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# INVESTIGATION OF MACRO-MICRO NUTRIENT COMPOSITIONS OF STREET FOOD OF ADANA PROVINCE

## Adana İli Sokak Yemeklerinin Makro-Mikro Besin Bileşimlerinin Araştırılması

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## Abstract

Street food varies in nutritional value and significantly affects food intake in many populations worldwide. The street food sector includes beverages and foods suitable for fast consumption, which are prepared and sold by peddlers or kiosks in public areas, especially on the streets. In this study, the macro and micro nutrients of 10 street foods that are frequently preferred in Adana were examined using the BeBIS 7.2 program. All selected street foods differed significantly in macronutrients. Adana Wrap was found to be the food with the highest energy content and saturated fat content for one serving, while Liver was found to be the dish with the highest protein, vitamin A and iron content. Beverages are the product with the least energy content of street food. Of the desserts, Burma has the most energy. There are many types of street food in Adana and frequently preferred products are included in this study. Street food should be developed and enriched in terms of nutritional content, as it is a fast and economical meal that is frequently preferred by individuals. Although there are many studies evaluating the gastronomic aspect of street food in Turkey, there is no study evaluating the nutritional elements. This study has a unique value as it is the first study to evaluate street food in terms of macro and micro nutrients. In addition, the evaluation of street food in terms of food safety in future studies will contribute to the literature.

**Key words:** Street food, Local foods, Nutritional Composition, Local Beverages

## Öz

Sokak gıdalarının besin değeri farklıdır ve dünya çapında birçok popülasyonda gıda alımını önemli ölçüde etkilemektedir. Sokak yemeği sektörü, sokaklar başta olmak üzere halka açık alanlarda seyyar satıcı veya büfelerde hazırlanıp satılan, hızlı tüketime uygun içecek ve yiyecekleri içermektedir. Bu çalışmada Adana'da sıklıkla tercih edilen 10 sokak yemeğinin makro ve mikro besin değerleri BeBIS 7.2 programı kullanılarak incelenmiştir. Seçilen tüm sokak yiyecekleri, makro besinler açısından önemli ölçüde farklılık göstermektedir. Bir porsiyonda enerji ve doymuş yağ oranı en yüksek yemeğin Adana Dürüm olduğu, protein, A vitamini ve demir içeriği en yüksek yemeğin ise Ciğer olduğu tespit edilmiştir. İçecekler, sokak yiyecekleri arasında en az enerji içeren ürünlerdir. Tatlılar arasında en fazla enerjiye sahip olan Burma'dır. Adana'da birçok sokak yemeği çeşidi bulunmakta ve sıklıkla tercih edilen ürünler bu çalışmada yer almaktadır. Sokak yemekleri bireyler tarafından sıklıkla tercih edilen hızlı ve ekonomik bir yemekler olduğu için besin içeriği açısından geliştirilmeli ve zenginleştirilmelidir. Türkiye'de sokak yemeklerinin gastronomik yönünü değerlendiren birçok çalışma olmasına rağmen besin ögelerini değerlendiren bir çalışma bulunmamaktadır. Bu çalışma, sokak yemeklerini makro ve mikro besinler açısından değerlendiren ilk çalışma olması nedeniyle benzersiz bir değere sahiptir. Ayrıca ileride yapılacak çalışmalarda sokak gıdalarının gıda güvenliği açısından değerlendirilmesi literatüre katkı sağlayacaktır.

**Anahtar kelimeler:** Sokak yemekleri, Yerel yiyecekler, Besin Bileşimi, Yerel İçecekler

## Introduction

Today, as in many areas of life, globalization causes differences in people's food consumption habits. Variable social profiles and the intense participation of women in working life have caused visible changes in the country's economy, which is reflected in food and beverage culture. Therefore, in recent years, people in developing countries have spent most of their income on food. This has turned street food into an alternative sources of nutrition (Sanlier et al., 2018). It is estimated that low-budget street food is consumed by 2.5 billion people worldwide every day (Steyn and Labadarios, 2011).

Street food allows people living in a city to create a balanced meal combination at a low cost (Privitera and Nesci, 2015). Additionly, it is estimated that street food sold by vendors accounts for 40% of the daily diet of urban consumers in developing countries. Street food is usually sold at a stand, cart, or kiosk in crowded public areas such as sidewalks, school buildings, beaches, and train and bus stations (Steyn and Labadarios, 2011).

Selling food on streets around the world is a common lifestyle. In many countries, street vendors take their place on the streets with a variety of products; including snacks, drinks, and meals. While street food provides affordable food to millions of consumers, it is also an important source of income for vendors (Kok, 2014).

Street food consists of both modern and traditional foods (Privitera and Nesci, 2015). From Mexican taco stands to New York City's hot dog carts, ready-to-eat street food is readily available. Street food is a common culture of city life in many countries. Kebab in Turkey, taco in Mexico, takoyaki in Japan, and samosa in India are the most popular national street foods, and these foods are found on almost every street of the country (Choi et al., 2013).

**Hygiene, Quality and Safety Dimensions of Street Foods**

With the increase in demand for street flavors, food-borne diseases incur individual and social economic costs. Therefore, food safety practices regarding food sold on the street have become an important priority for the public and governments (Solunoglu and Nazik, 2018). Inappropriate production methods and storage conditions for street food and non-compliance with hygiene rules by vendors have led to the emergence of diseases related to street food (Akindobe et al., 2011).

Factors such as a lack of sanitation in the sales area, contaminated containers, and untreated water used by street food vendors cause the transmission of pathogens to people through food (Das et al., 2010). Contamination of with pathogenic microorganisms can cause various foodborne diseases. Inadequate temperature application in the production of street foods and storage of foods in inappropriate conditions are among the reasons that may cause food-borne outbreaks (Kılıc and Girgin, 2021).

In this context, the World Health Organization and Food and Agriculture Organization have developed many programs to ensure the safety of street food. In these programs for street food; It is seen that he organizes training for street food vendors to increase food safety and hygiene and also makes informative publications (FAO, 2009; WHO, 2011; FAO/WHO, 2022).

**Street Foods Concept**

Street food is generally the food and drink sold on the streets and in similar places by peddlers or kiosks. It constitutes an important part of daily food consumption for millions of consumers with limited financial resources in urban life. Informing consumers about street food can be the cheapest way for low-income people to provide a balanced diet outside their homes, provided that they can choose food appropriately (FAO, 2021).

Street food is affordable and accessible to many. So, it is important to meet the nutritional needs of consumers and meeting their daily energy needs. It also plays an important role in reducing the poverty rate, which is the main cause of food insecurity, because it creates an economically important employment in cities (Namugumya and Muyanja, 2012). Street food is very diverse; ready-made foods that do not require cooking (such as salads made from vegetables and fruits, fresh fruit juices), foods that are pre-cooked and served to the sales place (burrito, chicken/chickpea rice, damascus dessert, licorice

sherbet etc.) and food which prepared and prepared in the sales area. food served (liver, bici bici, chestnut, etc.) (Malhotra, 2017).

**Street Foods in Turkey**

Turkish cuisine is among the richest cuisines in the world. Owing to its geographical location, it serves as a gateway between the east and west. Turkish cuisine has become a synthesis of the east and west societies thanks to the cultural heritage of the geography it lives in, Turkish traditions and interactions with different cultures (Talas, 2005). In Anatolian lands; The nomadic Turks who migrated from Central Asia, the first civilizations such as the Hittite, Byzantine, and Romans that ruled in Anatolia, and recently the Middle East, Iran, Jewish, Mediterranean, and Balkan cuisines have been blended (Irıgüler and Ozturk, 2016). Thanks to this synthesis, Turkish cuisine and street food, which is a sub-branch of this cuisine, reflect these cultures (Talas, 2005).

Street food consumption in Turkey is similar to many other countries in the World, and it shows diversity Çiğ köfte, simit, pastries, kokorec, meatball sandwiches, kebab, boiled corn in a bowl, boza, salep, chestnuts, liquoric root, and foods and beverages such as cotton candy, apple candy, and ice cream etc. (Steyn and Labadarios, 2011).

**Adana Street Foods**

Adana's historical and cultural heritage has important effects on the shaping of Adana culinary culture. Adana has a village and town culture due to internal migration, and different city cultures due to external migration. This situation causes Adana cuisine to be diverse and richness. Pastries, meat, and vegetable dishes are dominant in Adana cuisine. Sweeteners such as parsley, mint, red pepper, sumac, black pepper, cumin, ornamental pepper, thyme, pomegranate molasses, onion, and garlic, which can be consumed with meals, also play an important role in Adana cuisine.Because climatic conditions are suitable for spending time outside in all seasons, local people may prefer street food and drinks such as "Dürüm" and " Turnip" juice (Guzeler et al., 2016).

The diversity of street foods and the frequency of consumption by local people have led to the development of the existing street food culture in the region and the formation of a unique street food culture and habits. Each street food item is produced and sold on its own unique counter or table. Street food, which has become a 'concept' for eating and drinking in Adana today, has come to have features that can provide a special experience beyond offering delicious tastes to tourists coming to the region. Today, some of the flavors that are among the street foods and drinks unique to Adana, which can be brought to the fore in the touristic sense in recent years, can be listed as follows: Adana kebab, liver, şırdan, mumbar, kırkkat, flatbread, rolled pastry, turnip, aşlama, bicibici, halka dessert, burma dessert, stone kadayif, şam dessert, tulumba dessert, prickly pear etc. (Balli, 2016). Examining the factors affecting consumers' food choices and behavior towards gastronomy tourism during their travels, the development of gastronomy tourism is important for (Özer Altundağ, 2018). The aim of this study is to examine the contribution of street food consumption to the nutritional profiles of individuals and to

by determining the healthy nutrition aspect of their travels and informing relevant stakeholders to raise awareness and contribute to gastronomy tourism.

## Material and Methods

In this research, 10 street flavors are evaluated, which are among the street flavors that stand out in Adana, Adana Wrap, Adana Kebab, Liver, Squeeze, Flatbread, Bici Bici, Şam Dessert, Burma Dessert, Licorice Sherbet and Turnip juice (Salgam). In this context, the Provincial Ministry of Tourism, the Turkish Patent and Trademark Office and the Adana Culinary Art book, in which the recipes of street food are written, were used to examine and evaluate the macro and micro nutritional values of the most preferred foods and beverages in Adana. The quantity information obtained from the recipes was entered into the Nutrition Information System (BeBIS 7.2) program database and the amounts of macro and micro nutrients contained in a portion of the products were calculated. To carry out these analyses, the recipes of these 10 street foods were collected using the official web pages of Adana Provincial Ministry of Tourism, Turkish Patent and Trademark Institution, and Adana Culinary Art Book (Anonymous, 2011; Anonymous, 2021a; Anonymous, 2021b). The ingredients of the street delicacies examined in the study are listed in Table2, Table3 and Table 4.

The Turkey Nutrition Guide 2022 states that an adult should get 10-20% of his/her daily energy from proteins, 45-60% from carbohydrates and 20-35% from fats (TUBER, 2022). The nutrient values obtained in the study were compared with TUBER 2022 reference values. Table 1 gives the recommended daily nutrient values for adult men and women (TUBER, 2022).

**Tablo 1.** Recommended nutritional values for adult women and men

| **Nutrient Items** | **Women** | **Men** |
|---|---|---|
| **Energy (kcal)** | 1502-2551 | 1867- 3198 |
| **Carbohydrate (g/2000kcal)** | 225-300 | 225-300 |
| **Protein (g/kg)** | 0.83 | 0.83 |
| **Fat (g/2000kcal)** | 44-77 g | 44-77 g |
| **Pulp (fiber) (g)** | 25 | 25 |
| **Cholesterol (mg)** | 300 | 300 |
| **Saturated fatty acid (g)** | 4.4-7.7 | 4.4-7.7 |
| **Monounsaturated fatty acid (g)** | 6.6-11.5 | 6.6-11.5 |
| **Polyunsaturated fatty acid (g)** | 4.4-7.7 | 4.4-7.7 |
| **Vitamin A (mcg)** | 650 | 750 |
| **Vitamin C (mg)** | 95 | 110 |
| **Vitamin E (mg)** | 11 | 13 |
| **Vitamin $B_{12}$ (mcg)** | 4 | 4 |

| | | |
|---|---|---|
| **Potassium (mg)** | 3500 | 3500 |
| **Sodium (mg)** | 2 | 2 |
| **Iron (mg)** | 11-16 | 11 |
| **Calcium (mg)** | 950-1000 | 950-1000 |
| **Magnesium (mg)** | 300 | 350 |
| **Iodine (mcg)** | 150 | 150 |

(TUBER, 2022).

**Tablo 2.** Material List of Street Foods Examined in The Study

| **Adana Kebab (9 servings)** | **Liver (4 servings)** | **Adana Wrap (11 pieces)** | **Squeeze (8 servings)** | **Flatbread (8 servings)** |
|---|---|---|---|---|
| 150 g tail fat<br>1 kg of mutton<br>Salt<br>Red powdered pepper<br>red root pepper | 500 g liver<br>125 g tail fat<br>salt, cumin | 1 kg of wheat flour<br>600 g of water<br>25 g of salt<br>Margarine<br>Inner filling:<br>1210 g full fat fresh feta cheese | 750 gr flour<br>1 teaspoon of salt<br>enough water<br>30g butter<br>Internal fee;<br>2 onions<br>500 g fatty cheese<br>Half a bunch of parsley<br>Red pepper | 1 kg of flour<br>1 teaspoon of yeast<br>55 g of oil<br>Salt<br>as much water as it takes<br>Internal fee:<br>500 g minced meat<br>250 g onion<br>Black pepper, paprika, salt<br>1 bunch of parsley |

**Table 3.** Material List of Street Desserts Examined in The Study

| **Bici Bici (4 servings)** | **Şam Dessert (27 pieces)** | **Burma Dessert (32 pieces)** |
|---|---|---|
| 25 g corn starch | 1 glass of sugar | 1 kg of flour |
| 250 ml of water | 1 glass of water Milk | 200 ml of milk |
| 0.8g vanilla | 1 cup of semolina | 250 g butter |
| Sherbet: | 2 tablespoons of molasses | 1 teacup of oil |
| 62.5 ml of water | 1 packet of baking powder | 1 pinch of salt |
| 0.04 g red dye | 1 coffee cup of peanuts | 2 eggs |
| 0.6 ml rose water | Sherbet: | 3 cups crushed walnuts |
| 72 g icing sugar | 3 cups sugar | Sherbet: |
| 1 cup of grated ice | 3 glasses of water | 5 cups of sugar |
| | 1 teaspoon lemon juice | 5 glasses of water |
| | | 1 teaspoon of lemon juice |

**Table 4.** Material List of Street Beverage Examined in The Study

| **Licorice sherbet (10 cups)** | **Turnip juice (5 cups) (Şalgam)** |
|---|---|
| 100 grams of licorice root | 160 g black carrot |
| 2 liters of water | 120 g of rock salt |
| | 28 g of turnip |
| | 5 g sourdough |

## Results

In this study, the amount of macro and micronutrients provided to the body when a portion of the 10 most popular street foods and beverages in Adana is consumed by a healthy individual was examined (Table 5, Table 6 and Table 7).

As seen in thise study, the highest values in terms of energy were observed in street food (Table 5). Adana Wrap had the highest amount of energy (819.1 kcal). This is due to the fact that it has more fat content than other dishes. The highest amount of protein was

observed, in the liver. This is due to the fact that the main ingredient of the meal is liver. Flatbread had the highest value in terms of carbohydrate contents. In addition, meals have high fat, saturated fatty acid, and cholesterol contents due to their meat content. The rate of meeting the daily vitamin Consuming one portion of liver meets 77.6% of the daily vitamin A requirement of an adult man and 89% of the daily vitamin A requirement of an adult woman. In addition, a portion of Adana Wrap met the entire daily sodium amount of the individual (1674.5 mg). The recommended daily intake of sodium mineral is 1500-2400 mg (TUBER, 2022). According to the results obtained from the findings, one serving of liver has sufficient iron content to meet the daily iron needs of an adult individual (15.1 mg). The recommended daily iron intake for adults is 11-16 mg (TUBER, 2022).

**Table 5.** Energy and Nutrient Values of 1 Portion of Street Foods Examined in The Study

| **Food name** | **Adana kebab** | **Liver** | **Adana Wrap** | **Squeezing** | **Flatbread** |
|---|---|---|---|---|---|
| **Portion size** | 1 portion | 1 portion | 1 portion | 1 portion | 1 portion |
| **Energy (kcal)** | 369.2 | 398 | 819.1 | 609.5 | 621.8 |
| **Carbohydrate(g)** | 0 | 3 | 64.6 | 67.9 | 91 |
| **Protein (g)** | 19.7 | 29.9 | 23.5 | 18 | 25.3 |
| **Fat (g)** | 32.7 | 29.9 | 52.1 | 29.4 | 16.9 |
| **Pulp (fiber) (g)** | 0 | 0 | 3.6 | 4.5 | 3.12 |
| **Cholesterol (mg)** | 94.4 | 396.2 | 123.2 | 79.6 | 36.3 |
| **Saturated fatty acid (g)** | 14.8 | 13.3 | 29.7 | 17.3 | 4.6 |
| **Monounsaturated fatty acid (g)** | 14.4 | 12.4 | 15.9 | 8.7 | 5.9 |
| **Polyunsaturated fatty acid (g)** | 1.5 | 1.8 | 3.5 | 1.5 | 5.2 |
| **Vitamin A (mcg)** | 0 | 2232 | 582.7 | 372.3 | 78.9 |

| | | | | | |
|---|---|---|---|---|---|
| **Vitamin E (mg)** | 0.3 | 0.7 | 3 | 1.3 | 5.3 |
| **Vitamin C (mg)** | 0 | 30.3 | 0 | 5.3 | 15 |
| **Vitamin $B_{12}$ (mcg)** | 2.2 | 45 | 1.1 | 0.6 | 2.5 |
| **Potassium (mg)** | 268.2 | 345 | 209 | 211.9 | 446 |
| **Sodium (mg)** | 70.3 | 115.6 | 1674.5 | 443 | 45.4 |
| **Iron (mg)** | 1.7 | 15.1 | 1.6 | 1.9 | 3.7 |
| **Calcium (mg)** | 18.1 | 5.6 | 295.3 | 192.3 | 50.6 |
| **Magnesium (mg)** | 23.5 | 24.1 | 36.4 | 30.4 | 43.5 |
| **Iodine (mcg)** | 0 | 3.8 | 68.1 | 13.9 | 1.8 |

Among the desserts examined in the study, the one with the highest energy was the Burma Dessert (Table 6). The rate of providing daily energy needs, is 18% for women and 15% for men.

The Burma Dessert provides 39% of the daily carbohydrate requirement. The protein content of sweets, which are rich in carbohydrates, is low. Sweets are poor in vitamins and minerals.

**Table 6.** Energy and Nutrient Values of 1 Portion of Street Desserts Examined in The Study

| **Food name** | **Bicibici** | **Şam dessert** | **Burma dessert** |
|---|---|---|---|
| **Portion size** | 1 portion | 1 portion | 1 portion |
| **Energy (kcal)** | 95.1 | 158.9 | 369.9 |
| **Carbohydrate (g)** | 23.3 | 33.2 | 50.3 |
| **Protein (g)** | 0 | 1.8 | 5.1 |
| **Fat (g)** | 0 | 1.9 | 16.4 |
| **Pulp (fiber) (g)** | 0.1 | 0.8 | 1.6 |
| **Cholesterol (mg)** | 0 | 1 | 35.9 |
| **Saturated fatty acid (g)** | 0 | 0.5 | 5.3 |

| | | | |
|---|---|---|---|
| **Monounsaturated fatty acid (g)** | 0 | 0.8 | 3.9 |
| **Polyunsaturated fatty acid (g)** | 0 | 0.5 | 6.2 |
| **Vitamin A (mcg)** | 0 | 2.8 | 66.3 |
| **Vitamin E (mg)** | 0 | 0.4 | 2.5 |
| **Vitamin C (mg)** | 0 | 0.2 | 0.2 |
| **Vitamin $B_{12}$ (mcg)** | 0 | 0.1 | 0.1 |
| **Potassium (mg)** | 1.5 | 46.8 | 100.5 |
| **Sodium (mg)** | 0.1 | 4.5 | 10.1 |
| **Iron (mg)** | 0.1 | 0.2 | 0.9 |
| **Calcium (mg)** | 0.2 | 12.9 | 23.8 |
| **Magnesium (mg)** | 0.3 | 8.5 | 19.6 |
| **Iodine (mcg)** | 0 | 1 | 1.4 |

Although the energy intake of the drinks is low, licorice sherbet meets 2% and turnip juice (şalgam) is 0.8% of the daily energy intake. Turnip juice has a very high vitamin A content. It meets an average of 120% of the daily requirement for vitamin A. This is due to the fact that it contains carrots and turnips. Turnip juice is rich in sodium and iodine. It meets more than 100% of your Daily requirement. The Türkiye Nutrition Guide (TÜBER) 2022 was used to calculate the daily intake coverage ratio of meals (TÜBER, 2022).

**Table 7.** Energy and Nutrient Values of 1 Portion of Street Beverages Examined in The Study

| **Food name** | **Licorice sherbet** | **Turnip juice (Şalgam)** |
|---|---|---|
| **Portion size** | 1 cup (200 ml) | 1 cup (200 ml) |
| **Energy (kcal)** | 35.6 | 16 |
| **Carbohydrate (g)** | 5.8 | 3.5 |
| **Protein (g)** | 0.8 | 0.6 |
| **Fat( g)** | 1 | 0.1 |
| **Pulp (fiber)(g)** | 0.7 | 1.2 |
| **Cholesterol (mg)** | 0 | 0 |
| **Saturated fatty acid (g)** | 0.3 | 0 |
| **Monounsaturated fatty acid (g)** | 0.2 | 0 |
| **Polyunsaturated fatty acid (g)** | 0.2 | 0 |

| | | |
|---|---|---|
| **Vitamin A (mcg)** | 0 | 900.8 |
| **Vitamin E (mg)** | 0 | 0.1 |
| **Vitamin C (mg)** | 2.6 | 4.1 |
| **Vitamini $B_{12}$ (mcg)** | 0 | 0 |
| **Potassium (mg)** | 252.5 | 123.9 |
| **Sodium (mg)** | 3.8 | 9338.6 |
| **Iron (mg)** | 4.1 | 0.3 |
| **Calcium (mg)** | 18.2 | 71.7 |
| **Magnesium (mg)** | 19.3 | 34.6 |
| **Iodine (mcg)** | 0.5 | 480.4 |

## Discussion

Street foods differ in their nutritional values and food safety. It also significantly contributes to the nutritional intake of people worldwide. Although street food is easily accessible to many people, it is important to meet the energy and nutritional needs of consumers. The ingredients used in street food are culture-specific and recipe sources are often difficult to access. Consumption of street food with a suitable combination in terms of nutritional values enables the consumers to meet their daily nutritional needs at an affordable price (Namugumya and Muyanja, 2012).

In this study, the macro and micro-nutrient contents of Adana-specific street foods with different ingredients were studied. When we look at the nutritional values provided by one serving of street food, which is frequently consumed in Adana (Table 5), it is seen that squeezing, flatbread, and Adana Wrap is very rich in carbohydrates and protein and has a satisfying feature. Although Adana kebab contains high amounts of red meat, it is an important source of protein, but it is poor in carbohydrates. To increase the satiety of Adana kebab, it is usually consumed with foods with a high carbohydrate content, such as pita bread. It has been observed that its cholesterol content is high bacause of the animal fats it contains. The amount of offal contained in the liver is considerably higher than other meals in terms of vitamin A and iron content. One serving of this dish is considered sufficient to meet the daily vitamin A and iron needs of an adult. From this point of view, it is a suitable meal alternative for individuals suffering from anemia. Tail fat used in its production has increased the amount of cholesterol considerably. This is a negative feature for individuals with cardiovascular diseases.

Bibicici, Şam dessert and Burma dessert, which are the most consumed street desserts in Adana (Table 6), differ in macro and micronutrient contents according to the materials they are used. Burma dessert has the highest value in terms of calories, due to its high carbohydrate and fat content. Bicibici is a dessert that is lower in calories and poorer in terms of vitamins and minerals, since there is no material containing fat or protein. It is a light street dessert that is usually consumed to cool off in the summer heat of Adana. Adana street drinks (Table 7) have low calorie content. Turnip juice (şalgam) has a high content of vitamin A due to carrots, sodium and iodine content due to its high salt

content. In general, street foods provide the most energy from food (average 563 calories), followed by street sweets (average 207.9 calories) and the lowest from street drinks (average 51.6 calories).

In a study conducted in Sivas province, bakery products are at the forefront of traditional street flavors in Sivas. It is possible to come across many pita ovens in every neighborhood of Sivas. Katmer and scone, which are bakery products, contain high calories. Another bakery product in Sivas is the head in the oven. Kelle, which is consumed early in the morning, has a high protein content. Despite the high protein content, the high amount of cholesterol has also revealed the opinion that it causes cardiovascular diseases in the province (Seker and Hastaoglu, 2020).

Similarly, Koodagi conducted a study in which he analyzed selected street foods in the city of Dharwad in terms of macronutrients. All selected street foods differed significantly in macronutrients. Sweets provided more energy (311 kcal), followed by non-vegetarian foods (305 kcal) and fast food (239 kcal) the least. The protein and fat content of non-vegetarian foods was followed by fried foods more, while grain foods provided the least. The carbohydrate content of sweet foods was higher (49.46 g), followed by fried foods (42.09 g) and non-vegetarian food (24.08 g) lowest. The fried and fast food group had more fiber, while the non-vegetarian and sweet products had less fiber. The carbohydrate content of sweets (12.37 g) and the fiber content of grain foods (2.36 g) were higher in street food (Koodagi, 2013).

Similarly, Namugumya and Muyanja investigated the average energy, macro and micronutrient intakes from street food consumed by female street food vendors in Jinja and Kampala districts. The average energy intake from street food was found to be 2412 kJ/d. There was no significant difference in the energy consumed by female street food vendors from street food by districts. Among macronutrients, carbohydrate intake was highest for female street food vendors in both regions, with 96.20 g and 106.28 g for Jinja and Kampala, respectively. Protein and fat intakes were roughly the same in both regions. Apart from Ca and Zn, street food provided female street food vendors with minimal amounts of other micronutrients (Fe, thiamine, niacin, ascorbic acid, and retinol). Street food in Kampala provided significantly higher intakes of Ca (194.53mg, 87.79mg, respectively) and Zn (19.36mg, 6.54mg, respectively) than in the Jinja region (Namugumya and Muyanja, 2012).

A study was conducted on the characteristics of street food outlets and the foods sold in Maputo, Mozambique. Most of the street food outlets identified were stable (77.4%) and only 51.9% were selling industrial food. The frequency of fruits, beverages and foods other than fruit was 24.5%, 32.5% and 73.9%, respectively. Toasted cakes were the highest in energy (430 kcal/100 g) and the richest in fat (21.0 g/100 g) and carbohydrates (53.4 g/100 g). The richest sources of protein were boiled meat/fish/liver meals (10.7–11.6 g/100 g). Toasted muffins showed the lowest sodium and potassium content (90 mg/100 g and 81 mg/100 g, respectively), while hamburgers showed the highest content of these micronutrients (455 mg/100 g and 183 mg/100 g, respectively). The highest sodium/potassium ratio (11.95) was found in boiled liver dishes. Fried snacks were found to have the highest trans fatty acid content (0.20 g/100 g) (Sousa et al., 2019).

As a result, street food plays an important role in the daily diet of many people around the world. In addition, street food is convenient, inexpensive and easily accessible. According to the data obtained in this study, street food; It plays an important role in diversifying the diet of individuals, improving nutritional quality, meeting their energy needs, etc. Therefore, consumers should be informed about street food.

As these dishes are a reflection of the local culture, a safe and healthy sales environment should be provided. All steps from the production to the sale of street food should be inspected and the emergence of health problems should be prevented. Street food is preferred by many people because it is fast and practical. For this reason, it is important for sustainable gastronomy that these dishes are frequently checked for food safety so that they do not threaten human health, and that their nutritional contents are transformed into richer forms and presented to consumers.

## Conclusion

Although there are many studies on street food in Turkey, there is no article providing information about the macro and micronutrient contents of street food. For this reason, foreign examples were used when making comparisons. From this perspective, it is thought that this research will contribute to street food studies in the literature and shed light on future studies.

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