

## Food Demand and Nutritional Habits of Consumers During the Covid-19 Outbreak: A Case Study in Türkiye

Türkiye'de Covid-19 Salgını Sırasında Tüketicilerin Gıda Talebi ve Beslenme Alışkanlıkları: Bir Örnek Çalışma

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### Abstract

The Covid-19 pandemic, which has affected the entire world, has caused changes in many areas of life worldwide. These changes have also influenced and continue to influence consumer behaviors. During the restrictions, people staying at home and only going out for essential needs such as grocery shopping has caused changes in their shopping and consumption habits. The changing consumer behaviors related to the process have brought about many studies. Since the outbreak of Covid-19, it has caused significant changes in the attitudes and behaviors of individuals in the world and in Türkiye. Numerous studies have been conducted to understand these changes. The purpose of this study is to examine the effects of the pandemic on the food demand and nutritional habits of individuals residing in Tekirdağ province. To achieve this, a survey was conducted with consumers living in Tekirdağ. According to the research's predicted 10% margin of error and 99% significance level, the sample size was calculated to be 166 people. Factor analysis was applied during the statistical analysis of the findings. Based on the results of the factor analysis, it was found that the desire of individuals to consume organic products and their awareness of healthy nutrition were high. The negative conditions that occurred during the pandemic increased the desire of individuals to eat. It has shown that consumers are more sensitive about healthy eating during the Covid-19 pandemic process. An increase in the consumption of food products that form the basis of a healthy diet, such as fruits, vegetables and eggs, and a corresponding decrease in the consumption of carbonated drinks and prepackaged food also support this finding. However, the high increase in the consumption of pastries and nuts can be given as examples of the negative effects of the need to stay at home and the restriction of physical activities due to the Covid-19 outbreak. In addition, their buying behavior changed, and the number of people who procure food products through online shopping increased. The aim of this study is to inform consumers and researchers working on this subject about how food consumption of consumers has changed after Covid-19.

**Key Words:** Covid-19 Outbreak, Nutrition habits, Food demand, Consumption of agricultural products, Purchasing behavior

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## Öz

Covid-19 pandemisi, tüm dünyayı etkisi altına almış ve dünya genelinde birçok alanda değişikliklere neden olmuştur. Bu değişiklikler tüketici davranışlarını da etkilemiş ve etkilemeye de devam etmektedir. Kısıtlamalar sırasında, insanların evde kalmaları ve sadece gıda alışverişi gibi zorunlu ihtiyaçları için sokağa çıkmaları, alışveriş ve tüketim alışkanlıklarında değişiklikler meydana getirmiştir. Süreç ile ilgili değişen tüketici davranışları pek çok araştırmayı da beraberinde getirmiştir. Covid-19 salgınının ortaya çıkması, dünya genelinde ve Türkiye'de bireylerin tutum ve davranışlarında önemli değişikliklere neden olmuştur. Bu değişiklikleri belirlemek için birçok çalışma yapılmıştır. Bu çalışmanın amacı, Tekirdağ ilinde yaşayan bireylerin gıda talebi ve beslenme alışkanlıkları üzerindeki pandeminin etkilerini incelemektir. Bunun için, Tekirdağ'da yaşayan tüketicilerle bir anket yapılmıştır. Örnek hacmi oransal örnekleme yöntemi ile %99 güven aralığı ve %10 hata payı esas alınarak 166 kişi olarak belirlenmiştir. Bulguların istatistiksel analizi sırasında faktör analizi uygulanmıştır. Faktör analizi sonuçlarına göre, bireylerin organik ürün tüketme isteklerinin ve sağlıklı beslenme konusundaki farkındalıklarının yüksek olduğu bulunmuştur. Salgın döneminde ortaya çıkan olumsuz koşullar, bireylerin yeme isteklerini artırmıştır. Covid-19 pandemisi sürecinde tüketicilerin sağlıklı beslenme konusunda daha duyarlı davrandığı görülmüştür. Meyve, sebze ve yumurta gibi sağlıklı beslenmenin temelini oluşturan gıda ürünlerinin tüketiminde artış olurken buna bağlı olarak gazlı içecekler ve hazır ambalajlı gıda tüketimindeki azalma da bu bulguyu desteklemektedir. Bununla birlikte, hamur işleri ile kuruyemiş tüketimindeki yüksek artış, Covid-19 salgını nedeniyle evde kalma gerekliliğinin ve fiziksel aktivitelerin kısıtlanmasının olumsuz etkilerine örnek olarak gösterilebilir. Ayrıca, satın alma davranışlarını değiştirmiş ve gıda ürünlerini online alışveriş yoluyla temin eden insan sayısı artmıştır. Bu çalışmanın amacı, Covid-19'dan sonra tüketicilerin gıda tüketiminde nasıl değişiklikler yaşadığını belirleyerek tüketicileri bilgilendirmektir.

**Anahtar Kelimeler:** Covid-19 salgını, Beslenme alışkanlıkları, Gıda talebi, Tarım ürünleri tüketimi, Satın alma davranışı

## **1. Introduction**

Pandemics have adversely affected human health throughout human history. It also caused many changes in social life. With the changes, governments have taken serious measures both to combat the outbreak and to meet the needs of citizens. The term pandemic is formed by the combination of the ancient Greek words pan (all) and demos (people). The first pandemic in the literature in history was the Typhus Pandemic between 429-426 BC (Akin, 2018).

The Novel Coronavirus Disease (COVID-19), which is effective today, was first diagnosed on January 13, 2020, in a group of patients who developed respiratory symptoms (fever, cough, shortness of breath) on December 31, 2019, in Wuhan, China. It was defined as a global epidemic (pandemic) by the World Health Organization on March 11, 2020, due to the spread and severity of the virus. Since then, it has caused 505.817.953 cases and 6.213.876 deaths worldwide (WHO, 2022). In Türkiye, since 11th March 2020, when the first case was announced, it has caused a total of 15.010.718 cases and a total of 98.645 deaths (WHO, 2022).

Besides being a basic need, nutrition also has an important effect on a healthy life. It is known that people who follow quality and a healthy diet have a lower risk of death to various chronic diseases or different causes (Mötteli et al., 2016). As with any disease, the best approach for Covid-19 is prevention. Nutritional deficiencies that weaken the immune system can lead to increased susceptibility to infectious diseases (Khayyatzadeh, 2020). Therefore, people should pay attention to their dietary habits to reduce the sensitivity and long-term complications caused by Covid-19.

Adequate intake of nutrients is necessary for a healthy diet. Diversity is as important as the level of nutrient intake. In addition to being delicious, fruits and vegetables are important for sustainable health with the vitamins and minerals they contain (Menezes et al., 2018; Huitink et al., 2020). In addition, protein sources such as meat, poultry, eggs, fish and dairy products are important for sustainable health as they contain essential amino acids that support growth and development, and it is recommended to be consumed regularly (Prévost et al., 2010; Yılmaz et al., 2009).

Muscogiuri et al. (2020) state that to reduce the spread of the virus, people living under quarantine may consume more food than boredom and stress. In addition, during this period, it is recommended to consume healthy foods containing minerals, antioxidants and vitamins, to ensure a balanced diet, to pay attention to nutritional habits, and to consume fruits and vegetables to strengthen immunity. However, many studies show that there is a positive relationship between individuals' nutritional knowledge and healthy food choices (Wardle et al., 2000; Klohe-Lehman et al., 2006; Cavaliere et al., 2015; Fenko et al., 2015). In addition, healthy nutrition has gained importance in industrialized Western Countries as well as in other countries and ordinary people (Moraes Prata Gaspar et al, 2020). It should not be forgotten that there are many components that affect people's eating habits and preferences in special situations such as the Covid-19 pandemic, but in such cases, healthy nutrition becomes even more important.

Since the pandemic creates different effects in every sector, different studies are carried out in many branches of science and the change it creates, its results and the effects it will create in the future are tried to be revealed in different fields. For example, Ceylan et al. (2021), in their research, on the changes in the financial situation of consumers during the Covid-19 pandemic in Türkiye, changes in their total revenue, purchasing methods and their consequences, shed light on the future by revealing the share of purchases of agricultural food products in total income, changes in total incomes, purchasing methods and results. Tonsor et al. (2021) on the other hand, revealed the changes in meat consumption demand in the USA during the Covid-19 outbreak and the reasons for this change with the data of the previous year. Ghali-Zinoubi (2021), in his study, investigated the changes and causes in food consumption during the Covid-19 outbreak in Saudi Arabia and found that the primary reason why consumers increase their consumption of local products is healthy eating. Smith and Wesselbaum (2020), in their study named COVID-19, Food Insecurity and Migration; stated that the epidemic had a significant impact especially on the food and agriculture sector. In this period, it has been understood that agriculture is very important for the future in terms of food safety and risk management (Aday and Aday, 2020; Pressman et al., 2020;). It is also known that the COVID-19 pandemic has positive effects on environmental awareness, sustainable consumption and social responsibility (Severo et al., 2020). This study also revealed the changes in food consumption during the Covid-

19 pandemic, as in the examples. When these regional studies are compiled later, by providing induction, they will shed light on the changes and possible results in all of Türkiye and even in the world.

## 2. Materials and Methods

The primary data of the research consists of survey studies conducted with people living in Tekirdağ. Secondary data consists of domestic and foreign academic studies and another research that has been done before on the subject.

In the survey phase of the study, trial questionnaires were prepared in order to determine the sufficient sample volume for the study and to eliminate the deficiencies of the questionnaire to be applied. These prepared surveys were applied to randomly selected families. Based on the results obtained from the pioneering surveys, the survey forms were reviewed, arrangements were made and surveys were conducted through face-to-face interviews.

According to the 99% significance level and 10% margin of error predicted for the research, the number of samples (n) to be surveyed was calculated as 166 people. In the analysis of the data, the data of this number of people were used.

After the data obtained from the research were entered into the SPSS, data control was performed. The frequencies and percentages of categorical variables were taken. Whether the data were normally distributed or not, Kolmogorov-Smirnov and Shapiro-Wilk analyzes were used in the compatibility tests, and then the relations between the variables were examined using factor analysis.

## 3. Results and Discussion

In order to get information about the demographic structures of the consumers who participated in the survey the research, questions about demographic characteristics were asked in the last part of the survey form. 51.2% of the consumers participating in the survey are women and 48.8% are men. In Table 1, the demographic characteristics of the people who participated in the survey are given in all detail. The point that draws attention here is that the monthly income level of 67.9% of the participants is above 5000 TRY and the food expenditures of 54.3% are between 1500-3000 TRY. This shows us that almost half of the monthly income of the respondents is allocated for food expenditures.

People allocate a share of their total income for nutrition. During the Covid-19 period, while the demand for products of animal origin increased, the share allocated for these products in the total income also increased (Ceylan et al., 2021). In the first part of the survey, respondents were asked whether there was any change in their income levels, food expenditures and the number of daily meals during the Covid-19 pandemic, and the findings obtained in Table 2 are given. 74.7% of the consumers who participated in the survey stated that there was no change in their income levels. 78.9% of the people who participated in the survey stated that their food expenditures increased during the pandemic period. Based on this finding, it is possible to say that the share of food products expenditure in total income has also increased. 60.3% of the participants stated that there was no change in the number of daily meals during the pandemic period.

Participants were asked whether they used food supplements before and during the outbreak. While 25.9% of the participants stated that they used food supplements before the pandemic, 74.1% stated that they did not. The rate of participants using food supplements during the Covid-19 period increased to 59.9%.

Consumers were asked whether they read the label information of packaged products before and after the outbreak. While 86.7% of the participants stated that they read the information about the product content before the pandemic period, 13.3% stated that they did not. While 87.3% of the participants stated that they read the product contents during the outbreak period, 12.7% stated that they did not. The majority of the participants in the study stated that they read the product information because they were careful about their health. Some of the participants stated that they prefer foods that will strengthen the immune system, so they read the information about the content of the products during their shopping. In addition, some of the consumers stated that they stopped buying products with heavy additives and harmful content by looking at the product information. Consumers who read the product content information before the outbreak but did not read it during the pandemic, the reason for this change; stated that they do not touch the products and buy the products they touch in order not to increase the risk of transmission of the disease.

**Table 1. Demographic Characteristics of the Consumers Participating in the Survey**

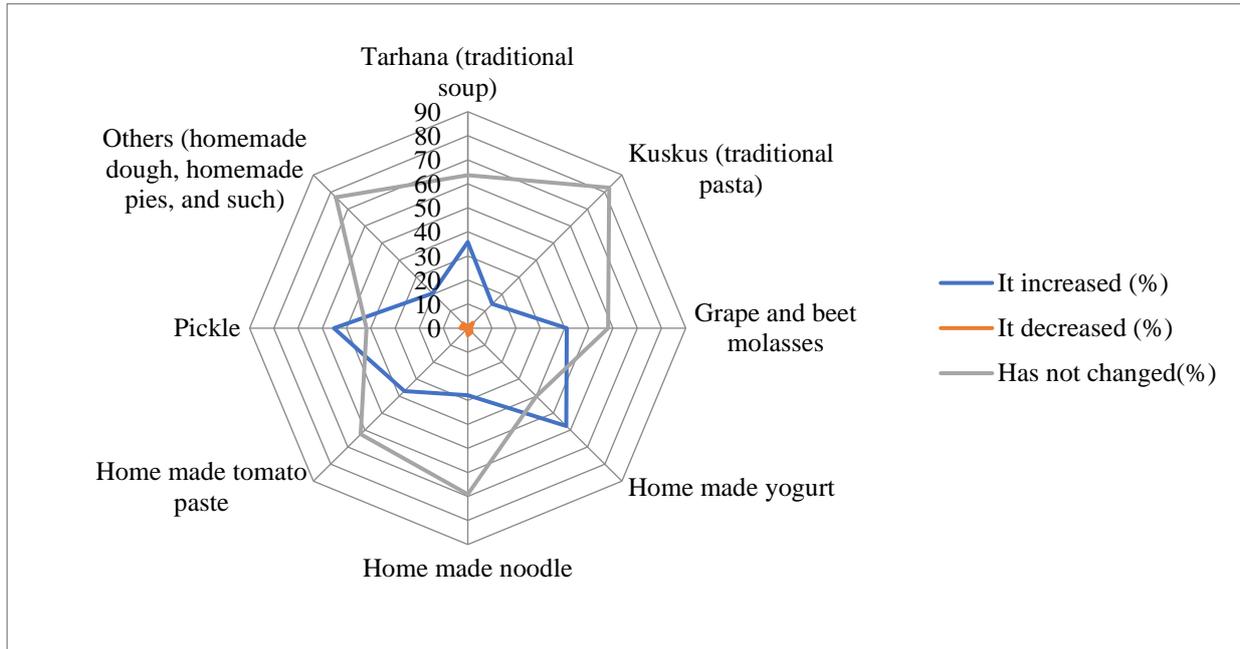
Age Groups	Number	Rate (%)	Working Place	Number	Rate (%)
18-25	14	8.4	Public Sector	89	53.6
26-40	90	54.2	Private Sector	44	26.5
41-55	57	34.3	Own Business	9	5.4
56 years and older	5	3.1	Retired	6	3.6
<b>Gender</b>			Unemployed	11	6.6
Woman	85	51.2	Student	7	4.3
Man	81	48.8	<b>Social Security</b>		
<b>Marital Status</b>			Social Security Institution	157	94.6
Married	120	72.3	Other	6	3.6
Single	34	20.5	Without Social Security	3	1.8
Wife or Husband Passed Away	2	1.2	<b>Monthly Income Level (TRY)</b>		
Divorced	10	6	Less than 1500 TRY	2	1.2
<b>Education Status</b>			1501-3000	20	12.1
Primary School	6	3.6	3001-5000	31	18.8
Secondary School	4	2.4	5001-7000	47	27.9
High School	30	18.1	7001 TRY and Above	66	40
Associate Degree	19	11.4	<b>Total Food Expenditure Per Month (TRY)</b>		
University	80	48.2	Less than 1500 TRY	37	22.6
Postgraduate	27	16.3	1501-3000	89	54.3
<b>Who Does the Grocery Shopping in Your Family?</b>			3001-5000	31	18.3
Myself	53	31.9	5001 TRY and above	9	4.8
Wife or Husband	12	7.2			
With my Wife or my Husband	84	50.6			
Other	17	10.3			

**Table 2. Change in Income Level, Food Expenditures and Number of Meals**

	Increased (%)	Decreased (%)	Not Changed (%)
Change in Income Level in the Covid-19 Pandemic	6.0	19.3	74.7
Change in Food Spending During the Covid-19 Outbreak	78.9	3.6	17.5
Change in Number of Daily Meals During the Covid-19 Outbreak	28.9	10.8	60.3

In recent years, consumers' interest in local food has significantly increased and many studies have been carried out on this subject in the field of agricultural economics (Aprile et al., 2016; Arsil et al., 2018). The reason for the increased consumption of local products during the Covid-19 pandemic is related to the awareness of healthy eating (Ghali-Zinoubi, 2021). It is known that consumer awareness has increased due to covid 19 and they have increased their consumption of local products due to food safety concerns (Ben Hassen et al., 2020). With the understanding of food sustainability, businesses include local food products in their menus (Ozturk and Akoglu, 2020). It is thought that local foods are as effective as the quality of the products in consumers' purchase of domestic products (Oraman et al., 2011; Memery et al., 2015). In addition, some studies on local food show that it is important for consumers to have practical and taste, freshness, appearance, availability and health benefits of local foods in their buying decisions (Skallerud and Wien, 2019). It should not be forgotten that consuming local foods will also reduce environmental impacts (Peterson, 2013). When we asked the surveyed consumers whether they found traditional, homemade products important for a healthy diet, 94.6% of the respondents thought that

these products were important for a healthy diet, while 5.4% did not think that they were important. The surveyed consumers increased their consumption of homemade yogurt and pickles during the pandemic period (Figure 1). Ozdemir et al. (2017) results are similar to our results.



**Figure 1. Traditional Product Consumption During the Covid-19 Outbreak**

In the Covid -19 outbreak, the issue that many experts focused on was the immune system. For example; Acar and Koçak (2020), in their article named "The Role of Nutrition in Supporting the Immune System in the Fight Against Coronavirus (Covid-19)", revealed that there is a strong and complex link between the immune system and nutrition, and detailed the effects of each nutrient and vitamin on the immune system. Many academic studies have also attracted the attention of people by taking place in the visual and written media. Based on scientific research and the news in the press that spices and dry foods will also be effective in strengthening the immune system, we asked the participants in our survey, "Do you think spices and dried herbs are effective in strengthening the immune system?" they asked. While 65.7% of the participants answered yes, 8.4% answered no. 25.9% of the participants answered that they have no idea.

The consumers who participated in the survey were asked about their opinions about bee products for healthy nutrition and strengthening the immune system. 86.7% answered yes, 1.2% answered no, and 12% answered no idea. Compared to the pre-pandemic period, the rate of those who did not consume any honey increased by 11.5% during the outbreak, the rates of those who never consumed pollen increased by 12%, the rates of those who never consumed propolis increased by 24.1% and the rates of those who did not consume royal jelly decreased by 20%. This shows that those who did not consume these products before the pandemic period started to consume these products to strengthen their immune systems during the pandemic period. Because about 87% of consumers stated that they find bee products important in a healthy diet. Propolis has antiviral, antibacterial and antifungal effects. It is a natural medicine because it contains 22 nutrients that must be taken by the body for health (Kumova et al., 2002). Therefore, it is not a coincidence to observe an increase in the rate of those who use bee products especially once a day and 2-3 times a week (Figure 2).

It is known that consumers have changed their behavior due to Covid -19 health and economic fears (Eger et al., 2021). In addition to many changes in social life during the Covid-19 pandemic, it was determined in the research that 67% of consumers also changed the places where they sourced food products. The consumers participating in the survey were asked about the reasons for the change in the places where they shop for food. 72% of consumers who changed their food supply during the epidemic stated that they changed it because it was the closest distance to their house, and 67% said that they changed it because there was a curfew. The least reason for the change is those who change prices because they are cheaper than other places (33.6%). In this period, we

can say that consumers do not pay much attention to the prices of products in order to protect their health (Figure 3).

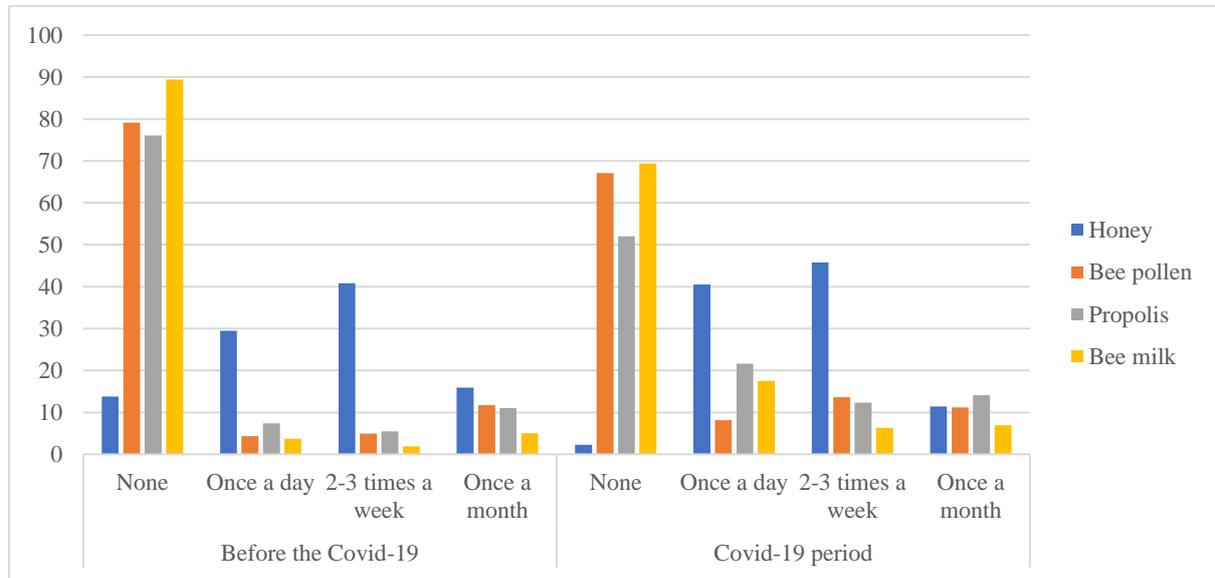


Figure 2. Changes in Bee Products Consumption Before and During the Covid-19 Outbreak

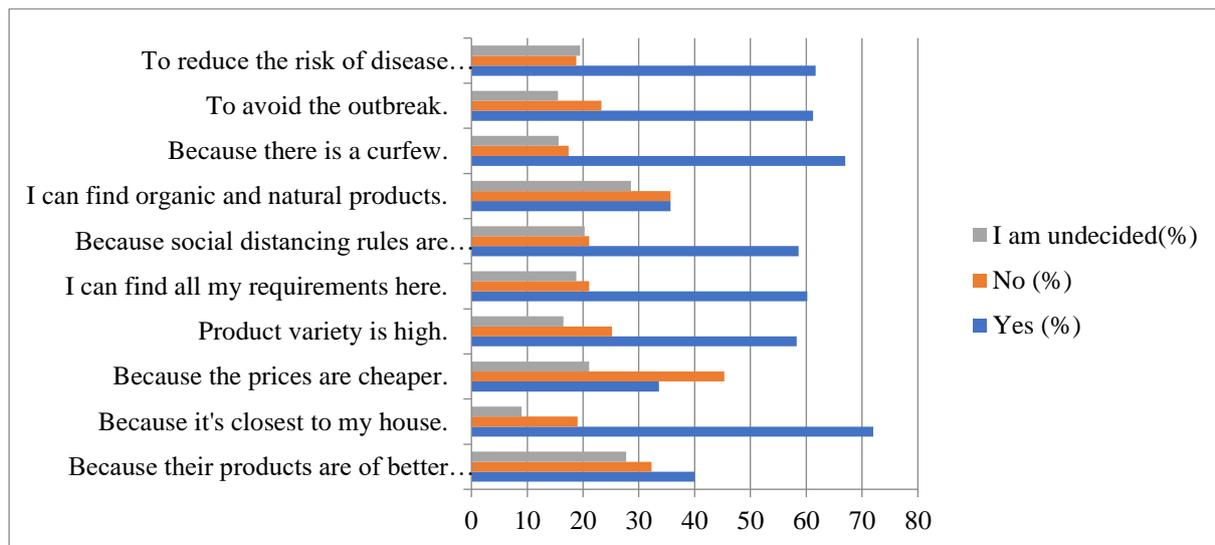


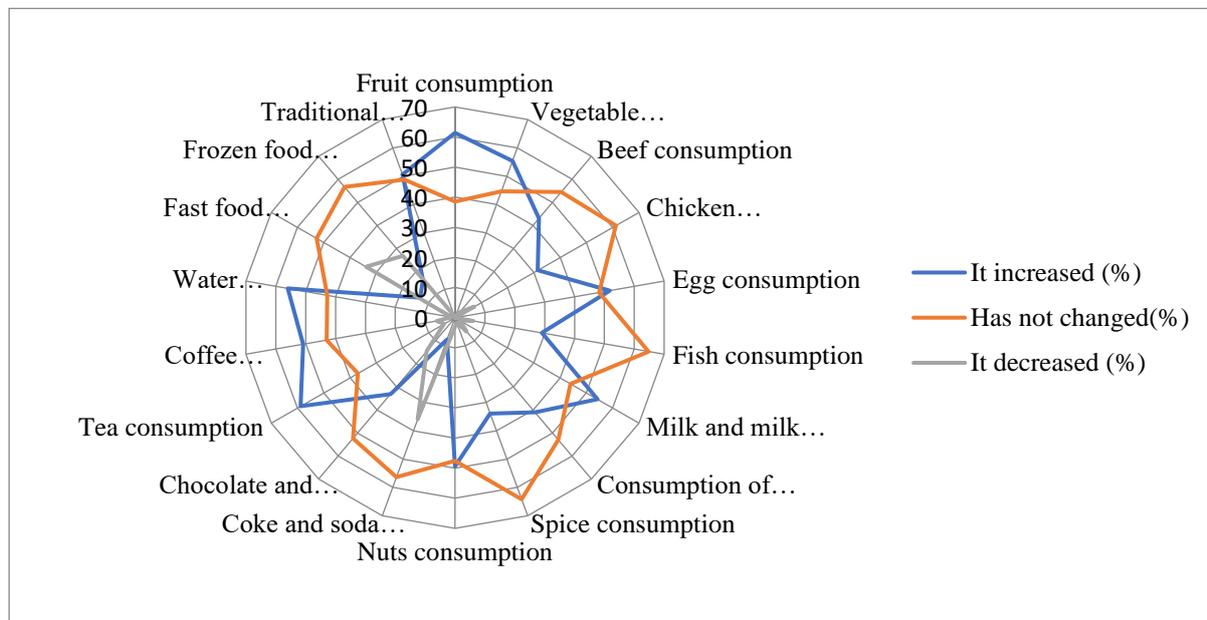
Figure 3. Reasons for Changes in Where Consumers Supply Food During the Covid-19 Outbreak

Before Covid-19, people were affected by different factors when buying food. It is known that with Covid-19, people develop "panic buying behavior" by being affected by different situations and people. Panic buying behavior can create positive or negative externalities for consumers (Yuen et al., 2020). It was asked which factors are affected by consumers while shopping for food. While approximately 57% of the consumers stated that they were not influenced by anyone in their food shopping, approximately 21% stated that they were influenced by their families, 9% by their friends, 5% by social media, 3% by TV advertisements, and 1% by their colleagues. 4% of consumers marked the "other" option and stated that they were influenced by professional groups such as doctors and dietitians. In addition, 93% of the consumers participating in the survey have an internet connection at home, while the rate of online food shopping is 29%.

Due to the Covid-19 outbreak, a significant part of the population met virtual shopping for the first time in their lives. This new experience is very likely to become a permanent habit (Sheth, 2020). Direct sales from the farm are much more efficient and also take an environmentally friendly approach (Loiseau et al., 2020; Rizou et al, 2020). The COVID-19 pandemic has caused several disruptions that businesses need to adapt to in the short

and medium term (Pantano et al., 2020). For this reason, company executives need to pay attention to emerging e-commerce trends (Gurbuz and Ozkan, 2020). E-commerce can present a serious business opportunity for any organization, large or small, in the emerging technology society. In addition, a well-designed website will make it easier to reach organic products (Mozas-Moral et al., 2016). The Covid-19 crisis has strained the food supply and small farms have been hit hardest. It should be taken into account that these negative effects of the Covid-19 pandemic will continue for a long time. Moreover, a new production, processing and marketing model for food products should be developed (Koussani and Khamassi, 2022). Social marketing in e-commerce brings the producer and the consumer direct into the food market. Communicating direct with customers creates an opportunity for agricultural businesses. Shortening the supply chain can lead to fresher purchases and better price transfer (Elghannam and Mesias, 2019). For this reason, these marketing models that will shape the future should be well analyzed and their effective use should be expanded.

Bacteria in milk and dairy products strengthen the immune system and its consumption gives positive results against various diseases (Ouwehand and Salminen, 1998). Spices, on the other hand, are curative for some diseases, but they are not enough alone (Bousquet et al., 2020). When the consumers participating in the survey were asked how their food consumption changed, they stated that their consumption of fruit, vegetables, milk and dairy products, eggs, water, coffee, tea, nuts increased, and their consumption of carbonated drinks, packaged ready-made foods and frozen food decreased (Figure 4).



**Figure 4. Changes in Food Consumption During the Covid-19 Outbreak**

Factor analysis was also applied to understand whether 22 judgments given to examine the changes in food demands and dietary habits of consumers during the Covid-19 pandemic were gathered under certain factors. Before starting the factor analysis, reliability analysis was performed to determine whether the data were consistent within themselves (Nakip, 2003). The reliability coefficient (Cronbach-Alpha) was determined as 0.909. According to this criterion, the scale is reliable.

Kaiser-Meyer-Olkin measurement was used to determine whether the variables to be used were suitable for factor analysis. The KMO test result was calculated as 0.859. The KMO value was accepted as very good at 0.90 and as good at 0.80 (Joseph et al., 1992; Emeksiz et al., 2002), with the assumption that the KMO test value of 0.859 was obtained in the study was evaluated as ideal. In addition, Barlett's Test of Sphericity value and significance tests whether the variables are correlated with each other and is a value that shows whether it is appropriate to perform factor analysis with the data used.

Consumers have been given expressions regarding the period of the Covid-19 outbreak. For these expressions, the consumers chose the most appropriate expression for them from the five-point Likert scale of "strongly agree", "agree", "undecided", "disagree" and "strongly disagree". According to the factor analysis applied, 58.598% of 22

expressions regarding the nutrition and consumption demands of consumers during the Covid-19 outbreak period are explained by 4 factors (Table 2).

**Table 3. Results of Factor Analysis**

Factors and the variables that make up factor	Variance (%)	Core Values
<b>Factor 1 Organic goods and awareness</b>	32.971	5.277
Consuming organic goods guards me against illnesses.	.811	
Consumption of organic goods should be increased.	.773	
Advised goods from nutritionists should be consumed.	.678	
Consuming traditional food goods strengthens our immune system.	.671	
I've been more careful with food sanitation during the Covid-19,	.554	
I accept to pay more for organic goods rather than other goods	.461	
<b>Factor 2 Psychological effects and changes</b>	13.345	3.909
Gained more weight during the pandemic,	.808	
Pastries have been consumed more during the Covid-19 pandemic,	.765	
Illness's spread and anxiety during the pandemic affected dietary habits negatively,	.762	
Staying home during the pandemic increased eating desire,	.755	
Changes in dietary habits also changed sleeping habits	.698	
During pandemic, Diet should be according to nutritionist suggestions.	.474	
<b>Factor 3 Changes in consumer preferences and habits</b>	6.543	2.542
I've purchased food goods online during the pandemic,	.654	
Health programs on media had effects on my diet during the pandemic.	.535	
I've consumed herbal teas more during the pandemic	.500	
<b>Factor 4 Conscious consumption</b>	5.741	4.873
Negative posts on social media about food resulted in changes of purchasing habits of people,	.728	
I've given more importance to a healthier diet,	.663	
I've consumed goods that would strengthen my immune system,	.569	
My spending on food goods has increased	.559	
I've increased consuming herbs etc. to protect from the virus during the pandemic,	.533	
There is an increase in consumption of home-made traditional goods	.526	
Consumers' awareness of healthy diet should be increased	.464	

KMO. 0.859. Barlett's test: 0.909;  $p < 0.000$

**Factor 1: Organic goods and awareness:** Consuming organic goods guards me against illnesses, Consumption of organic goods should be increased, Advice goods from nutritionists should be consumed, Consuming traditional food goods strengthens our immune system, and I've been more careful about food sanitation during Covid-19, I accept to pay more to organic goods rather than other goods, creates one group and accepted as one factor. Factor 1 has been named "Organic goods and awareness" and explains variance by 32.971%.

**Factor 2: Psychological effects and changes:** Gained more weight during pandemic, Pastries have been consumed more during Covid-19 pandemic, Illness's spread and anxiety during pandemic affected dietary habit negatively, Staying home during pandemic increased eating desire, Changes in dietary habits also changed sleeping habits during pandemic, Diet should be according to nutritionist suggestions creates one group and accepted as one factor Factor 2 has named as "Psychological effects and changes and explains variance by 13.345%.

**Factor 3: Changes in consumer preferences and habits:** I've purchased food goods online during pandemic, Health programs on media had effects on my diet during pandemic, and I consumed herbal teas more during

pandemic creating one group and accepted as one factor. Factor 3 has been named "Changes in consumer preferences and habits" and explains variance by 6.453%. Yılmaz et al. (2007) it has been concluded that the people living in Tekirdağ province are highly influenced by advertisements in the consumption of foodstuffs. These results are similar to the results we determined.

**Factor 4: Conscious consumption:** Negative posts on social media about food resulted in changes in purchasing habits of people, I've given more importance to a more healthy diet, and I've consumed goods that would strengthen my immune system, My spending on food goods has increased, I've increased consuming herbs, etc. in order to protect from the virus during pandemic, There is an increase in consumption of home-made traditional goods, Consumers' awareness on the healthy diet should be increased creates one group and accepted as one factor. Factor 4 has been named "Conscious consumption" and explains variance by 5.741%.

#### 4. Conclusions

The COVID-19 pandemic has had far-reaching impacts on individuals and communities around the world, including changes in dietary habits and food demands. This study aimed to assess these changes in the Tekirdağ population in Türkiye. The results of the study indicated that the pandemic had similar impacts on both men and women, with no gender differences observed in changes to dietary habits.

The study found that consumers in Tekirdağ allocated a substantial proportion of their monthly income for food spending, with those with two or more children setting aside nearly half of their income for this purpose. Despite the fact that 75% of consumers' income remained unchanged, 79% of food spendings increased, highlighting the impact of the pandemic on consumer behavior and priorities. Additionally, the study showed that there was an increase in the purchase of food supplements, reflecting the emphasis placed on boosting immunity during the pandemic. The proportion of consumers taking food supplements rose from approximately 26% prior to the pandemic to 60% during the pandemic, and 31% of those using food supplements before the pandemic increased their intake during the pandemic period. This increase in demand for food supplements highlights the impact of the pandemic on consumer behavior and priorities.

The fact that 87% of consumers read ingredients and expiration date on packaged food goods and fact that they read the same information before pandemic shows that there is a high awareness of nourishment. The fact that traditional homemade food is prepared without preservatives and the increase in consumption that food during Covid-19 pandemic supports this finding. 66% of consumers claimed spices; 91% claimed dairy and dairy products; 88% claimed agricultural products have positive effects on their dietary habits and immune system. Another finding is that consumption of these products increased during pandemic according to consumers' economic situation and supply conditions and they also started to consume goods they have never consumed before pandemic like royal jelly and propolis.

Covid-19 pandemic also resulted in changes in where consumers supply their food. Causes like; district bazaars have not been set up for a long time, changes in consumers' economic conditions, the reflection of disruptions in the national economy on food prices, demand on organic and fresh products have important share on those changes. Furthermore, lockdowns enforced on weekends throughout Türkiye and the fact that it is only possible to get food products from the closest shops caused changes in the places where consumers require their food Another finding related to the consumer behavior is the number of consumers who procure their food online is increased.

There are lots of factors when individuals purchase food products. In some cases, there is a high probability they are influenced by advertisements or other individuals. However, 57% of consumers stated that they are not being influenced by anybody and 21% of them stated they are influenced by their families. This situation shows that the biggest influence on their food product shopping comes from their close circle.

While there is an increase in the consumption of food products that form the basis of a healthy diet, like fruits, vegetables and eggs, the lack decrease shows that consumers act more sensitive about a healthy diet during Covid-19 pandemic. Correspondingly, decrease in the consumption of carbonated beverages and packaged ready to serve foods supports this finding. However, the high rate of increase in the consumption of pastries and dried fruits and nuts are examples of negative impacts of the necessity of staying home and the limitation of physical activities because of Covid-19 pandemic.

According to those findings:

- In order to meet the demand for organic goods, it would be beneficial for both producer and consumer that supporting organic goods producers via agricultural policies.
- Nutrition security should be given priority in policy making in order to moderate the impacts of Covid-19 or other emergency situations on food supply.
- Considering the increase in desire to supply goods online and this behavior would stay permanent for most of the consumers, revising the marketing of food goods would increase the competitiveness of suppliers.
- During situations that have negative impacts on health, physical activities are as important as a healthy diet and considering those situations while considering restrictions would be beneficial for protecting public health.

In conclusion, this study provides valuable insights into the effects of the COVID-19 pandemic on the dietary habits and food demands of consumers in Tekirdağ, Türkiye and contributes to the existing body of research in this field.

#### **Ethical Statement**

There is no need to obtain permission from the ethics committee for this study

#### **Conflicts of Interest**

We declare that there is no conflict of interest between us as the article authors.

#### **Authorship Contribution Statement**

The authors declare that they have contributed to the article at a similar rate.

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