Uluslararası Tarım Araştırmalarında Yenilikçi Yaklaşımlar Dergisi
International Journal of Innovative Approaches in Agricultural Research 2023, Vol. 7 (3), 260-279
https://doi.org/10.29329/ijiaar.2023.602.2


Original article

# Investigation of Pasta Consumption Habits in Türkiye

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**Abstract**

This study aim to determine pasta consumption habits in Türkiye. Durum wheat is the basic raw material of pasta. Türkiye is one of the most important durum wheat producing country in the world. Pasta is widely consumed and cooked in household for centuries due to its long shelf life, easy preparation, delicious taste and affordable food. In the study; considering the geographical regions of Türkiye, the provinces with the highest population in the regions were biasedly selected. While number of surveys to be conducted with consumers was determined as 1815 according to the simple random sampling method, they were completed in 2019 through face-to-face interviews with consumers. Results indicated that 30% of households in Türkiye bought pasta once a week, 37.3% of households' cooked pasta once a week. On the other hand, average consumption per person was found as 11.95 kg. Results also determined that price and quality are the most important criterias of consumers in demanding pasta . It was observed that consumers tended to eat healthier rather than meet their nutritional needs. Although pasta has an important place in Turkish cuisine, the results of the research proved again that pasta was a food consumed by all age groups in Türkiye. Considering that sauces come to the forefront in countries where pasta is consumed the most, developing and recommending sauces suitable for the Turkish palate may be one of the ways to increase pasta consumption.

**Keywords:** Pasta consumption, Pasta types, Consumption habits, Türkiye.

**Received:** 05 June 2023 * **Accepted:** 01 August 2023 * **DOI:** https://doi.org/10.29329/ijiaar.2023.602.2

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## INTRODUCTION

Pasta has been produced and consumed since ancient times. It was estimated that pasta-like products were produced in Ancient Rome, European countries, and China and first consumed by the Chinese around 1700 BC (TMSD, 2022). It was stated that pasta was brought to Europe (Italy) by Marko Polo on his return from his travels in the Far East in 1292 and dry pasta production in its current commercial form was quite new (Cubadda and Carcea, 2003).

Pasta consumption and therefore the demand for pasta is increasing rapidly in the world. The main reasons for this increase are that wheat is a staple food and pasta has high nutritional value, is easy to prepare, is an affordable food, and can be stored for a long time without spoiling (Akın, 2017). World annual pasta production is approximately 16.9 million tons, with Italy ranking first with 3.89 million tons of production, the USA ranking second with 2 million tons, and Türkiye ranking third with 1.90 million tons. In terms of annual pasta consumption per capita, Italy ranks first with 23.5 kg, Tunisia ranks second with 17 kg, and Türkiye ranks 14$^{th}$ with 7.53 kg (IPO, 2022). The main reason why pasta consumption is in the 14$^{th}$ place in Türkiye is the consumption of bulgur, another traditional durum wheat product that is an alternative to pasta. Despite this, pasta consumption is increasing every year.

Türkiye, particularly Southeastern Anatolia Region, is a suitable area for the cultivation of durum wheat, the main raw material of pasta, due to its topographical features, soil characteristics, and agricultural tradition. Pasta is a semi-prepared food prepared by kneading water and semolina, obtained by milling *Triticum durum* wheat under appropriate conditions, giving it different shapes, and drying it (Muslu, Gider, Dereli, & Yüksel, 2021). It is defined as an important food source because the complex carbohydrates in its structure can be rapidly converted into energy and, it is very rich in vitamins and minerals and has high calories (Demirkol and İçöz, 2002). Pasta is a staple food of people's daily meals. Additionally, consumers frequently describe it as "good" and "healthy," considering it to be a "harmless" product (Altamore et al., 2018).

The food quality definition varies according to the numerous stakeholders in its value chain. However, the main criteria for defining food quality are related to their increased understanding of the links existing between diet and health, their awareness of quality traits, and the access to information about new production and processing technologies. These criteria are three: the first relates to the organoleptic sphere (seasonality, freshness, taste, and appearance); the second relates to the location and production methods (certifications, organic production, local production); and the third relates to the brand and price (Mascarello et al., 2015; Altamore et al., 2020).

There are many studies on the enrichment of pasta, which is the most consumed food after bread among bakery products since it is consumed by individuals from all age groups (Özgören and Yapar, 2015). In developed countries producing durum wheat, many studies were carried out to determine the relationships among wheat, semolina, and pasta quality parameters (Ova and Saygın, 1991; Padalino et al., 2014; Deng et al., 2017). There are, however, few economic studies investigating pasta consumption and preferences in the world (Conto et al., 2016; Altamore et al., 2018, 2020). Therefore, preferences and consumption of pasta in Türkiye should be studied in-depth, considering that pasta is one of the staple foods in the diet of Turkish people.

In this study, it was aimed to determine the consumption habits and consumer preferences for pasta, which is seen as an important food source for consumers, in Türkiye.

## MATERIALS and METHODS

We state that all Human and Animal Rights are considered; therefore, we pursued this study without violating such rights. The primary data of the research consisted of the data obtained from the questionnaires filled out as a result of face-to-face interviews with pasta consumers. Considering the geographical regions of Türkiye, the survey was conducted with the consumers living in Istanbul, Ankara, Izmir, Antalya, Diyarbakır, Samsun, Van, Trabzon, Erzurum and Gaziantep, which have the highest population in the regions, according to the simple random sampling method (Figure 1). In determining the surveyed consumers, care was taken to take into account the socio-economic status (SES) of the consumers. The SES of consumers consisted of criteria such as occupation, education, income level, source of income, type of house lived in, the structure of the living environment, owned goods, and property (Parmaksız, 2016). In the surveys conducted especially in metropolitan cities such as Istanbul, Ankara and Izmir, utmost importance was given to conducting studies according to SES criteria.


**Figure 1.** Provinces where pasta consumers were surveyed

In determining the number of consumers surveyed, a simple random sampling method, which is frequently used in such research, was applied. The formula applied in the method is as follows (Güneş and Arıkan, 1988).

In the formula

n = Sample size

N = Population size

$\sigma^2$ px= Variance of the ratio

p = Proportion of people who consume pasta in the population (0.5) (when the sample size is unknown)

q=0.5 (1-p)

The population consisted of the population of the provinces included in the scope of the research and the number of surveys to be conducted in the research was calculated as 1,815 using a 99% confidence interval and a 3% margin of error. In the distribution of the questionnaires by province, the proportion of each province in the total population of the research area was taken into consideration (Table 1).

**Table 1.** Distribution of the number of consumer surveys by provinces

| Row | Province | Region | *Total Region Population (2016) | The rate in target provinces | Ratio to TR population | n | % |
|---|---|---|---|---|---|---|---|
| 1 | İstanbul | Marmara | 14,804,116 | 43.18 | 18.55 | 784 | 43.18 |
| 2 | Ankara | Central Anatolia | 5,346,518 | 15.59 | 6.7 | 283 | 15.59 |
| 3 | İzmir | Aegean | 4,223,545 | 12.32 | 5.29 | 224 | 12.32 |
| 4 | Antalya | Mediterranean | 2,328,555 | 6.79 | 2.92 | 123 | 6.79 |
| 5 | Diyarbakır | Southeast Anatolia | 1,673,119 | 4.88 | 2.1 | 89 | 4.88 |
| 6 | Samsun | Central Black Sea | 1,295,927 | 3.78 | 1.62 | 69 | 3.78 |
| 7 | Van | Eastern Anatolia | 1,100,190 | 3.21 | 1.38 | 58 | 3.21 |
| 8 | Trabzon | Eastern Black Sea | 779,379 | 2.27 | 0.98 | 41 | 2.27 |
| 9 | Erzurum | Eastern Anatolia | 762,021 | 2.22 | 0.95 | 40 | 2.22 |
| 10 | Gaziantep | Southeast Anatolia | 1,974,244 | 5.76 | 2.47 | 105 | 5.76 |
| *Total target provinces* | | | *34,287,614* | *100.00* | *42.96* | *1,815* | *100* |
| *TR total* | | | *79,814,871* | *42.96* | | | |

*Source: Turkish Statistical Institute (2016), (Access Date: 17.03.2023)

In this study, the effects of demographic characteristics of consumers on pasta consumption habits were analyzed and consumer decisions were discussed comparatively by income groups. For this purpose, basic statistical methods were used to determine the relationships.

## RESULTS and DISCUSSION

The distribution of respondents according to demographic characteristics is shown in Table 2. Consumers in different age groups categorized as under 30, 31-45, and over 46 were interviewed. Of the 1,830 consumers interviewed, 41.3% were in the 31-45 age range (n=755), 38.6% were under 30 (n=706), and 20.2% were 46 and over (n=369).

**Table 2.** Distribution of respondents according to age groups

| Age Groups | n | % |
|---|---|---|
| Under 30 years of age | 706 | 38.6 |
| 31-45 | 755 | 41.3 |
| 46 and over | 369 | 20.2 |
| *Total* | *1,830* | *100.0* |

The age of the respondents ranged between 18 and 79, with an average age of 36.7 years. 79.7% of the individuals were women and 20.3% were men.

Among the surveyed individuals, high school graduates had the highest share with 33.2%, while illiterate individuals had the lowest share with 1.0%. The share of individuals with university education and above was 27.4% (Table 3).

**Table 3.** Distribution of respondents according to educational level

| Level of Education | n | % |
|---|---|---|
| Illiterate | 19 | 1.0 |
| Literate (no formal education) | 48 | 2.6 |
| Primary education | 443 | 24.2 |
| High school | 607 | 33.2 |
| High School | 213 | 11.6 |
| University | 455 | 24.9 |
| Postgraduate | 45 | 2.5 |
| *Total* | *1,830* | *100.0* |

The occupational groups of the respondents were evaluated under 9 categories (Table 4). Of the respondents, 38.4% were housewives, 17.4% were civil servants and 16.0% were workers.

**Table 4.** Distribution of respondents according to occupational groups

| Profession Group | n | % |
|---|---|---|
| Housewife | 702 | 38.4 |
| Officer | 319 | 17.4 |
| Self-employment | 100 | 5.5 |
| Retired | 88 | 4.8 |
| Unemployed | 116 | 6.3 |
| Trader-craftsman-businessman | 63 | 3.4 |
| Worker | 292 | 16.0 |
| Farmer | 5 | 0.3 |
| Other | 145 | 7.9 |
| *Total* | *1,830* | *100.0* |

Among the individuals who participated in the survey, individuals with a monthly income of 2,001-3,000 TL ranked first with 37.6%, while individuals with a monthly income of 3,001-4,000 TL ranked second with 26.3%. The highest income group, individuals with a monthly income of 10,000 TL and above, had a share of 1.3% (Table 5).

**Table 5.** Distribution of respondents according to income groups

| Income Groups | n | % |
|---|---|---|
| 1-1,000 | 13 | 0.7 |
| 1,001-2,000 | 226 | 12.3 |
| 2,001-3,000 | 687 | 37.5 |
| 3,001-4,000 | 482 | 26.3 |
| 4,001-5,000 | 221 | 12.1 |
| 5,001-7,500 | 135 | 7.4 |
| 7,501-10,000 | 43 | 2.3 |
| 10,001-+ | 23 | 1.3 |
| *Total* | *1,830* | *100.0* |

**Pasta consumption habits**

Of the interviewed consumers, 42.5% stated that they went shopping for general food at least once a week, 25.5% every 15 days, and 16.8% once a month or less. It was determined that 15.1% of the consumers did not have a specific time period for general food buying. Of the consumers whose pasta buying frequency was measured; it was determined that 30.2% of the consumers bought pasta at least once a week, 28.0% bought pasta every 15 days, 18.5% shopped pasta once a month or less, while 23.3% did not have a specific period for buying pasta. Consumers bought an average of 3.68 pieces of 500-gram pasta packages every time they bought for pasta. This amount corresponded to 1.84 kg of pasta (Table 6).

**Table 6.** The frequency of food and pasta buying in households

| | At least once a week | | Every 15 days | | Once a month or less | | No specific period | | How many packages of pasta do you buy on average (500 g package) |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | |
| General food buying | 777 | 42.5 | 467 | 25.5 | 308 | 16.8 | 277 | 15.1 | |
| Buying for pasta | 552 | 30.2 | 512 | 28.0 | 338 | 18.5 | 426 | 23.3 | 3.68 |

It was determined that 45.8% of the households consumed an average of 4-6 packages of 500-gram pasta packages in a month, 28.9% consumed 7 packages or more, and 25.3% consumed 1-3 packages of pasta. With this research, monthly pasta consumption per household in Türkiye was determined as 5.54 packages (Table 7).

**Table 7.** Monthly pasta consumption per household (500 g / Package)

| | n | % | Average |
|---|---|---|---|
| 1-3 package | 462 | 25.3 | 5.54 Package |
| 4-6 package | 839 | 45.8 | |
| 7 and more | 528 | 28.9 | |
| *Total* | *1,829* | *100.0* | |

The average household size of the consumers participating in the research was determined as 2.78 people. The number of adults over 18 years of age was 2.34 and the number of people under 18 years of age was 1.44. The average pasta consumption per person was calculated as 1.99 packages (500 g) per month and 23.9 packages (500 g) per year. In line with these results, the monthly pasta consumption per person was 0.995 kg and the annual pasta consumption per person was 11.94 kg.

Since pasta has a long shelf life, it increases the availability of stock in homes. In the research, it was determined that 64.1% of the consumers kept an average of 2.18 pieces (500 gr/pack) of pasta in their homes for use in case of need, and it was seen that consumers living in Erzurum province were the consumers who stocked the most pasta with 3.41 packages (500 gr).

The frequency of pasta consumption in the households of the individuals participating in the survey is shown in Table 8. In the survey area, 0.1% of the households consumed pasta every day. Pasta was consumed once a week in 37.3% of households, 2-3 times a week in 36.0% of households and once in 15 days in 15.5% of households. The rate of households consuming pasta less than once a month was 2.0%. In a study conducted with individuals over the age of 15 in Italy, where pasta is consumed the most, it was reported that 56.1% of individuals consumed pasta almost every day (4 or more times a week) and that pasta remained a staple in the daily meal (Altamore et al., 2020).

**Table 8.** Frequency of pasta consumption in households (units)

| | n | % |
|---|---|---|
| Every day | 1 | 0.1 |
| 4-5 Times a week | 99 | 5.4 |
| 2-3 Times a week | 658 | 36.0 |
| Once a week | 683 | 37.3 |
| 1 time in 15 days | 284 | 15.5 |
| Once a month | 69 | 3.8 |
| Less often than once a month | 36 | 2.0 |
| *Total* | *1,830* | *100.0* |

The fact that pasta is a food that can be prepared quickly ranked first among the reasons why consumers preferred pasta (Table 9). In addition, being a cheap foodstuff, being used on all kinds of menus, being liked by children, and being seen as a healthy food were the other factors that came to the forefront in consumers' preference for pasta.

**Table 9.** Reasons why consumers prefer pasta

| | % | Row |
|---|---|---|
| Quick preparation | 34.1 | 1 |
| Being a cheap food | 26.2 | 2 |
| Use in all types of menus | 16.2 | 3 |
| Children like it | 15.4 | 4 |
| Being a healthy food | 8.1 | 5 |
| Total | 100.0 | - |

It was determined that 42.1% of the consumers participating in the survey had a change in the amount of pasta consumption in the last 5 years, 62.7% of this change was in the direction of increasing the amount of pasta consumption and 32.3% was in the direction of decreasing the amount of pasta consumption. The rate of consumers who stated that there was no change in the amount of pasta consumption in the last 5 years was 57.9%. Among the reasons for the increase in pasta consumption among consumers who increased the amount of pasta consumption; economic reasons were in first place with a rate of 31.2% since pasta was cheap food. The fact that pasta was a food that can be prepared and served quickly ranked second with a rate of 23.0%. This can be considered as a result of the fact that family members cannot find enough time for food preparation and presentation due to the increase in migration from rural to urban areas and the change in social life. It was seen that criteria such as population increase in households, perception of pasta as a satisfying food, changes and developments in sauce culture, introduction of new pasta varieties, media influence and health reasons caused consumers to increase their pasta consumption (Table 10). In a study conducted in Italy in 2020, it was stated that pasta was consumed more in families with more members; in other words, the larger the nuclear family, the more pasta was consumed (Altamore et al.2020). They emphasized that with this choice, the family could meet both nutritional and taste needs in one meal with budget control.

**Table 10.** Reasons for consumers to increase the amount of pasta consumption

| | % | Row |
|---|---|---|
| Economic reasons | 31.2 | 1 |
| Quick to prepare | 23.0 | 2 |
| Household population increase | 16.1 | 3 |
| Being a satisfying food | 11.0 | 4 |
| The influence of sauce culture | 9.2 | 5 |
| Increase in pasta varieties | 7.1 | 6 |
| Impact of the media | 1.2 | 7 |
| Health reasons | 1.2 | 8 |
| *Total* | *100.0* | - |

Health (34.0%) and household depopulation (33.0%) were the main reasons for consumers to reduce their pasta consumption (Table 11). Keeping fit, economic reasons and being influenced by the media were also listed as other reasons for consumers to reduce pasta consumption (Table 11). In a study, it was stated that pasta consumption in Türkiye was far below the average consumption in European countries. The reason for this was that pasta could not find its desired place in Turkish kitchens due to its misrecognition as a fattening product (Turhan, 2008). In a study conducted, it was stated that 67.2% of individuals had the perception that pasta caused weight gain (Muslu et al., 2021).

**Table 11.** Reasons for consumers to reduce the amount of pasta consumption

| | % | Row |
|---|---|---|
| Health reasons | 34.0 | 1 |
| Household depopulation | 33.0 | 2 |
| In order to keep fit | 22.0 | 3 |
| Economic reasons | 6.0 | 4 |
| Impact of the media | 5.0 | 5 |
| *Total* | *100.0* | - |

30% of consumers thought that there was a positive change in the quality of pasta varieties in the last 5 years. In terms of positive changes, 36.0% of the consumers stated that the variety of pasta varieties increased, 28.0% stated that the taste increased, 18.0% stated that the pasta cooked better than before and 18.0% stated that the appearance of the pasta improved (Table 12).

**Table 12.** Positive changes in the quality of pasta varieties in the last 5 years

| | **%** |
|---|---|
| Increase in varieties | 36.0 |
| Increased flavor | 28.0 |
| Better cooking | 18.0 |
| Improved appearance | 18.0 |
| *Total* | *100.0* |

12.6% of the consumers thought that there was a negative change in the quality of pasta varieties in the last 5 years. These negative changes were expressed by 46.0% of the consumers as the use of additives in pasta production, 25.0% as the taste not being the same as before, and 16.0% as not being cooked as well as before. The other option, which was answered by 13.0% of the consumers, was 61.0% due to the increase in pasta prices (Table 13).

**Table 13.** Reasons for the negative changes in the quality of pasta varieties in the last 5 years

| | | % |
|---|---|---|
| Suspicion of additives | | 46.0 |
| Thinking that the flavor is not the same as before | | 25.0 |
| Thinking that it is not cooked well | | 16.0 |
| Other | | 13.0 |
| • Increasing prices | % 61.0 | |
| • Decreased quality | % 31.0 | |
| • Thinking that it causes weight gain | % 8.0 | |

The cooking properties, textural properties and sensory properties of pasta are important parameters affecting consumer preferences (Özgören, 2019). In this study, the taste and flavor of pasta ranked first among the criteria for consumers' evaluation of pasta quality with a rate of 29.0%. Cooking time, doughification, color and turbidity of the cooking water were also prioritized by consumers as quality criteria for pasta (Table 14).

**Table 14.** Consumers' criteria for evaluating pasta quality

| | % |
|---|---|
| Flavor/taste | 29.0 |
| Cooking time | 25.0 |
| Doughification (over cooked) | 24.0 |
| Color | 11.0 |
| Turbidity in the cooking water | 10.0 |
| Other | 1.0 |
| *Total* | *100.0* |

Pasta was perceived as an unhealthy food by 53.4% of the surveyed consumers, while on the contrary, it was perceived as a healthy food by 46.6%. Consumers listed the reasons for perceiving pasta as a portion of healthy food as it gave a feeling of fullness and energy, it was a natural food and rich in vitamins and minerals and it lowered cholesterol (Table 15).

**Table 15.** Reasons why consumers perceive pasta as a healthy food

| | % |
|---|---|
| Feeling of satiety | 32.0 |
| Providing energy | 31.0 |
| Being a natural food | 24.0 |
| Rich in vitamins and minerals | 12.0 |
| Lowering cholesterol | 2.0 |
| *Total* | *100.0* |

Among consumers who did not characterize pasta as a healthy food, 50% stated that pasta was a food that caused weight gain. The perception of pasta as an unhealthy food was caused by the belief that it caused diseases such as cholesterol and diabetes, contained additives and was difficult to digest (Table 16).

**Table 16**. Reasons why consumers do not perceive pasta as a healthy food

| | % |
|---|---|
| Weight gain | 50.0 |
| Causes diseases like cholesterol and diabetes | 22.0 |
| Contains additives | 14.0 |
| Difficult digestion | 14.0 |
| *Total* | *100.0* |

Price perception has an important place in consumers' product selection and purchasing behavior (Ene & Özkaya, 2013). In this study, while the price of the pasta to be purchased ranked first among the criteria that consumers attached importance to when purchasing pasta with a rate of 28.0%, the quality ranked second (24.0%) and the brand ranked third (22.0%). The shape of the pasta, egg, vegetable, bran, whole wheat and vitamin-added pasta were listed as other criteria that consumers considered when purchasing pasta. Consumers mostly preferred brands they knew and recognized in their brand preferences. For this reason, a well-known brand may be preferred more than an unknown brand in consumer preferences. The fact that a brand is familiar (known) to the consumer was very important in terms of entering the consumer's evaluation cluster. Therefore, brand awareness was very effective in the consumer purchasing process (Deniz, 2012).

It was shown that when it came to buying pasta and determining which brand to buy, 53.4% of consumers thought about buying pasta on their shopping list before beginning general food shopping, while 46.6% of them decided to buy pasta while shopping. The process of deciding on the brand of pasta to be purchased started before shopping for 38.1% of the consumers, while 61.9% of them decided during shopping. According to these results, while the decision to purchase pasta for consumers was determinant both before and during shopping at close rates, the fact that the brand preference decision was mostly concrete during shopping can be evaluated as brand loyalty was not determinant for pasta consumers.

It was seen that 63.5% of the consumers can buy another pasta brand if the brand they regularly buy was not available in the market, 24.5% of them can go to other markets to find and buy pasta of the brand they consumed, and 12.0% of them gave up buying pasta if they cannot find it. These results can be evaluated as 63.5% of the consumers did not have brand loyalty in pasta consumption. When we look at the process of the formation of a brand and the formation of the image of the brand; first and foremost was the clear positioning of the brand in the consumer's mind. Advertising determines the course and speed of this process. In addition to achieving the ultimate goal expected from advertising, the applications made for the brand by taking into account the attitude levels, habits and expectations of consumers will also facilitate the positioning of the brand (Çakar, 2007).

Many factors can play a role in the consumer's choice of pasta brand. Among these factors, the taste of pasta ranked first with a share of 34.0%, followed by its quality (21.0%) and the brand that the consumer was used to consuming (13.0%). The ubiquity and variety of the preferred pasta brand and its packaging each accounted for 2.0% (Table 17). Pasta is a good source of carbohydrates. However, although pasta contains 11-15% protein, it is poor in lysine and threonine amino acids as in other cereal products. To increase the nutritional value of pasta, it has been enriched with vegetable sources such as legumes (Petitot et al., 2010). Consumers may use different variables to determine the quality of a product, and this perception of quality varies according to the perspective of the consumers in question. Many consumers may use price as an indicator of product quality (Kotler et al., 2001). In the study on consumer perception of product quality, it was emphasized that there was a relationship between price, value and product quality and that price itself was a strong indicator of product quality in the absence of any information (Agyekum et al., 2015)

**Table 17.** Prominent factors in pasta brand preference

| | **%** |
|---|---|
| Taste | 34.0 |
| Quality | 21.0 |
| Being a familiar brand | 13.0 |
| Low price | 12.0 |
| Does not disintegrate when cooked | 8.0 |
| Cooks quickly | 4.0 |
| A ubiquitous brand | 2.0 |
| Having many varieties | 2.0 |
| Packaging | 2.0 |
| *Total* | *100.0* |

In 2021, a study on the addition of fiber to pasta within the scope of consumer preferences in the pasta sector, identified consumer segments as four consumer groups: quality-oriented, sensory-oriented, convenience-oriented and neutral consumers based on their pasta selection desires (Sajdakowska et al., 2021). They examined the differences between the defined segments in terms of their perception of pasta and pasta with added fiber and their level of knowledge about pasta. As a result of the analysis, they determined that the quality-oriented group was the group with the most positive opinion about the addition of fiber to pasta.

While the rate of consumers who preferred domestic brands in pasta consumption was 53.7%, the rate of consumers who stated that they did not pay attention to whether it was a domestic or foreign brand was determined as 37.3%. The rate of those who preferred both domestic and foreign brands of pasta was found to be 7.4%, while the rate of producers who preferred only foreign brands was found to be 1.6%.

In today's world where pasta shapes vary, 54.6% of consumers did not attach importance to a pasta shape, while 45.4% attached importance to pasta shape. It was thought that this importance may be due to the recipes that can be prepared with different pasta shapes and consumers prefer the pasta shape suitable for the recipe.

Spaghetti (29.5%), butterfly (farfalle) (17.6%), and twist (fusilli) (17.1%) were the most preferred pasta shapes by consumers, followed by round butterflies (farfalle tonde) and bead (ditalini rigate) pasta shapes. The rate of consumer preference for pasta with letters and figures, which was thought to be of more interest to children in recent years, was determined to be only 0.9%. The reasons for the last place in the preference may be the deformation of the shapes of letter and figure pasta during cooking and the fact that it has not yet become a habit.

Among the print and broadcast media publications on pasta and bulgur consumption followed by consumers in the last two years, TV cooking programs stand out. This was followed by TV health programs and print media, respectively. In general, 66.8% of consumers followed TV programs and 14.6% followed print media. In 2020, as a result of a study on the content of health programs and cooking competitions broadcast on TV and social media; it was thought that presenting scientific information about human health in health programs based on scientific sources and in an entertaining format, and including information in cooking programs would increase the interest and awareness of the society in healthy nutrition (Umunç, 2020).

While 49.9% of the consumers stated that the programs they follow did not affect their attitudes toward pasta consumption, 10.5% stated that they did. On the other hand, 39.6% of the consumers stated that the programs they follow did not have a positive or negative effect.

In the study conducted, when consumers were asked about their opinions on the ingredients used in pasta production, 65.9% of the consumers who answered the question stated that pasta was made from flour, 14.4% stated that pasta was made from semolina, and 8.1% stated that they had no information about the ingredients used in pasta production. Another 2.3% of the surveyed consumers stated that they thought that additives were used in pasta making. In Türkiye, it is generally thought that the raw material of pasta is flour. It can be said that the reason for this idea stems from erişte (Turkish noodles), which is a traditional food. Erişte, a pasta-like product, is produced by using hard and soft wheat flour. Although traditional erişte production in Türkiye varies according to region, it is made by rolling out the dough kneaded with flour, water, salt, and eggs in some regions, cutting it into different shapes and drying it. Milk, whey, or other additives can also be used to produce erişte (Emeksizoğlu, 2016). Pasta, on the other hand, is a product obtained by kneading water and semolina obtained by grinding durum wheat and drying it after giving the desired shapes according to the Turkish Food Codex Pasta Communiqué. There are three types of pasta called plain, whole wheat, and seasoned. According to this Communiqué, these three types of pasta must be produced from semolina obtained from durum wheat (Anonymous, 2002). However, to increase competition in pasta exports to African countries, Iraq, Syria, Lebanon, Jordan and South American countries, it is allowed to use up to 100% bread wheat flour in pasta to be exported (Anonymous, 2016). In domestic consumption, the use of bread wheat in pasta is prohibited according to the Turkish Food Codex. Durum wheat is the most suitable raw material for semolina and pasta production. The reason for this is that durum wheat contains higher protein content, lower lipoxygenase enzyme activity and a higher amount of color pigments that give yellow color to pasta compared to bread wheat (Aalami et al., 2007). In addition, durum wheat has a higher semolina yield than bread wheat because it usually has a very hard glassy endosperm, making it easier to form semolina.

Pasta, which is preferred by consumers due to its practicality, is cheap and can be included in all kinds of menus, is consumed at lunch, snack and dinner. It was determined that 65.9% of the surveyed consumers preferred it for dinner. The rate of those who consumed pasta at lunch was 21.1% and the rate of those who consumed it as a snack was 11.4%. In a study conducted in 2007, it was reported that 62.2% of consumers consumed pasta with the main meal, 19.4% as a single meal and 18.4% as both (Yurtsever 2007).

39.2% of the consumers stated that they consumed pasta when there was an urgent need to cook and 20% stated that they consumed pasta with main meals. Among the factors affecting the inclusion of pasta in the menu at home, children's desire to eat pasta was also included to a great extent (17.1%) (Table 18).

**Table 18.** On which occasions do consumers usually consume pasta

| | N* | % |
|---|---|---|
| In case of an urgent need to cook | 1.382 | 39.2 |
| With other main dishes (meat. chicken. fish) | 706 | 20.0 |
| When children want to eat pasta | 604 | 17.1 |
| At regular intervals (such as every 3 days. or once a week) | 488 | 13.8 |
| When a guest comes | 330 | 9.4 |
| Other | 19 | 0.5 |
| *Total* | *3.529* | *100.00* |

* Marked more than one option

In recent years, there are many pasta varieties in the market such as whole wheat, bran, vitamin, vegetable as well as classic pasta. However, it requires a certain time for these new varieties to take place in consumer habits. When consumers were asked whether they tried these different varieties and how often they consumed them, 72.0% of them stated that they never consumed bran and vitamin pasta, and 62.0% stated that they never consumed vegetable pasta (Table 19).

**Table 19.** Consumers' consumption of different types of pasta

| | Whole Wheat | | Bran | | With vitamins | | With Vegetables | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| I've only tried it once. | 146 | 8.0 | 157 | 8.6 | 103 | 5.6 | 177 | 9.7 |
| Every day | 10 | 0.5 | 4 | 0.2 | 7 | 0.4 | 8 | 0.4 |
| Once a week | 308 | 16.8 | 40 | 2.2 | 51 | 2.8 | 59 | 3.2 |
| More often than once a week | 167 | 9.1 | 22 | 1.2 | 37 | 2.0 | 31 | 1.7 |
| Every fifteen days | 162 | 8.9 | 79 | 4.3 | 116 | 6.3 | 151 | 8.3 |
| Once a month or less | 225 | 12.3 | 209 | 11.4 | 199 | 10.9 | 270 | 14.8 |
| Never consumed | 812 | 44.4 | 1.319 | 72.1 | 1.317 | 72.0 | 1.134 | 62.0 |
| Total | 1,830 | 100.0 | 1,830 | 100.0 | 1,830 | 100.0 | 1,830 | 100.0 |

It was emphasized that there should be industrial targets in the production of pasta with high nutritional value and low glycemic index value, taking into account certain consumer categories such as celiac patients and type 2 diabetes patients (Di Pede et al., 2021). Today, food has become an important component of a healthy life. Especially environmentally friendly production techniques related to the origin of products and human health will be increasingly taken into account by consumers (Ingrassia et al., 2017).

In the study, consumers' consumption of gluten-free pasta was also examined. Among the consumers surveyed, 97.8% stated that there were no individuals in their households who consumed gluten-free pasta, while 9.7% of the individuals who consumed gluten-free pasta stated that they could easily find gluten-free pasta in the market and 51.3% stated that they could not find it. While 36.6% of those who consumed gluten-free pasta stated that they found the prices very expensive, 31.7% found them expensive, and 29.3% of consumers did not think that they were cheap or expensive (Table 20).

**Table 20**. Consumers' opinions on gluten-free pasta prices

| | n | % |
|---|---|---|
| Very cheap | 1 | 2.4 |
| Neither cheap nor expensive | 12 | 29.3 |
| Expensive | 13 | 31.7 |
| Very expensive | 15 | 36.6 |
| *Total* | *41* | *100.0* |

Pasta, which is the most consumed food after bread among bakery products, is a product that is consumed by individuals from all age groups (Özgören and Yapar, 2015). In this study, the liking of pasta consumption was investigated according to age groups in 2 categories: under 18 years of age and over 18 years of age. When the pasta consumption liking status of individuals under the age of 18 in their households was examined, the rate of liking pasta consumption was 87.6% in the 6-10 age range and 86.8% in the 11-15 age range. Under the age of 18, it was determined that individuals between the ages of 6-15 liked pasta consumption the most (Table 21). The average of 86.9% of individuals under 18 years of age who liked pasta consumption was calculated as 86.9%. According to these results, it can be said that pasta was a food that was liked and consumed by almost every age group of individuals under the age of 18.

**Table 21.** Pasta consumption liking status under the age of 18

| Age range | Yes | | No | | Total |
|---|---|---|---|---|---|
| | n | % | n | % | |
| 1-5 | 175 | 87.9 | 24 | 12.1 | 199 |
| 6-10 | 290 | 87.6 | 41 | 12.4 | 331 |
| 11-15 | 264 | 86.8 | 40 | 13.2 | 304 |
| 16-18 | 146 | 84.4 | 27 | 15.6 | 173 |
| *Average* | *875* | *86.9* | *132* | *13.1* | *1.007* |

It was seen that the age group that liked to consume pasta the most among the individuals over the age of 18 in the households of the consumers participating in the research was the 31-40 age group, followed by the 41-50 age group and the 51+ age group, respectively. In general, 85.2% of individuals over the age of 18 liked to consume pasta. When the results of all age groups in households were evaluated, it was revealed that 85.0% of individuals under and over the age of 18 liked to consume pasta (Table 22).

**Table 22.** Pasta consumption liking status over the age of 18

| Age range | Yes | | No | | Total |
|---|---|---|---|---|---|
| | n | % | n | % | |
| 19-25 | 587 | 87.9 | 81 | 12.1 | 668 |
| 26-30 | 535 | 86.2 | 86 | 13.8 | 621 |
| 31-40 | 807 | 83.1 | 164 | 16.9 | 971 |
| 41-50 | 705 | 86.7 | 108 | 13.3 | 813 |
| 51+ | 641 | 83.0 | 131 | 17.0 | 772 |
| *Average* | *3.275* | *85.2* | *570* | *14.8* | *3.845* |

## Conclusion

It is a well-known fact that wheat has an important place in the world as human food. Today, as in every field, the focus is on sustainability and global health in nutrition. Adequate and balanced nutrition is one of the basic principles of sustainable nutrition. Pasta, a wheat product, is seen as a good source of carbohydrates and energy in sustainable nutrition models. It is even a staple in the Mediterranean diet and at the base of the food pyramid. It is also a popular food with the advantage of global consumption.

In recent years, it has been observed that the consumption consciousness of consumers has shifted towards a healthier diet rather than meeting their nutritional needs. Considering the nutritional elements contained in durum wheat, it can be seen that it is a food that should be included in a healthy diet.

Pasta also has an important place in Turkish cuisine and the results of the research have proved again that it is a food that is consumed fondly by every age group. It is one of the rare foods cooked in every household for centuries.

The fact that a large proportion of consumers have increased their pasta consumption in the last 5 years due to economic reasons, quick preparation, increase in household population, being filling, sauce culture and increase in varieties is an indication that this amount will tend to increase in the future. Some consumers think that pasta consists of 'flour and dough' and contains additives. The prevalence of this information is a barrier to pasta consumption. At the same time, the perception that 'it causes weight gain and is unhealthy' stands out as a reason for giving up pasta consumption. Therefore, promoting pasta with its differentiating content from other floury products, and its nutritional and health aspects may be a trigger for increased consumption. It is necessary to eliminate misinformation and perceptions among consumers and to prepare information and awareness-raising policies on healthy nutrition and nutrients. It is recommended that these studies should be implemented together with relevant institutions, organizations, private sector and non-governmental organizations and joint activities should be carried out. Considering the interest of consumers in TV cooking programs in the last two years, more emphasis should be placed on visual media.

It is seen that sauces come to the forefront in countries where pasta is consumed the most. Developing and recommending sauces suitable for the taste of consumers in Türkiye may be one of the ways to increase pasta consumption.

Especially in recent years, to increase the nutritional value of pasta and to improve its functional properties, pasta varieties such as vitamins, vegetables, bran and whole wheat pasta are offered to the market by adding vegetable and animal raw materials. Considering that the awareness and consumption of these pasta varieties are very low in Türkiye, it can be suggested to focus on promotion and promotion activities. Considering that the first feature that consumers look for in pasta quality is taste, it is important to determine the types and quantities of raw materials to be used in pasta in accordance with the traditional taste and preference of consumers and to focus on research to be conducted on this subject.

**Acknowledgments**

This study utilized the data obtained from the project titled "Competitive Analysis of Pasta Sector in Türkiye" numbered TAGEM/TEPAD/Ü/18/A8/P1/1417 supported by the Ministry of Agriculture and Forestry, General Directorate of Agricultural Research and Policies.

Conflict of Interest Statement: The authors declare that there is no conflict of interest between them.

Summary of Contribution Ratio of Researchers: In the research, the order of authors according to "Contribution Rate" was followed.

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