainable eating habits specifically among restaurant customers, a quantitative method was chosen, and a survey was conducted. The survey was based on the 'Sustainable and Healthy Eating Behavior Scale' developed by Żakowska-Biemans et al. (2019) to measure customer attitudes. The scale was adapted into Turkish using the standard translation-back translation technique (Brislin, 1976). Three experts in the field were consulted, and the discrepancies that arose during the translation and back-translation processes were discussed independently. The final version of the scale was achieved under the guidance of these experts. The research population was determined as customers visiting restaurants in Safranbolu, due to various logistical conveniences. The prepared questionnaire was conducted face-to-face in the four highest-rated restaurants on the Tripadvisor review platform. These restaurants are popular establishments located in Safranbolu and provide the opportunity to reach a broader participant base for the survey. Data were collected between November and December 2023. The survey was administered to customers visiting the restaurant in person and completed on paper. No criterion regarding participants' healthy eating habits was sought, as the aim was to assess the tendencies of the general customer base of the restaurants.

To determine the sample size, various formulas were considered, and it was concluded that 383 participants would be sufficient at a 95% confidence level for a population size of 100,000 or smaller (Kozak, 2014). Given the absence of a list or similar resources representing the restaurant customer population, using random sampling methods was challenging. Due to the difficulty in reaching the sample population, a non-random sampling method, specifically convenience sampling, was employed. Convenience sampling allows the researcher to select sample groups that are easily accessible, adding practicality to the research (Saunders, Lewis, & Thornhill, 2016). The demographic characteristics of the participants are presented in Table 1.

**Table 1:** Socio-Demographic characteristics of the participants

| Demographics | Groups | n | % | Demographics | Groups | n | % |
|---|---|---|---|---|---|---|---|
| Age | 18-24 | 130 | 32,4 | Gender | Male | 154 | 38,4 |
| | 25-34 | 143 | 35,7 | | Female | 247 | 61,6 |
| | 35-44 | 72 | 18 | Marital status | Married | 169 | 42,1 |
| | 45+ | 56 | 14 | | Single | 232 | 57,9 |
| Monthly income | 8501-11500 | 34 | 8,5 | Education level | Primary – High School | 78 | 19,5 |
| | 11501-15000 | 72 | 18,0 | | Associate degree | 67 | 16,7 |
| | 15001-25000 | 58 | 14,5 | | Bachelor | 191 | 47,6 |
| | 25000+ | 125 | 31,2 | | Postgraduate | 65 | 16,2 |

A 5-point Likert scale was used to apply the scale. A total of 417 surveys were collected during the specified period, and 401 of these were deemed valid and included in the analyses. The collected surveys were subjected to various analyses. First, an exploratory factor analysis (EFA) was conducted to determine the distribution of the scale items and dimensions within the sample. The reason for conducting the EFA was that the scale had been developed in another country and culture. Following the EFA, a confirmatory factor analysis (CFA) was performed to validate the structure obtained from the exploratory analysis. Descriptive statistical analyses were conducted, and then difference tests were carried out to determine the variations according to demographic characteristics. Some software

packages [SPSS (Statistical Package for Social Sciences) for Windows and AMOS (Analysis of Moment Structures)] were used for the relevant analyses.

**Findings and discussion**

In this section of the study, analyses were conducted using the data collected. The scale used in this study is one whose validity and reliability have been previously established. Developed by Żakowska-Biemans et al. (2019), the scale comprises 8 factors and 34 items. Therefore, it was deemed beneficial to verify the previously defined structure before proceeding with difference tests. Confirmatory factor analysis (CFA) was conducted to verify the dimensional distribution of the scale and test the construct validity of the tested scales (Büyüköztürk et al., 2017). Based on this information, a first-order confirmatory factor analysis was applied to the scale. Within this analysis, the standardized regression coefficients (factor loadings) were checked. Values below the reference threshold of 0.50 were identified, and items 10, 28, and 32 were subsequently removed from the analysis (Hair et al., 2014). After removing these items, all loadings were above 0.50, were significant ($p<0.001$), and the t-values were at an acceptable level ($p<0.001$ when $t>2.56$). Following this, the goodness-of-fit indices of the model, as seen in Table 2 were checked to assess model fit. Goodness-of-fit indices evaluate the compatibility between the data and the model. If these values are within acceptable ranges, the CFA model is considered valid. To enhance the relevant goodness-of-fit indices, five covariances were drawn in accordance with the rules (see Appendix 1) (Gürbüz, 2019). When assessing the validity of the model, it is important to consider multiple goodness-of-fit indices rather than relying on a single value (Hu & Bentler, 1999; Byrne, 2010).

**Table 2:** First-order CFA model goodness of fit indices of the sustainable and healthy eating behaviors

| Index of Fit | RMSEA | χ2/sd | CFI | SRMR | GFI | TLI | IFI |
|---|---|---|---|---|---|---|---|
| **Conclusion** | 0,49 | 1,97 | ,939 | ,083 | 0,887 | ,930 | ,940 |

Table 2 presents the goodness-of-fit indices for the first-order CFA results of the scale. When considering the overall goodness-of-fit, it is observed that the values fall within the recommended ranges. An examination of the goodness-of-fit indices revealed that the RMSEA, χ2/df, CFI, TLI, and IFI values were at excellent fit levels, while the SRMR and GFI values were at acceptable fit levels (Hu and Bentler, 1999; Byrne, 2016; Gürbüz, 2019). Therefore, it can be concluded that multiple goodness-of-fit criteria were satisfied. Accordingly, the Sustainable and Healthy Eating Behaviors scale was confirmed with 8 dimensions and 31 items. Before proceeding to the descriptive and difference analyses of the validated scale, the normality of the distribution was checked. The skewness and kurtosis values were found to range between -1.346 and +1.483, indicating they fall within acceptable limits (Kline, 1998).

Descriptive statistical analysis was used to determine the participation levels of the items and dimensions comprising the scale. The mean and standard deviation values for participants' variables related to sustainable eating behavior are presented in Table 3.

**Table 3:** Descriptive values related to sustainable and healthy eating behaviors

| Items | $\bar{x}$ | σ |
|---|---|---|
| **Avoiding Food Waste (AFW)** | **4,210** | **,892** |
| 27- I try not to throw away food. | 4,304 | ,952 |
| 26- I don't waste food. | 4,117 | 1,011 |
| **Seasonal Food (SF)** | **4,027** | **1,006** |
| 34- I eat seasonal fruits and vegetables | 4,182 | 1,021 |
| 33- In season, I shop at farmer's market. | 3,872 | 1,243 |
| **Healthy & Balanced Diet (HBD)** | **3,609** | **,863** |
| 1- I choose food that is nutritious | 3,970 | 1,071 |

| Items | $\bar{x}$ | σ |
|---|---|---|
| 2- I choose food that keeps me healthy | 3,907 | 1,078 |
| 4- I choose food that contains a lot of vitamins & minerals. | 3,820 | 1,042 |
| 5- I choose food that contains natural ingredients | 3,798 | 1,100 |
| 7- I try to have a balanced diet. | 3,588 | 1,089 |
| 8- I choose food that contains no artificial ingredients | 3,481 | 1,191 |
| 6- I choose food that contains no additives. | 3,476 | 1,247 |
| 9- I choose whole grains products. | 3,239 | 1,235 |
| 3- I avoid sugary drinks. | 3,024 | 1,401 |
| **Low Fat (LWF)** | **3,372** | **1,071** |
| 25- I avoid food products containing lots of fat. | 3,493 | 1,191 |
| 24- I choose low fat food products. | 3,309 | 1,170 |
| 23- Whenever possible, I choose low fat food products. | 3,314 | 1,177 |
| **Quality Labels (Regional and Organic) (QL)** | **3,210** | **1,064** |
| 13-Whenever possible, I buy organic food. | 3,468 | 1,224 |
| 15- I choose food that is produced in an environmental friendly way. | 3,344 | 1,194 |
| 14- I buy regional food. | 3,169 | 1,290 |
| 12- When buying food, I check certificates and quality marks on labels. | 3,119 | 1,398 |
| 11- I choose food products with a regional certificate. | 2,950 | 1,250 |
| **Animal Welfare (AW)** | **3,179** | **1,026** |
| 29- I choose free-range eggs. | 3,496 | 1,311 |
| 31- Whenever possible, I buy fish from sustainable fishing. | 3,214 | 1,328 |
| 30- I avoid buying battery eggs. | 2,827 | 1,325 |
| **Local Food (LF)** | **2,753** | **1,122** |
| 22- I buy locally produced foods. | 3,301 | 1,253 |
| 21- Whenever possible, I choose fruits and vegetables from my own allotments (plots). | 2,538 | 1,486 |
| 20- I buy fruits and vegetables directly from the farmer. | 2,419 | 1,282 |
| **Meat Reduction (MR)** | **2,553** | **,979** |
| 18-I try to eat as much plant–protein source food products as possible, e.g., pulses. | 3,202 | 1,253 |
| 16- Pulses replace meat in my cooking. | 2,790 | 1,364 |
| 17- I try to eat as many pulses as possible in order to reduce meat consumption. | 2,386 | 1,238 |
| 19- I avoid eating meat. | 1,835 | 1,199 |
| **Total** | **3,321** | **,707** |

When examining Table 3, the overall mean participation in the Sustainable Eating Behavior Scale is found to be 3.321. Among the dimensions of sustainable eating behavior, the highest participation is in the "avoiding food waste" dimension ($\bar{x}$ = 4.210), followed by the "seasonal food" dimension ($\bar{x}$ = 4.027). This suggests that participants are most attentive to preventing food waste within the context of sustainable eating. The dimension with the lowest participation is "meat reduction" ($\bar{x}$ = 2.553), followed by "local food" ($\bar{x}$ = 2.753). These findings indicate that participants are less inclined to reduce meat consumption. When analyzing the scale items, the item with the highest participation is "S27- I try not to throw away food" ($\bar{x}$ = 4.304). This indicates that participants are particularly sensitive about not wasting food. On the other hand, the item with the lowest participation is "S19- I avoid eating meat" ($\bar{x}$ = 1.835), showing that the sample under study values meat consumption and is not keen on reducing it.

Following the descriptive analyses, difference tests were conducted. Difference tests were applied to the dimensions forming the scale based on demographic characteristics. Parametric tests were employed due to the normal distribution of the scale items. A t-test was used to compare two independent groups, and analysis of variance (ANOVA) was used to compare more than two independent groups.

Dimensions where a significant difference was identified are presented in a table, while dimensions where no significant difference was found are described in the text.

First, a difference test was conducted on the Sustainable Eating Behavior Scale based on the gender variable. The analysis revealed that there was no significant difference across any of the dimensions according to gender. Subsequent analyses were conducted based on marital status, and the results are presented in Table 4.

**Table 4:** Differences of sustainable eating behaviors scale according to marital status

| Factors | Marital Status | N | $\bar{x}$ | S.S. | *t* | p |
|---|---|---|---|---|---|---|
| Healthy & Balanced Diet | Single | 232 | 3,331 | ,812 | -8,213 | 0,000 |
| | Married | 169 | 3,399 | ,784 | | |
| Quality Labels | Single | 232 | 2,896 | 1,006 | -7,381 | 0,000 |
| | Married | 169 | 3,641 | ,991 | | |
| Meat Reduction | Single | 232 | 2,379 | ,948 | -4,247 | 0,000 |
| | Married | 169 | 2,792 | ,973 | | |
| Local Food | Single | 232 | 2,528 | 1,067 | -4,779 | 0,000 |
| | Married | 169 | 3,061 | 1,126 | | |
| Low Fat | Single | 232 | 3,212 | 1,057 | -3,552 | 0,000 |
| | Married | 169 | 3,591 | 1,053 | | |
| Seasonal Food | Single | 232 | 3,847 | 1,050 | -4,411 | 0,000 |
| | Married | 169 | 4,275 | ,887 | | |
| Avoiding Food Waste | Single | 232 | 4,081 | ,923 | -3,449 | 0,001 |
| | Married | 169 | 4,387 | ,817 | | |
| Animal Welfare | Single | 232 | 2,998 | ,996 | -4,209 | 0,000 |
| | Married | 169 | 3,428 | 1,017 | | |

The results presented in Table 4 indicate that there are significant differences across all dimensions of the Sustainable Eating Behavior Scale based on marital status. Upon examining these differences, it is noteworthy that married participants show higher participation across all dimensions of the scale compared to single participants. This finding is particularly striking and warrants further investigation and discussion.

Following this, the difference tests were continued with the age variable. The differences among participants based on the age variable were tested using ANOVA analysis. Initially, the Levene statistics were examined, and since the values were greater than 0.5, it was determined that the data was homogeneously distributed.

**Table 5:** Differences of sustainable eating behaviors scale according to age

| Factors | Age | N | $\bar{x}$ | S.S. | *F* | p | Differences |
|---|---|---|---|---|---|---|---|
| Healthy & Balanced Diet | 18-24 (a) | 130 | 3,112 | ,739 | 34,874 | ,000 | a<b, c, d |
| | 25-34 (b) | 143 | 3,636 | ,794 | | | b<c, d |
| | 35-44 (c) | 72 | 4,011 | ,772 | | | c<d |
| | 45+ (d) | 56 | 4,181 | ,781 | | | |
| Quality Labels (Regional and Organic) | 18-24 (a) | 130 | 2,766 | ,984 | 25,862 | ,000 | a<c, d |
| | 25-34 (b) | 143 | 3,078 | 1,041 | | | b<c, d |
| | 35-44 (c) | 72 | 3,788 | ,906 | | | c>a, b |
| | 45+ (d) | 56 | 3,835 | ,870 | | | d>a, b |
| Meat Reduction | 18-24 (a) | 130 | 2,317 | ,927 | 10,438 | ,000 | a<c, d |
| | 25-34 (b) | 143 | 2,433 | ,924 | | | b<c, d |
| | 35-44 (c) | 72 | 2,857 | 1,006 | | | c>a, b |
| | 45+ (d) | 56 | 3,017 | ,963 | | | d>a, b |
| Local Food | 18-24 (a) | 130 | 2,494 | 1,032 | | | a<c, d |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Local Food | 25-34 (b) | 143 | 2,564 | 1,092 | 12,289 | ,000 | b<c, d |
| | 35-44 (c) | 72 | 3,180 | 1,127 | | | c> a, b |
| | 45+ (d) | 56 | 3,285 | 1,077 | | | d>a, b |
| | 18-24 (a) | 130 | 3,053 | 1,044 | | | |
| | 25-34 (b) | 143 | 3,370 | 1,040 | 8,196 | ,000 | |
| Low Fat | 35-44 (c) | 72 | 3,703 | 1,047 | | | a<c, d |
| | 45+ (d) | 56 | 3,690 | 1,042 | | | |
| | 18-24 (a) | 130 | 3,803 | 1,053 | | | |
| Seasonal | 25-34 (b) | 143 | 4,000 | ,996 | 5,260 | ,001 | c>a |
| Food | 35-44 (c) | 72 | 4,333 | ,839 | | | |
| | 45+ (d) | 56 | 4,223 | 1,004 | | | |
| | 18-24 (a) | 130 | 4,011 | ,969 | | | |
| Avoiding | 25-34 (b) | 143 | 4,237 | ,881 | 4,037 | ,008 | c>a |
| Food Waste | 35-44 (c) | 72 | 4,430 | ,693 | | | |
| | 45+ (d) | 56 | 4,321 | ,886 | | | |
| | 18-24 (a) | 130 | 2,851 | ,925 | | | a<c, d |
| Animal | 25-34 (b) | 143 | 3,111 | 1,045 | 12,496 | ,000 | b<c, d |
| Walfare | 35-44 (c) | 72 | 3,546 | ,948 | | | c>a, b |
| | 45+ (d) | 56 | 3,642 | 1,004 | | | d>a, b |

The analysis based on the age variable revealed significant differences across all dimensions of the scale. When examining these differences, it was observed that older participants exhibited higher levels of participation compared to younger participants across all dimensions. Specifically, the 45+ age group demonstrated the highest participation in the Healthy & Balanced Diet, Quality Labels (Regional and Organic), Meat Reduction, Local Food, Animal Welfare, and Low Fat dimensions. Additionally, the 35-44 age group also stood out in the remaining dimensions. This indicates that older individuals are more inclined toward sustainable eating behaviors compared to younger individuals.

**Table 6:** Differences of sustainable eating behaviors scale according to education level

| **Factors** | **Education Level** | **N** | $\bar{x}$ | **S.S.** | ***F*** | **p** | **Differences** |
|---|---|---|---|---|---|---|---|
| Healthy | Primary - High School (a) | 78 | 3,881 | ,973 | | | |
| & | Associate Degree (b) | 67 | 3,407 | ,865 | 4,461 | 0,002 | a>b, c |
| Balanced | Bachelor (c) | 191 | 3,529 | ,838 | | | |
| Diet | Postgraduate (d) | 65 | 3,729 | ,703 | | | |
| Quality | Primary - High School (a) | 78 | 3,546 | 1,174 | | | |
| Labels | Associate Degree (b) | 67 | 3,209 | 1,022 | 3,636 | 0,013 | a>c |
| | Bachelor (c) | 191 | 3,078 | 1,072 | | | |
| | Postgraduate (d) | 65 | 3,196 | ,864 | | | |
| Meat | Primary - High School (a) | 78 | 3,041 | 1,022 | | | |
| Reduction | Associate Degree (b) | 67 | 2,507 | ,780 | 8,636 | 0,000 | a>b, c, d |
| | Bachelor (c) | 191 | 2,416 | ,948 | | | |
| | Postgraduate (d) | 65 | 2,419 | 1,034 | | | |
| Local Food | Primary - High School (a) | 78 | 3,209 | 1,245 | | | |
| | Associate Degree (b) | 67 | 2,900 | 1,013 | Welch's | 0,000 | a>c, d |
| | Bachelor (c) | 191 | 2,589 | 1,106 | F | | |
| | Postgraduate (d) | 65 | 2,533 | ,953 | 6,377 | | |
| | Primary - High School (a) | 78 | 3,534 | 1,119 | Welch's | | |
| Animal | Associate Degree (b) | 67 | 3,238 | ,862 | F | 0,008 | a>c |
| Welfare | Bachelor (c) | 191 | 3,020 | 1,060 | 4,116 | | |
| | Postgraduate (d) | 65 | 3,159 | ,860 | | | |

Table 6 shows the differences in the scale according to educational level. No significant differences were found in the Low Fat, Seasonal Food, and Avoiding Food Waste dimensions. However, in the dimensions where differences were detected (Healthy & Balanced Diet, Quality Labels (Regional and

Organic), Meat Reduction, Local Food, Animal Welfare), individuals with lower educational levels showed higher participation in sustainable eating compared to those with higher educational levels. Specifically, people with Primary to High School education levels appear to be more inclined towards sustainable eating behaviors than those with higher educational backgrounds.

**Table 7:** Differences of sustainable eating behaviors scale according to monthly income

| **Factors** | Monthly Income(TL) | **N** | $\bar{x}$ | **S.S.** | ***F*** | **p** | **Differences** |
|---|---|---|---|---|---|---|---|
| Healthy & Balanced Diet | Less than 8500 (a) | 112 | 3,237 | ,882 | Welch's F 13,662 | 0,000 | a<b, d, e<br>b>c<br>e>a, c |
| | 8501-11500 (b) | 34 | 3,903 | ,711 | | | |
| | 11501-15000 (c) | 72 | 3,430 | ,837 | | | |
| | 15001-25000 (d) | 58 | 3,647 | ,898 | | | |
| | More than 25000 (e) | 125 | 3,949 | ,718 | | | |
| Quality Labels | Less than 8500 (a) | 112 | 2,850 | 1,092 | 7,416 | 0,000 | a<b, d, e<br>e>a, c |
| | 8501-11500 (b) | 34 | 3,517 | 1,043 | | | |
| | 11501-15000 (c) | 72 | 3,011 | 1,049 | | | |
| | 15001-25000 (d) | 58 | 3,396 | ,901 | | | |
| | More than 25000 (e) | 125 | 3,478 | 1,020 | | | |
| Local Food | Less than 8500 (a) | 112 | 2,494 | 1,087 | 3,110 | 0,015 | a<b |
| | 8501-11500 (b) | 34 | 3,196 | 1,107 | | | |
| | 11501-15000 (c) | 72 | 2,745 | 1,167 | | | |
| | 15001-25000 (d) | 58 | 2,827 | 1,139 | | | |
| | More than 25000 (e) | 125 | 2,834 | 1,084 | | | |
| Animal Welfare | Less than 8500 (a) | 112 | 2,827 | 1,055 | 6,026 | 0,000 | a<b, d, e |
| | 8501-11500 (b) | 34 | 3,480 | 1,051 | | | |
| | 11501-15000 (c) | 72 | 3,106 | ,952 | | | |
| | 15001-25000 (d) | 58 | 3,431 | ,898 | | | |
| | More than 25000 (e) | 125 | 3,338 | 1,010 | | | |

The differences according to monthly income are presented in Table 7. No significant differences were found in the Meat Reduction, Low Fat Seasonal Food, and Avoiding Food Waste dimensions. However, in the dimensions where differences were detected (Healthy & Balanced Diet, Quality Labels (Regional and Organic), Local Food, Animal Welfare), it was observed that higher income groups were more inclined toward sustainable eating compared to lower income groups. Participants with a monthly income of 8500 TL or less showed lower participation in sustainable eating behaviors. It can be inferred that a decrease in monthly income negatively impacts sustainable eating behavior.

**Results and recommendations**

One of the key application areas of the sustainability philosophy is gastronomy, which is among the leading fields in this regard. For a sustainable gastronomy approach to be established, there must be a demand for sustainable nutrition. In this context, the role of sustainable eating behavior is significant, and understanding its dynamics is crucial. This study, conducted within the context of sustainable eating tendencies, provides important insights. The study, carried out in Safranbolu, involved 401 participants, analyzing their tendencies towards sustainable eating and differences based on demographic characteristics.

When examining the results, it is evident that the overall tendency towards the Sustainable Eating Behavior Scale is not particularly high. It can be inferred that the awareness of sustainable eating within this sample is not well-developed. Among the dimensions of the scale, the least participation was observed in the meat reduction dimension. Similarly, in a study conducted by Bayram et al. (2023), this dimension also had the lowest participation. The intensive production of animals for meat consumption causes significant harm to the planet, and maintaining meat consumption at an optimal level is critical for sustainability (Machovina et al., 2015). Additionally, it is important to consider and discuss food technologies such as cultured meat and cellular meat as alternatives. Another dimension with low participation was the local food dimension. In a study conducted by Yeşildemir (2023), the dimension

with the lowest frequency was also local food. It is important to prioritize local food consumption to support the local economy, community, and production. Awareness-raising efforts in this area are essential.

Among the scale dimensions, the highest participation was observed in the avoiding food waste dimension. In a study conducted by Yolcuoğlu and Kızıltan (2021), avoiding food waste was also the dimension with the highest participation. This is a positive outcome, as every piece of wasted food also represents wasted resources (such as the costs associated with growing, transporting, and processing the food) (Süzer, 2023). Minimizing food waste is critical for achieving sustainability in general and sustainable gastronomy in particular. Similarly, the seasonal food dimension also had high participation. In the study by Kocaadam Bozkurt and Bozkurt (2023), the seasonal food dimension was also one of the highly participated dimensions. Choosing seasonal foods helps prevent unnecessary ecological damage, making it important to increase awareness in this area.

When examining the scale dimensions in relation to demographic characteristics, there were no differences in any dimension based on gender. In a study conducted by Mortaş et al. (2023) using the same scale, no significant gender differences were found across the scale dimensions. However, when examining marital status, it was found that married individuals had higher participation in all dimensions compared to single individuals. This is a noteworthy finding, suggesting that marriage may contribute to the development of sustainable eating awareness. Regarding age, significant differences were observed across all dimensions of the scale. The most prominent difference observed was that older individuals tended to have more sustainable eating habits compared to younger individuals. Specifically, individuals in the 18-24 age group were less inclined towards sustainable eating in all dimensions compared to older age groups.

These findings highlight the need for targeted interventions to promote sustainable eating habits, particularly among younger and less educated populations. Increasing awareness and education on the importance of reducing meat consumption, supporting local food systems, and minimizing food waste are crucial steps toward building a more sustainable gastronomy.

When examined based on educational level, significant differences were found in five dimensions (Healthy & Balanced Diet, Quality Labels (Regional and Organic), Meat Reduction, Local Food and Animal Welfare). A noteworthy finding in this regard is that participants with lower educational levels were more inclined toward sustainable eating. The findings suggest that an increase in education level does not necessarily enhance the perception of sustainable nutrition. Regarding the final demographic variable, monthly income, significant differences were identified in four dimensions (Healthy & Balanced Diet, Quality Labels (Regional and Organic), Local Food and Animal Welfare). Upon examining these differences, it was observed that participants with lower income levels also exhibited lower tendencies towards sustainable eating. An increase in income level appears to correspond with a greater awareness of sustainable nutrition.

This study provides valuable insights by analyzing sustainable eating tendencies in Safranbolu. The results indicate that participants generally do not have a high inclination towards sustainable eating. Notably, there are low levels of participation in areas such as reducing meat consumption and consuming local foods. However, the participants' awareness of preventing food waste is a positive finding. Demographic analyses reveal that older individuals and married participants tend to have more sustainable eating habits. In this context, it is recommended that educational and awareness campaigns targeting younger populations be intensified to increase awareness of sustainable nutrition. Future studies could explore similar analyses in different regions to assess the generalizability of the results and develop broader strategies to promote sustainable eating tendencies. Some limitations of this study include the use of a single sample, cross-sectional data collection, reliance solely on quantitative methods, and the use of convenience sampling.

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**Ethical approval**

This study has been approved by the Social Sciences and Humanities ethic committee of Karabuk University with 305406 number and 26.01.2024 date.

**Conflict of interest**

There is no potential conflict of interest in this study.

**Support information / Thanks**

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**Appandix A:** First Order CFA Model of Sustainable and Healthy Eating Behavior Scale