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# Agricultural and Food Products Sectors During and Post The Covid-19 Pandemic From Consumer Perspective in Türkiye

**Bahar Aydin Can**[1,*]

[1] Kocaeli University, Izmit Vocational School, Department of Crop and Animal Production, Kocaeli, Türkiye

- **HIGHLIGHTS**

- The Covid-19 pandemic has reminded the whole world of the importance of the agricultural and food sectors.
- Consumers believe that Türkiye will prove to be a self-sufficient country in the agricultural and food sectors.
- Consumers think that the number of agricultural entrepreneurs will increase for the post-pandemic period.

**Abstract**

The purpose of this research is to determine and analyze the opinions of consumers in Türkiye on agricultural and food products sectors during and post pandemic, the points they pay attention to while purchasing agricultural and food products, and their degree of satisfaction with their place of living. The main material of the research consists of the data collected by means of an online survey conducted on the consumers (n=1945) living in Türkiye. The data obtained were used to present their socio-demographic structure with frequency distributions. In addition, a chi square test was conducted to analyze the relationship between their opinions on agricultural and food products sectors during and post pandemic and their demographic characteristics. 5-point Likert scale was employed to demonstrate their attitudes and opinions. According to the results of the research, consumers strongly agreed that agricultural and food products' prices had increased during the pandemic. 61.9% of the consumers strongly agreed that agricultural and food products' prices had increased during the pandemic. 60.5% of the consumers indicated they wanted to live in a rural area during the pandemic. The relationship between consumers' opinions on agricultural and food sectors and most socio-demographic characteristics was found to be significant for the period of pandemic and thereafter. This study may be useful in to predict the change of food and agricultural products consumer demand in post-pandemic.

**Keywords:** Agricultural and food products; consumer; COVID-19; pandemic; Türkiye

## 1. Introduction

Coronavirus disease 2019 (COVID-19) was first identified in December 2019 in the Huanan Seafood Wholesale Market located in Wuhan, Hubei, China and has spread almost all over the world, particularly in China. The World Health Organization eventually declared the coronavirus outbreak a global pandemic (WHO 2020). As of 10 May 2022, there are 515748861 cases and 6255835 deaths throughout the world (WHO

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***Correspondence:** baharcan@kocaeli.edu.tr
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2022). Türkiye, with 1858 cases and 7 deaths on the same date, is thought to be among the countries which have the potential of getting through the pandemic with less loss thanks to the early measures taken.

In the short term, key sectors such as agriculture, food, tourism, transportation and especially health were negatively affected by the pandemic. This process started to threaten the global economy, and life in many countries of the world came to a standstill (Yorulmaz and Kaplan 2020). Agriculture is one of the substantial sectors for the world economy and indispensable for human development (Lopez-Ridaura et al. 2019). With the outbreak of pandemic, agriculture and health came into prominence as two strategic sectors in almost all countries of the world (Lopez-Ridaura et al. 2019; Abdelhedi and Zouari 2020; Kogo et al. 2020). Following the declaration of pandemic, people flooded into supermarkets to buy cereals, legumes, fruits and vegetables, indicating that people were in a struggle for meeting their basic needs rather than buying expensive items. This is because nutrition is vital for people to survive, strengthen their immune system and stay healthy (Dogan and Dogan 2020).

People always need sufficient, safe and nutritious agricultural and food products for an active and healthy life. During the pandemic, consumers have been meeting their food needs predominantly from online groceries because they think going shopping can increase the risk of being infected with COVID-19. In China and Europe, online shopping for food has been on the rise since the beginning of pandemic (Cheng 2020; Von Abrams 2020; Goddard 2020), which has resulted in long delivery times (Gray 2020; Debter 2020). According to a research conducted by Nielsen Research Company in March 2020, about half (49%) of the consumers in Türkiye expressed they were planning to buy products such as food and beverages online in the medium and long term. Since consumers are expected to be isolated at home within this period, cooking at home has become even more important. As a result, there has been a tremendous increase in the demand of staple food products such as flour, yeast and pasta. In the study conducted on consumers in Türkiye, it was found that consumers mostly bought pasta and dried pulses products during the pandemic period (Ince and Kadıoglu, 2020). At the onset of pandemic, people rushed into supermarkets to pile up food (Royte 2020). Panicked consumers were stockpiling the foods, which in turn affected food availability and price (Poudel et al. 2020).

With the emergence of pandemic, it has become evident, not only in Türkiye but also in the world, that agriculture is a vital and strategic sector. The emergence of pandemic coincided with the period of sowing, planting, fertilizing, pest control and maintenance for vegetables and crops such as corn, cotton, sunflower, etc. in Türkiye. Problems occurring during this period or omissions made in fundamental matters such as sowing, planting, maintenance, etc. may lead to yield loss for a season and keep consumers from reaching adequate amounts of food (Dogan and Dogan 2020). Moreover, travel bans imposed in numerous countries of the world have caused farmers to face the shortage of agricultural inputs like seed, fertilizer and pesticides in global trade. China is the leading fertilizer producer and exporter of the world. The lockdown in China has severely affected international fertilizer trade (Poudel et al. 2020). For this reason, the agricultural sector can play a lifesaving role in the future of countries through accurate, efficient and timely measures to be taken in this critical process. By improving nutrition, agricultural development should facilitate combating infections (Nouh et al. 2020).

The online mapping systems regarding trade restrictions as shared by the International Food Policy Research Institute (IFPRI) and the International Trade Centre (ITC) allows for monitoring different types of protective policy trends adopted by countries. Accordingly, since the beginning of pandemic, 18 countries have introduced temporary restrictions or bans on the export of 26 agricultural products (Eren 2020). The restrictions to be imposed by countries on agricultural and food products for the purpose of meeting their own needs in the upcoming days may cause consumers to purchase products at higher prices in food markets.

Both agricultural and food sectors are vital for people to satisfy their nutritional requirements to survive during and post pandemic. Therefore, maintaining the continuity of these sectors is of great importance. Most of the studies on the COVID-19 pandemic have been conducted in the field of health. There are also studies on countries' agricultural and food sectors during the pandemic. There are several studies on effects of the pandemic on food and food systems (Blay-Palmer et al. 2020; Chow 2020; Cheng 2020; Dogan and Dogan 2020; Emmad and Pena 2020; Eren 2020; Ergenc 2020; Galanakis 2020; Yu et al. 2020). Some of the other studies are also related to socioeconomic effects of the pandemic on countries (Acıkgoz and Gunay 2020; Alpago and Alpago 2020; Bapuji et al. 2020; Guven 2020; Nicola et al. 2020; Zhang et al. 2020; Castellini et al. 2021), impacts of the pandemic on agriculture (Meine 2020; Poudel et al. 2020; Villulla 2020; Mishra et al. 2021) and food and nutritional security in the pandemic (Lal 2020; Nouh et al. 2020; Mukiibi 2020; Nyamwanza and Sinyolo 2020; Shahbaz et al. 2020). However, the number of studies on consumers during this period is limited (Cakıroglu et al. 2020; Danısmaz 2020; Song et al. 2020; Qi et al. 2020; Ince and Kadıoglu, 2020; Widayat 2020; Chenarides et al. 2021; Temizkan et al. 2021; Tolun and Bulut, 2021; Roe et al. 2021; Kılıc and Eryılmaz, 2022; Tepe et.al., 2022).

Thus, it is significant to investigate consumers' attitudes towards agricultural and food products and their opinions on these two sectors during the ongoing pandemic and also necessary for determining the measures that can be taken for the post-pandemic period.

The purpose of the present research is to determine and analyze the demographic characteristics of consumers in Türkiye as well as their opinions on agricultural and food products sectors for the period of pandemic and for post-pandemic period, the points they pay attention to while purchasing agricultural and food products, and their degree of satisfaction with their place of living.

## 2. Materials and Methods

The main material of this research consists of the primary data obtained from the consumers living in Türkiye. The research data were collected from 1945 consumers that were selected by conveniency sampling by means of an online survey conducted in May 2020. Since the research subject is current, the data were collected in a short span of time. An online survey was preferred to a face-to-face one for health and safety reasons due to the pandemic. In addition, available publications, articles and internet records were used. The research survey is made up of 3 parts with 45 questions in total. There are 11 questions determining socio-demographic characteristics in the first part. The second and third parts comprise 34 questions determining consumers' behavior patterns in purchasing agricultural and food products and their opinions on agricultural and food sectors during and after the pandemic, respectively.

Before the survey form used in the research was created, it was standardized online and tested on Google Forms. The online survey was conveyed to as many consumers as possible by means of social media (Facebook and Twitter) and mobile phone so as to be answered within one month. A total of 1945 survey forms were received back and evaluated as the research data.

5-point Likert scale was employed to designate consumers' point of views of and attitudes towards agricultural and food sectors for the period of pandemic and for post-pandemic period. In the questionnaire form, the Servqual scale developed by Parasuraman et al. (1988) was used based on the 5-Likert Scale (1 = Strongly disagree; 5 = Strongly agree).

In the analysis of the data obtained, SPSS 22.0 statistical analysis software package was used. Consumers' socio-demographic structure was demonstrated with frequency distributions. Besides, the relationship between consumers' opinions on agricultural and food products sectors for the period of pandemic and for post-pandemic period and their demographic characteristics was analyzed by means of a chi-square test.

## 3. Results and Discussion

### *3.1. Socio-economic characteristics of consumers*

Information about the socio-economic characteristics of consumers is given in Table 1. Of the consumers who took part in the survey, 53.4% were female and 46.6% were male. The age group of 20 to 29 years had the biggest share (57.4%), followed by that of 30 to 39 years (15.7%) and that of 40 to 49 years (12.2%), respectively. Since the rate of Internet and social media use is higher among the youth, it was predominantly younger people who joined the survey. In terms of educational background, the largest group consisted of high school graduates (33.1%), followed by bachelor's degree holders (27.9%) and associate degree holders (21%), respectively. 59.2% of the respondents were single, while 40.8% were married. 69.1% of them were the owner of the property they lived in. In terms of profession, 30.6% were students, 25.8% were private sector employees, and 12.2% were housewives. 33.2% of the respondents had monthly income of family between 3001 TRY and 5000 TRY, and 31.1% between 1001 TRY and 3000 TRY. 46.7% lived in a district center, 39.5% in the provincial center, and 13.8% in a town/village. The consumers who had 3-4 members in their family ranked first (54.4%), followed by those with 5-6 family members (29%) and those with 1-2 family members (11.8%), respectively.

**Table 1.** Socio-economic characteristics of consumers

| | n | % | | n | % |
|---|---|---|---|---|---|
| *Gender* | | | *Profession* | | |
| Female | 1038 | 53.4 | Public sector | 203 | 10.4 |
| Male | 907 | 46.6 | Private sector | 502 | 25.8 |
| Total | 1945 | 100.0 | Self-employed | 146 | 7.5 |
| | | | Student | 596 | 30.6 |
| *Age* | | | Housewife | 238 | 12.2 |
| 20-29 | 1116 | 57.4 | Retired | 148 | 7.6 |
| 30-39 | 305 | 15.7 | Unemployed | 112 | 5.9 |
| 40-49 | 238 | 12.2 | Total | 1945 | 100.0 |
| 50-59 | 191 | 9.8 | | | |
| 60 and above | 95 | 4.9 | *Family income (month/TRY)* | | |
| Total | 1945 | 100.0 | 1000 TRY and below | 80 | 4.1 |
| | | | 1001 TRY - 3000 TRY | 605 | 31.1 |
| *Educational Background* | | | 3001 TRY - 5000 TRY | 645 | 33.2 |
| Literate | 15 | 0.8 | 5001 TRY - 7000 TRY | 314 | 16 |
| Primary school | 120 | 6.2 | 7000 TRY and above | 301 | 15.6 |
| Secondary school | 162 | 8.3 | Total | 1945 | 100.0 |
| High school | 643 | 33.1 | | | |
| Associate degree | 408 | 21.0 | *Place of living* | | |
| Bachelor's degree | 542 | 27.8 | Provincial center | 767 | 39.5 |
| Master degree | 55 | 2.8 | District center | 909 | 46.7 |
| Total | 1945 | 100.0 | Town/village | 269 | 13.8 |
| | | | Total | 1945 | 100.0 |
| *Marital Status* | | | | | |
| Married | 793 | 40.8 | *Number of family members* | | |
| Single | 1152 | 59.2 | 1-2 | 229 | 11.8 |
| Total | 1945 | 100.0 | 3-4 | 1057 | 54.4 |
| | | | 5-6 | 564 | 29.0 |
| *Home ownership* | | | 7 and above | 95 | 4.8 |
| Owner | 1344 | 69.1 | Total | 1945 | 100.0 |
| Tenant | 573 | 29.5 | | | |
| Public Housing | 28 | 1.4 | | | |
| Total | 1945 | 100.0 | | | |

*3.2. Opinion of consumers on their place of living*

The consumers who took part in the research were asked the question "Are you satisfied with your place of living?", and 1641 (84.4%) of them responded "Yes", while 304 (15.6%) of them "No". As is seen, the majority of consumers were satisfied with the place they lived in.

In the survey, consumers were asked the question "has the pandemic caused you to want to live in a rural area?", and 1177 (60.5%) of them responded "yes", while 768 (39.5%) of them "no". Population is usually denser in city centers, and population density is a significant factor in the spread of pandemic. For this reason, consumers preferred rural areas to the city center because they thought being in a rural area was safer. As a result of chi-square analysis, the relationship between consumers' place of living and their willingness to live in a rural area was found to be significant ($p<0.05$) (Table 2). The group that wanted to live in a rural area most (64.1%) consisted of the consumers living in the provincial center. Besides, of the consumers who were willing to live in a rural area, 50.5% were female and 49.5% were male.

**Table 2.** Relationship between consumers' place of living and their willingness to live in a rural area

| Willingness to live in a rural area | Place of living | | | | | | Chi-square test result | | |
|---|---|---|---|---|---|---|---|---|---|
| | Provincial center | | District center | | Town/village | | $\chi^2$ | df | p |
| | n | % | n | % | n | % | | | |
| Yes | 492 | 64.1 | 531 | 58.4 | 154 | 57.2 | 7.109 | 2 | 0.029* |
| No | 275 | 35.9 | 378 | 41.6 | 115 | 42.8 | | | |

*statistically significant ($p<0.05$)

*3.3. Opinions of consumers on agricultural and food products sectors during the pandemic*

The answers given to the questions intended to find out the consumers' preferences while buying agricultural and food products during the pandemic and their opinions on these two sectors were assessed. The frequency of agreement with the statements given was assessed based on percentages and mean points (Table 3).

The statement that agricultural and food products' prices have increased during the pandemic was the one agreed by consumers most with an mean point of 4.29. During the pandemic, consumers have spent more time at home and allocated a bigger share to food expenses. Moreover, due to travel restrictions, compared to the pre-pandemic period, they have paid higher prices for agricultural and food products. Based on study by Qi et al. (2020), during COVID-19 crisis, they revealed that high prices of green food.

According to the findings, the risk of being infected with COVID-19 is higher for the middle aged and above and due to legal restrictions, consumer preferred to buy such products from the nearest supermarket during this period. Likewise, Temizkan et al. (2021) conducted a study on consumers at during the pandemic and stated that needs of 65% of the respondents preferred to buy from market.

The survey showed that consumers who strongly agreed with the statement "I have been preferring to pay by credit card instead of cash while buying agricultural and food products from the supermarket" (36.4%). In a study they conducted on consumers in China, Song et al. (2020) suggested to make electronic payment instead of using cash as a means of protection from contracting coronavirus. Another study conducted in Türkiye also found that 90% of the participants preferred credit card as a paying method during the pandemic (Ozsaatci and Karaboga, 2022)

Out of the consumers who strongly agreed with the statement "I have been preferring to buy agricultural and food products from the online grocery because it is safer" between the age of 20 and 29 (63.0%) had the biggest shares. Danısmaz (2020), in a study she carried out on consumers in Türkiye during the pandemic, founded out the percentage of online grocery shopping increased from 18% (pre-epidemic) to 44.5% (during the epidemic). Likewise, Widayat (2020) conducted a study on adolescent consumers at the age of 15-25 during the pandemic and reported that 42% of the respondents usually ordered food online. The present study has similar findings.

Out of the consumers who strongly agreed with the statement "I have been preferring to consume the agricultural and food products that strengthen my immune system", the largest group was the age group of 50 to 59 years (48.2%), indicating that older age groups have been taking better care of their nutrition during the pandemic to protect themselves. Galanakis (2020), suggests that the pandemic may also increase demand for food products that are believed to boost immune systems.

**Table 3.** Opinions of consumers on agricultural and food products sectors during the pandemic

| Statements | 1 | | 2 | | 3 | | 4 | | 5 | | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | |
| Agricultural and food products' prices have increased. | 64 | 3.3 | 74 | 3.8 | 297 | 15.3 | 306 | 15.7 | 1204 | 61.9 | 4.29 |
| It has been harder to find imported agricultural and food products. | 518 | 26.6 | 339 | 17.4 | 593 | 30.5 | 214 | 11.0 | 281 | 14.4 | 2.74 |
| Interprovincial travel restrictions have made it harder to find agricultural workers. | 200 | 10.3 | 172 | 8.8 | 551 | 28.3 | 339 | 17.4 | 683 | 35.1 | 3.58 |
| Seasonal agricultural workers have lost revenue. | 115 | 5.9 | 127 | 6.5 | 437 | 22.5 | 392 | 20.2 | 874 | 44.9 | 3.91 |
| Consumers have been preferring to buy packaged food products. | 120 | 6.2 | 133 | 6.8 | 489 | 25.1 | 420 | 21.6 | 783 | 40.3 | 3.82 |
| I have been preferring to buy agricultural and food products from the supermarket. | 150 | 7.7 | 126 | 6.5 | 479 | 24.6 | 424 | 21.8 | 766 | 39.4 | 3.78 |
| The frequency of buying agricultural and food products from the street market has decreased. | 268 | 13.8 | 224 | 11.5 | 529 | 27.2 | 327 | 16.8 | 597 | 30.7 | 3.39 |
| My consumption of convenience foods has decreased, while that of natural foods has increased. | 133 | 6.8 | 166 | 8.5 | 540 | 27.8 | 412 | 21.2 | 694 | 35.7 | 3.70 |
| I have been ordering food online more frequently. | 760 | 39.1 | 197 | 10.1 | 340 | 17.5 | 247 | 12.7 | 401 | 20.6 | 2.65 |
| I have been buying agricultural and food products from the supermarket in higher amounts and more frequently. | 214 | 11.0 | 178 | 9.2 | 472 | 24.3 | 408 | 21.0 | 673 | 34.6 | 3.59 |
| The increase in agricultural and food products' prices is a result of lack of production. | 335 | 17.2 | 244 | 12.5 | 548 | 28.2 | 354 | 18.2 | 464 | 23.9 | 3.18 |
| I have been preferring to pay by credit card instead of cash while buying agricultural and food products from the supermarket. | 230 | 11.8 | 188 | 9.7 | 459 | 23.6 | 360 | 18.5 | 708 | 36.4 | 3.58 |
| I have been preferring to buy agricultural and food products from the online grocery because it is safer. | 595 | 30.6 | 268 | 13.8 | 489 | 25.1 | 261 | 13.4 | 332 | 17.1 | 2.72 |
| I have been preferring to consume the agricultural and food products that strengthen my immune system. | 108 | 5.6 | 113 | 5.8 | 457 | 23.5 | 480 | 24.7 | 787 | 40.5 | 3.88 |

1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

*3.4. Opinions of consumers on agricultural and food products sectors for the post-pandemic period*

5-point Likert scale was used to evaluate consumers' preferences while buying agricultural and food products and their degree of agreement with the opinions on these two sectors for the post-pandemic period (Table 4).

Of all statements with which the consumers agreed for the post-pandemic period, the statement "hygiene will be a determining factor in buying agricultural and food products" had the highest mean point (4.13), followed by "the demand for the agricultural and food products that strengthen the immune system will increase" (3.86) and "the number of entrepreneurs planning to invest in agriculture will increase" (3.71), respectively. Djekic et al.(2021), in a study she carried out companies confirmed implementation of more restrictive hygiene procedures during the pandemic. After the pandemic, hygiene will constitute an important element for consumers in food consumption.

According to the findings, the consumers who strongly agreed with the statement "agricultural and food products' prices will increase", those with a family income up to 1000 TRY (41.3%) and those retired (51.4%) had the biggest shares. Consumers in India have also noted that food prices have increased in the pandemic (Cariappa et al. 2021). For example, (Ruan et al. 2021), the daily price of chinese cabbage sharply increased by 46% initially in China.

Out of the consumers who strongly agreed with the statement "hygiene will be a determining factor in buying agricultural and food products", women (61%) and retired consumers (64.2%) constituted the largest groups.

The results showed that consumers who strongly agreed with the statement "the number of entrepreneurs planning to invest in agriculture will increase", the highest percentages belonged to those having a family income of 7000 TRY and above (31.2%) and those retired (40.5). After the pandemic, farming can give entrepreneurship opportunities to many jobless people and can meet the demand of growing population (Mishra and Pattnaik 2021).

According to survey data, consumers who strongly agreed with the statement "agricultural education will gain importance".

**Table 4.** Opinions of consumers on agricultural and food products sectors for the post-pandemic period

| Statements | 1 | | 2 | | 3 | | 4 | | 5 | | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | |
| There will be a decrease in our agricultural production. | 479 | 24.6 | 306 | 15.7 | 539 | 27.7 | 292 | 15.0 | 329 | 16.9 | 2.83 |
| Agricultural and food products' prices will increase. | 154 | 7.9 | 187 | 9.6 | 522 | 26.8 | 442 | 22.7 | 640 | 32.9 | 3.63 |
| I am planning to make agricultural production. | 473 | 4.3 | 302 | 15.5 | 487 | 25.0 | 270 | 13.9 | 413 | 21.2 | 2.92 |
| The demand for the agricultural and food products that strengthen the immune system will increase. | 92 | 4.7 | 132 | 6.8 | 476 | 24.5 | 496 | 25.5 | 749 | 38.5 | 3.86 |
| Countries may impose restrictions or a quota on imported agricultural and food products. | 169 | 8.7 | 187 | 9.6 | 586 | 30.1 | 441 | 22.7 | 562 | 28.9 | 3.53 |
| Hygiene will be a determining factor in buying agricultural and food products. | 69 | 3.5 | 95 | 4.9 | 367 | 18.9 | 390 | 20.1 | 1024 | 52.6 | 4.13 |
| There will be no problem in finding seasonal agricultural workers. | 145 | 7.5 | 175 | 9.0 | 562 | 28.9 | 458 | 23.5 | 605 | 31.1 | 3.61 |
| The number of entrepreneurs planning to invest in agriculture will increase. | 92 | 4.7 | 170 | 8.7 | 568 | 29.2 | 495 | 25.4 | 620 | 31.9 | 3.71 |
| Rural settlement will grow. | 175 | 9.0 | 241 | 12.4 | 593 | 30.5 | 468 | 24.1 | 468 | 24.1 | 3.41 |
| Agricultural sector may become one of the most revenue-generating sectors. | 113 | 5.8 | 202 | 10.4 | 642 | 33.0 | 478 | 24.6 | 510 | 26.2 | 3.55 |
| Agricultural education will gain importance. | 120 | 6.2 | 189 | 9.7 | 544 | 28.0 | 495 | 25.4 | 597 | 30.7 | 3.64 |
| Türkiye will become one of the leading exporters of different agricultural and food products. | 211 | 10.8 | 242 | 12.4 | 583 | 30.0 | 420 | 21.6 | 489 | 25.1 | 3.37 |
| Türkiye will prove herself as a self-sufficient country in agricultural and food sectors. | 197 | 10.1 | 178 | 9.2 | 502 | 25.8 | 425 | 21.9 | 643 | 33.1 | 3.58 |

1=strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

### *3.5. Opinions of consumers on agricultural and food products sectors with demographic characteristics the pandemic and post-pandemic period*

The data results of $\chi^2$ test showed that there are significant relationship between the level of education and consumption of convenience foods has decreased ($p<0.01$) and preferring to consume the agricultural and food products that strengthen the immune system in the during pandemic( Table 5). A study carried out in Italy, psycological reactions to COVID-19 emergency have effected the consumers intention to purchase sustainable food products (Castellini et al. 2021).

Additionally, there is a significant ($p<0.05$) relationship between the frequency of buying agricultural and food products from the street market has decreased and level of education. Therefore in consumer with high-education level, the frequency of going to street market has decreased.

Chi-square analysis show that significant in ($p<0.05$) profession groups and consumer have been preferring to buy packed good products. The student (28.8 %) and private sector (26.2 %) are the groups most willing to buy packed food.

According to the data, the most of those who say, "I have been ordering food online more frequently" are those with incomes of 3001 TRY-5000 TRY.

**Table 5.** Comparison of consumer opinions on agricultural and food products sectors with demografic characteristics at the during pandemic and post post-pandemic period

| **During Pandemic Period** | $\chi^2$ | **df** | **p** |
|---|---|---|---|
| Consumers have been preferring to buy packaged food products – Profession | 40.278 | 24 | 0.020** |
| My consumption of convenience foods has decreased, while that of natural foods has increased – Educational Background | 57.684 | 24 | 0.000* |
| I have been ordering food online more frequently – Family Income | 27.210 | 16 | 0.039** |
| I have been preferring to buy agricultural and food products from the supermarket – Number of Family Members | 41.142 | 24 | 0.016* |
| I have been buying agricultural and food products from the supermarket in higher amounts and more frequently – Gender | 19.655 | 4 | 0.001* |
| The frequency of buying agricultural and food products from the street market has decreased – Educational Background | 37.931 | 24 | 0.035** |
| The press statements on the consumption of agricultural and food products that strengthen the immune system are effective in product choices – Educational Background | 39.268 | 24 | 0.026** |
| I have been preferring to consume the agricultural and food products that strengthen my immune system – Educational Background | 55.763 | 24 | 0.000* |
| I have been preferring to buy agricultural and food products from the online grocery because it is safer – Place of Living | 22.951 | 8 | 0.003* |
| **Post Pandemic Period** | $\chi^2$ | **df** | **p** |
| Agricultural and food products' prices will increase – Family Income | 26.884 | 16 | 0.043** |
| The demand for the agricultural and food products that strengthen the immune system will increase – Age | 33.949 | 16 | 0.006* |
| The number of entrepreneurs planning to invest in agriculture will increase – Family Income | 30.964 | 16 | 0.014* |
| Hygiene will be a determining factor in buying agricultural and food products – Educational Background | 40.734 | 24 | 0.018* |
| Agricultural education will gain importance – Profession | 61.093 | 24 | 0.000* |
| Rural settlement will grow – Marital Status | 15.973 | 4 | 0.003* |
| Agricultural sector may become one of the most revenue-generating sectors – Profession | 39.429 | 24 | 0.025** |
| Türkiye will become one of the leading exporters of different agricultural and food products – Gender | 16.099 | 4 | 0.003* |
| Türkiye will prove herself as a self-sufficient country in agricultural and food sectors – Gender | 17.918 | 4 | 0.001* |

*statistically significant ($p<0.01$), **statistically significant ($p<0.05$)

A chi-square analysis was conducted to designate the relationship between consumers' opinions on agricultural and food products sectors for the post-pandemic period and their demographic characteristics, and the results are given in Table 5. According to the analysis results, the relationship between the opinions that the demand for the agricultural and food products that strengthen the immune system will increase and age is significant ($p<0.01$). 45% of consumers aged 60 and over are the group most involved in this idea.

According to the data, the relationship between the opinion that agricultural sector may become one of the most revenue-generating sectors and profession is also significant ($p<0.05$). According to a research conducted by Mishra and Pattnaik in 2021, urban agriculture can play a significant role in developing healthy and sustainable urban cities.

The relationship between the opinion that rural settlement will grow and marital status is significant ($p<0.01$). It was found that 45.05% of singles and 52.58% married consumers are willing to live in rural settlement.

The results showed that the relationship between the opinion that Türkiye will become one of the leading exporters of different agricultural and food products and and gender is significant ($p<0.01$).

## 4. Conclusion

Since its emergence, the COVID-19 pandemic has considerably affected people's view of life, habits and preferences as well as consumption patterns. In fact, throughout the human history, epidemics have led to massive social changes for both current and future years (Guven 2020).

During the pandemic, as the number of cases has risen, governments have ordered curfews and travel restrictions in an attempt to halt its spread, which in turn has impacted the global food system and resulted in delays especially in the delivery of imported products to consumers. In the first days of pandemic, local agricultural and food products were sold at higher prices. Disruptions in agricultural production and food production, inter-country restrictions on marketing, consumers' stockpiling of products due to food concerns, and disruptions in the supply of agricultural production inputs were effective in increasing prices of agricultural and food products. As can be seen from the results of the present research, 61.9% of the consumers agreed that agricultural and food products' prices had increased for the pandemic period, while the percentage dropped down to 32.9 for the post-pandemic period. These figures indicate that consumers believe agricultural and food products' prices will return to normal after the pandemic.

During the pandemic period, by The Ministry of Agriculture and Forestry especially for farmers, special brochures containing measures to be taken in the field, greenhouse, barn and poultry were distributed. Brochures were also distributed for bread and bakery businesses and inspections for food businesses were increased. In addition, farmers' loan debts were deferred and interest-free installment. It is believed that support such as increasing the amount of agricultural support and Grant seed support to ensure the security of agricultural production and supply will also make a significant contribution to farmers.

The current COVID-19 pandemic demonstrates to the entire world that agricultural and food sectors are and will be the most vital and strategic ones. In this respect, governments should pursue the policies and take the measures necessary for maintaining existing agricultural areas and increasing agricultural production against probable epidemics and natural phenome-non. Thanks to having different climates and ecological conditions as well as rich vegetation, Türkiye has the potential of producing many different types of fruits, vegetables and field crops to meet nutritional requirements and is highly advantageous in fighting the pandemic with an increase in agricultural and food production.

According to the results of the research, during the pandemic, most of the consumers have preferred supermarkets over street markets, credit card over cash, and online shopping over physical shopping for buying agricultural and food products, which has resulted in the adoption of virtual applications by numerous supermarkets and new employment opportunities for people. Additionally, among young and single consumers, those who buy agricultural and food products from a online supermarket are more likely. Because young people were more adept at technology and believed it was safer in a pandemic, they preferred the online supermarket.

Most of the consumers stated they took care to consume the agricultural and food products strengthening the immune system and buy packaged products manufactured in accordance with hygiene rules. So, growers and producers are suggested to take such opinions and especially a potential increase in the demand of products strengthening the immune system into consideration in production for the post-pandemic period.

The period of pandemic can influence consumers’ choice of place of living in the forthcoming years. In the scope of this research, 60.5% of the consumers indicated they wanted to live in a rural area during the pandemic, supported by the popular desire for a house with a garden far from the city. So, this can be taken into account in city and regional planning and house building.

Consumers think that the number of agricultural entrepreneurs will increase for the post-pandemic period. The number of investments can go up and several people can become an entrepreneur with the increase to be made by the government in the amount and range of agricultural production. Thus, Türkiye stands a good chance of producing some of the agricultural and food products imported.

In conclusion, according to the results of this re-search conducted, consumers are in the opinion that Türkiye will prove herself as a self-sufficient country in agricultural and food sectors and become one of the leading exporters of several products. Türkiye has the opportunity to turn the position she holds in agricultural and food sectors into an advantage. Agricultural and food production should be planned by taking into consideration the experiences gained during the pandemic, consumers’ preferences as well as probable epidemics and natural phenomenon and creating safer and more sustainable agricultural and food systems in line with the digital age. As the pandemic continues to threaten the world, the importance of the agricultural and food sectors is growing in meeting the international nutritional needs. For this reason, the importance and strategies that countries will take in the agriculture and food sectors should be the most important priority issues for the post-epidemic.

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