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# IMITATION AND ADULTERATION IN FOODS

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**Abstract**

The continuity of human life absolutely depends on the existence of healthy food products. The fact that the world has limited resources and human needs are unlimited, and the human population is increasing day by day in the world, increases the importance of healthy and safe food. Today, due to the development of technology, the increase in food prices, the increase in competition between food companies and economic reasons, imitation and adulteration in food have increased considerably. The Ministry of Agriculture and Forestry, with the authority granted by the Veterinary Services, Plant Health, Food and Feed Law No. 5996, carries out official controls and sanctions related to all stages of production, processing and distribution of food, food contact substances and materials and feed. According to the relevant law; Imitation: It is defined as the representation of products within the scope of this Law as having features that do not exist in their structure in terms of their shape, composition and qualities or as if they were the same as another product, Adulteration: It is the removal of all or part of the elements and nutritional values that give the basic characteristics of the products within the scope of this Law in violation of the legislation or the change of their amount or the addition of another substance that does not have the same value instead of that substance as if it were the same substance. According to the 4th paragraph of Article 31 of this Law and Article 8 of the Regulation on Official Controls of Food and Feed, there is a provision that the name, product name, brand, batch and/or serial number of the company producing/importing food and feed, especially those whose imitation and adulteration have been confirmed by laboratory results, can be shared with the public on the official website of the Ministry. According to the current data, it is observed that some companies continue to imitate and adulterate despite being announced to the public many times due to the inadequacy of sanctions. In order to increase the deterrent effect of the sanctions applied to companies that imitate and adulterate food in Turkey, it would be appropriate to amend the relevant legislation and increase administrative fines, determine these fines by taking into account the annual turnover of food businesses, impose judicial penalties and, in the event of a repetition of the act, to ban the operator from operating in the food sector. In addition to the meticulous implementation of sanctions in this regard being the responsibility of the public authority, it is also extremely important for consumers, other institutions and organizations, universities and relevant to participate in the work in terms of individuals' access to healthy food in our country.

**Keywords***:* Food, Foof Safety, Food Control, İmitation, Adulteration.

**Özet**

İnsan hayatının devamlılığı mutlak surette sağlıklı gıda ürünlerinin varlığına bağlıdır. Dünyanın sınırlı kaynaklarının olması ve insan ihtiyaçlarının sınırsız olması, dünyada her geçen gün insan nüfusunun artması, sağlıklı ve güvenli gıdanın önemini gittikçe arttırmaktadır. Günümüzde teknolojinin gelişmesi, gıda fiyatlarının artması, gıda firmaları arasındaki rekabetin artması ve ekonomik nedenlerle gıdalarda taklit ve tağşiş oldukça artış göstermiştir. Tarım ve Orman Bakanlığı, 5996 Sayılı Veteriner Hizmetleri, Bitki Sağlığı, Gıda ve Yem Kanunu'nun vermiş olduğu yetki ile gıda, gıda ile temas eden madde ve malzeme ile yemlerin üretim, işleme ve dağıtımının tüm aşamalarına ilişkin resmî kontrolleri ve yaptırımlara yönelik faaliyetleri yürütür. İlgili kanuna göre; Taklit: Bu Kanun kapsamındaki ürünlerin, şekil, bileşim ve nitelikleri itibarıyla yapısında bulunmayan özelliklere sahip gibi veya başka bir ürünün aynısıymış gibi göstermeyi, Tağşiş: Bu Kanun kapsamındaki ürünlere temel özelliğini veren öğelerin ve besin değerlerinin tamamının veya bir bölümünün mevzuata aykırı olarak çıkarılmasını veya miktarının değiştirilmesini veya aynı değeri taşımayan başka bir maddenin, o madde yerine aynı maddeymiş gibi katılmasını, olarak tanımlamaktadır. Bu Kanunun 31. Maddesinin 4. fıkrası ve Gıda ve Yemin Resmi Kontrollerine Dair Yönetmeliğin 8. maddesi gereği İllerde, özellikle taklit ve tağşiş yapıldığı laboratuvar sonuçları ile kesinleşen gıda ve yemi üreten/ithal eden firmanın adı, ürün adı, markası, parti ve/veya seri numarasının Bakanlığın resmi internet sitesinde kamuoyunun bilgisine sunabileceği hükmü yer almaktadır. Mevcut verilere göre yaptırımların yetersiz olması sebebiyle, bazı firmaların birçok kez kamuoyuna

duyurulmalarına rağmen taklit ve tağşiş yapmaya devam ettiği görülmektedir. Türkiye'de gıdalarda taklit ve tağşiş yapan firmalara uygulanan yaptırımların caydırıcılık kazanması amacıyla ilgili mevzuatta değişiklik yapılarak idari para cezalarının artırılması, gıda işletmelerinin yıllık cirosu dikkate alınarak bu cezaların belirlenmesi, adli cezaların verilmesi ve fiilin tekrarlanması durumunda işletmecinin gıda sektörü içinde faaliyetinden men edilmesi cezaların uygulanması yerinde olacaktır. Bu konuda yaptırımların titizlikle yürütülmesi kamu otoritesinin sorumluluğunda olmasının yanı sıra tüketiciler ile diğer kurum ve kuruluşlar, üniversiteler ve ilgili STK'larında çalışmalara katılım sağlaması Ülkemizde bireylerin sağlıklı gıdaya erişimi açısından son derece önemlidir.

**Anahtar Kelimeler: Gıda, Gıda Güvenliği, Gıda Denetimi, Taklit, Tağşiş,**

## Introduction

As consumers become more aware and countries update their food legislation more accurately and safely in producing healthy food, significant developments have occurred in this regard, and food safety has become one of the most important issues of recent years. The production of safe food is possible with the correct establishment of the food safety system. A malfunction in a link in the production chain or at any point in the system can put the safety of the food offered for consumption at risk (Kantaroğlu and Demirbaş, 2019).

The fluctuations in food prices globally and the increased competition between companies have led to an increase in food fraud. Because food trade has shown great development globally, and producers have fueled the competition between suppliers in the supply of raw materials and auxiliary materials they need, and have led them to turn to the cheapest option economically. Therefore, this situation has led to an increase in food fraud every year in the world and has seriously threatened public health. These problems have also started to be seen frequently in Turkey recently (Türkmen and Ataseven, 2020).



The European Parliament and Council Regulation No. 178/2002, dated 28 January 2002, which determines the general principles and requirements of the food law, established the European Food Safety Authority (EFSA) and determines the procedures on food safety issues, states in its Article 8 titled Protection of Consumer Interests that consumers should be protected from fraudulent and deceptive practices, food adulteration and other practices that may mislead the consumer (Çığ, 2008). Within the framework of Regulation No. 178/2002, issues related to imitation and adulteration in food seen in Turkey are collected under the general title of "Food Fraud" in the European Union (Anonymous, 2019). Food fraud is defined by the Food Standards Agency (FSA) as "the deliberate placing of food on the market with the intention of deceiving the consumer and for financial gain". In addition, this concept is expressed as an illegal intervention in food in order to gain an economic benefit. Interventions may be in the form of showing the value of food higher than it actually is or reducing its cost by adding cheaper substitutes (Hong and Lee, 2017).

During the EU harmonization process, the Veterinary Services, Plant Health, Food and Feed Law No. 5996, which determines the rules regarding food safety in Turkey, was prepared in accordance with the EU Regulation No. 178/2002/EC, which sets out the general principles and requirements of food legislation in the EU. The Regulation in question states that consumers should be protected from fraudulent and deceptive practices such as imitation and adulteration in food.

With the entry into force of the provisions of Law No. 5996 and the Regulation on Official Controls of Food and Feed prepared within the framework of this Law, the names, product names, brands, batches and/or serial numbers of companies in Turkey that were found to have committed imitation and adulteration as a result of laboratory analysis or that made

changes in food in a way that would threaten the life and health of people began to be shared with the public on the official website of the Ministry of Agriculture and Forestry as of 2012.

**Adulteration;** It defines the state of the food and the materials and materials in contact with the food are produced in contradiction with the legislation or permissible properties. In other words, çıkarıl All or some of the elements and nutritional values that give the basic characteristics of the products are removed or changed in contravention of the legislation, or any other substance which does not have the same value is added as the same substance instead of that substance.

**Imitation**; It is shown that the foodstuff and the materials and materials in contact with the food have the same characteristics as the shape, composition and properties. Products, shape, composition and characteristics of the structure does not exist in the structure, or other products, such as to show the same. The marketing of fruit syrup as grape molasses is a typical example of imitations of a vegetable origin oil as flavored with butter and flavors and butter.

This study; In order to better understand the imitation and adulteration in food, which has been one of the leading issues threatening food safety in recent years, it is important to explain the most common tricks, to reveal the current situation in Turkey, to offer solutions to the problems experienced in public announcements regarding imitation and adulteration, and to increase awareness among consumers about imitation and adulteration. In addition, it is evaluated that if the suggestions made for the problems experienced regarding imitation and adulteration in food are put into practice, it will contribute to the access of consumers to healthy and safe food, which is accepted as part of their current rights, and to the prevention of unfair competition in food businesses that operate in accordance with the legislation without imitation and adulteration.



It is stipulated in the 6th paragraph of Article 31 of the Law that the Ministry of Agriculture and Forestry may provide information about official controls it conducts regarding food to the public (Anonymous, 2010). In addition, according to Article 8 titled “Transparency and Confidentiality” of the Regulation on Official Control of Food and Feed dated 17 December 2011, the name, product name, brand, batch and/or serial number of the company producing/importing the food that is proven to be counterfeit or adulterated according to laboratory results, and the name, product name, brand, batch and/or serial number of the company producing and/or selling the food that is spoiled or modified in a way that endangers human health, can be made available to the public on the official website of the Ministry of Agriculture and Forestry (Anonymous, 2011).

In our country, unfortunately, some producers may benefit from the carelessness of consumers and the lack of conscious consumers and lead to imitation and adulteration for commercial purposes and unfair gain. In addition to the auditing of Ministry of Agriculture and Forestry, first of all, citizens should be conscious and careful consumers, they should read the label information of the products they receive, and they should be careful and questioning when buying food which is unclear or suspicious.

### 1. İmitation And Adulteration Practices İn Turkey

In Turkey, food control and inspection activities are carried out by a total of 8,000 food control officers, including veterinarians, food engineers, agricultural engineers, aquaculture engineers, fisheries technology engineers, chemical engineers and chemists, working in provincial and district directorates affiliated to the Ministry of Agriculture and Forestry, within the framework of the legislation.

The samples taken as a result of the inspections are analyzed in a total of 41 public laboratories, including 39 Public Food Control Laboratories affiliated to the Ministry of

Agriculture and Forestry, Bursa Food and Feed Control Central Research Institute and the National Food Reference Laboratory Directorate. Spectroscopic, chromatographic, molecular, immunological and microscopic methods are used in the laboratories to determine imitation and adulteration in foods (Şenöz, 2016).

In the provinces, after the samples taken during the inspection program or official controls after complaints are analyzed by the Provincial Food Control Laboratories affiliated to the Ministry of Agriculture and Forestry, companies producing products that are found to be non-compliant with the Turkish Food Codex (TGK) regulations are subject to fines pursuant to Article 40, Clause L of the Veterinary Services, Plant Health, Food and Feed Law No. 5996, under the title of sanctions related to food and feed.

The files belonging to these companies are sent by the provinces to the «Food Disclosure Commission» established within the General Directorate of Food and Control for public announcement (disclosure) for final evaluation. After the procedure and principle evaluation made by the commission, the information belonging to the companies is shared with the public on the official website of the Ministry.

Pursuant to the 4th paragraph of Article 31 of the Veterinary Services, Plant Health, Food and Feed Law No. 5996 and Article 8 of the Regulation on Official Controls of Food and Feed, the name of the company, product name, brand, batch and/or serial number of the food and feed that are produced/imported, especially those whose imitation and adulteration are confirmed by laboratory results, are presented to the public on the official website of the Ministry (Beykaya, 2020).

## 2. Typical Food Imitation and Adulteration Samples



### 2.1. Cheats in Grape Molasses

The main reason of the tricks in grape molasses is to reduce the production cost and to comply with the provisions of the Turkish Food Codex. The most problematic issues; Grape syrup, glucose syrup, inulin, HFCS 85, HFCS 55 and HFCS 42 ie fructose is added. In this way, grape molasses production of grape molasses to adjust the amount of ash as well as to try to bring the pH value of 5.0 (Kayahan, 1982).

### 2.2. Fruits for Grape Molasses for tricks

In order to prevent these tricks, C13 analysis was carried out in the “Communiqué of Turkish Food Codex” Grape Molasses, sugar analysis and distribution by HPLC and organic acid analysis values were provided. Other fruits used by the cheers of grape molasses against the legislation in production are:

#### 2.2.1. Fig Extract Addition to Grape Molasses

Figs are considered as dried fruits. At the end of the drying process, aflatoxin figs are separated from the yellow fluorescent color they give under UV light and must be destroyed in order to avoid human consumption. While removing these types of waste products from the enterprise requires a cost, some malicious people take them and boil the dried figs in the open boiler for hours and obtain a very dark black fig extract and produce a rich product of aflatoxin, fragrant grape molasses and grape molasses (forbidden by Turkish Food Codex). use in production. Aflatoxin, a very important mycotoxin, causes cancer and similar diseases in humans. By adding a harmful compound that should not be present in all foodstuffs to the most important traditional Turkish food of our country, they are risking food safety by producing food that harms human health (Anonymous, 1989; Şimşek, 2000; Şimşek vd., 2002; Şimşek, 2004).

### 2.2.2. Apricot Extract Addition to Grape Molasses

By overheating the waste apricots and adding to grape molasses, the consumer is deceived. Addition of apricot to grape molasses creates very important changes in color, aromatic compounds and taste. To prevent this, the product is subjected to extreme heat treatment to increase the HMF value. Since it is a compound that is collected in the human liver, it should not exceed a certain limit according to TGK (Turkish Food Codex). If the waste apricot separated due to excessive $SO_2$, the last molasses also have excess $SO_2$ (max. $SO_2$ limit in dried apricots is 2000 mg / kg) (Üstün vd., 1997; Şimşek vd., 2002).

### 2.2.3. Addition of Corn Syrup (Glucose and Fructose) to Grape Molasses

Grape molasses with the addition of different kinds of corn syrup to grape molasses, such as glucose syrup, fructose syrup (F85, F55 and F42) or mixtures thereof, is reduced but decreases the HMF value. However, the fructose / glucose (F / G) ratio changes and accordingly the C13 value changes (Anonymous, 1989; Şimşek, 2000., Şimşek vd., 2004., Şimşek vd., 2002., Üstün vd., 1997).

### 2.2.4. Inulin (FOS) Addition to Grape Molasses

Addition of inulin (fructo oligosaccharide) to grape molasses decreases the ash value of grape molasses and decreases HMF value. However, the F / G ratio changes and accordingly the C13 value changes.

### 2.2.5. Addition of Watermelon Juice Concentrate to Grape Molasses

With the addition of watermelon concentrate to grape molasses, the ash content of grape molasses decreases but decreases the HMF value. The F / G ratio and, accordingly, the C13 value also vary (Üstün vd., 1997; Şimşek vd., 2002).



## 3. Detection of Tricks in Grape Molasses C13 Analysis

C13 analysis was performed to determine the tricks of the recently prepared Turkish Food Codex Grape Molasses Communiqué. For this purpose C13 value in natural grape molasses is analyzed by AOAC method with IRMS device. As the natural grape molasses decreased, the C13 value deviates from the mean value of -23.5 and shows a lower value (more positive value) (Anonymous, 1989; Şimşek, 2000., Şimşek vd., 2002; Şimşek vd., 2004)

### 3.1. Possibility of Determining Contribution Rates in Grape Molasses

Although there is no standard production method in molasses and the variation of the fruit composition due to many factors makes the detection of imitation and adulteration difficult, if any mixture is mixed with the material, the relations between the components of the molasses and the composition of the composition will deteriorate or the amount of the components of the composition will change. Therefore, the evidences of adulteration and imitation can be determined by determining the boundaries of the composition components of the molasses and by showing the correlations between these components.

## 4. Red Meat Adulteration

466 samples were analyzed by Ministry Of Agriculture and Forestry, to determine whether pork, horse and donkey meat were included in red meat and meat products. 0.65 percent of them were negative. However, the rate of negativity was determined as 3.20 percent in the inspections carried out to determine whether poultry meat was added to red meat products. Of the 406 red meat products, 13 were found to have poultry meat. In the analyzes conducted in terms of microbiological criteria in chicken, turkey, quail or ostrich meat, the negative rate was found to be quite high with 17.98 percent

## 5. Imitation and Adulteration Detection in Honey

### 5.1. Honey Imitation and Adulteration Detection (with EA-IRMS System): C13 and C4 Analysis

Honey is taken by the bees from the flowers and fruit buds and nectar is a very useful food which is formed by the change of chemical by means of invertase enzyme in honey bodies of bees and placed in honeycomb cells in the hive.

When the nectar is turned into honey, the bees invade the sucrose by the invertase enzyme they provide and convert it to fructose and glucose and remove the amount of water to prevent the fermentation from occurring. The honey placed in the cells in the hive and covered with a glaze on the candle, thanks to the special ventilation system provided by the bees comes to the taste and consistency we know.

Natural honey; glucose-fructose (at least 60%), sucrose (up to 5%), carbohydrate-like sugars such as maltose, organic acids such as amylase, tartaric acid, citric acid, vitamins such as B1, B2, B6, PP, C, catalase, lipase , glucose oxidase, various enzymes such as invertase, K, Ca, Na, Fe, Mg, such as elements due to have a very high nutritive properties.

### 5.2. Fake Honey

Knowing the many nutritious and natural properties of honey all over the world for many years has made the product popular and has created a very serious demand. While the difference between production and demand makes the price of quality honey attractive, it has increased the production by fake means. Honey is faltered in three ways: - Fake Honey Production(Without honey) - Honey enzyme addition to corn syrup, - Honey production by giving bee sugar syrup, - Mixing the truth with fake honey



### 5.3. Adulteration in honey

It is not possible to understand the real honey by fake honey. This process is carried out with various analyzes in specialized laboratories. The single and most effective detection method of imitation and

### 5.4. Carbon-13 (C13) Analysis How?

Isotopic technique used in the detection of fake honey; it is based on the differences in the isotope ratio between C3 and C4, which plants naturally have due to photosynthesis. Usually C4 plants, eg Maize, 13C / 12C isotope ratio varies from -8 to -20 n otop, whereas in C3 plants with nectar this ratio is /22 and ,35,. -C4 sugars (cane sugar, corn syrup), -C3 sugars (sugar beet, corn syrup, starch hydrolyzate), carbon atom are found in 3 ways in nature. Of these carbon 12 (12C) isotope is 98,93% in nature and 13 isotope in carbon 13 (1,0%). Carbon 14 (14C) is radioactive and only 0.0000000001% in nature. Since it has a half-life period of 5730 years, it is used as a method in carbon age determination analysis in geography and biology science.

EA-IRMS (Elemental Analysis - Isotope Ratio Mass Spectrometry) with the 13C / 12C ratio of the sugar in the honey is possible to determine the amount of C4. According to the Turkish Communiqué on Food Codex (2005/49), the difference between the protein and crude honey delta Cl3 values in the flower honey is -1 or more positive; The ratio of C4 sugars calculated from protein and crude honey delta Cl3 values should be (maximum) 7%. It is certain that there is adulteration and imitation in the honey that goes beyond these values

## 6. Dairy products

Adulteration and imitation events in dairy products; Full Fat Melting Cheese, Tulum Cheese, Full fat Tulum Cheese, Low Fat Cheddar Cheese, Scone Herb Tulum Cheese, Fatty

Triangular Cheese, Butter, Butter Pasteurized Butter, 80% Milk Fat Traditional Butter, Sprig Butter, Milk Cream, Yogurt, Half Fat Homogenized Yogurt, Full Fat Cream Yogurt (Vegetable Oil addition), Natural Creamy Yogurt (Gelatin addition), Maras Method Plain Ice Cream (Vegetable Oil) addition.

**7. Food Suplements**

It contains sildenafil and sibutramine in supplements and especially those consumed for slimming. These substances are harmful to health.

**8. Bulgur (Cracked Wheat:bulghur)**

Although there is a prohibition in the production of bulghur, there is a use of paint

**9. Imitation and Adulteration in Sauces**

Sauce use shows an increasing trend in terms of quantity and variety in our country. The current legislation on food safety and adulteration of retail and industrial sauces is not sufficient. For example, products with a dry matter in the ketchup up to 8 bricus are commercially available. The use of preservatives in such sauces, which are troublesome in terms of product safety and shelf life, is an important imitation and adulteration.

Some issues related to imitation and adulteration in the sauce products in the market can be listed as follows:

**1.** The absence of product notifications and failure to comply with TSE(Turkish Standard Institute) standards. Ketçapta TSE dry matter must be at least 24 pieces soluble solid, while 8 products are available in the market.



**2.** Shelf-life of this low-briks up to 1.5 years. This can probably be accomplished by conservatives that exceed the legal limit.

**3.** Providing sweetness with artificial sweeteners as a result of low sugar use. The use of artificial sweeteners in ketchup should be prohibited.

**4.** Use of Carmosine, an artificial colorant as colorant in ketchup. The colorants that are forbidden in the paste must be prohibited in ketchup, which is a kind of tomato paste.

**5.** Use of preservatives in amounts exceeding the statutory limit as a result of the amount of fat in the mayonnaise below 15%. The use of herbal blend oils which cannot be sure of its quality in mayonnaise. In mayonnaise, the desired quality properties of the oil in oil as a quality parameter must be searched.

**10. Adulterate in olive oil**

Natural olive oil; high levels of monounsaturated fatty acids (oleic acid) in combination with very important antioxidants (phenolic compounds, tocopherol and other aromatic substances) in the composition obtained by physical (pressing, centrifuging and percolation) methods and having high oxidative stability (shelf life) It is a natural fruit oil (or oily juice). According to this definition, olive oil types known as refined and riviera, and pine oil are not included in the natural olive oil class.

Natural olive oil is the food that is most exposed to fraud and forgery. It is important as a healthy fat source and functional food for nutritional physiology (due to the decrease in the risk of heart disease, high density cholesterol (HDL) enhancer, low density cholesterol (LDL) reducing and protective effect against certain types of cancer). Their superior sensory qualities

add a great value to the natural olive oil with an increasing demand in international trade (Christopoulou, 2004; Dıraman, 2007).

### 10.1. Adulteration in Olive Oil and Determination of Fraud

It is possible to collect the methods which can be used to detect the adulteration of natural olive oil in two main groups.

### 10.1.2. Chromatographic Methods

In this method, natural olive oils are analyzed by Capillary GC Chromatography (Capillary GC) and High Pressure Liquid Chromatography (HPLC) (2). Analysis of capillary-column GC and the types of malabs and tricks used in determining the following: Determination of cis-trans isomers of fatty acids (determination of refined olive oil / pomace oils, especially with total trans fatty acids and other vegetable oils), fatty acids ethyl methyl total of esters (determination of deodorized olive / pirina oil or colon leakage), Steren (Stigmadien) analysis (refined or crude seed oils, adulteration of refined olive oil and pirina oil), analysis of wax (determination of the addition of pirina oil), sterol analysis ( determination of other herbal - partially hazelnut oil-oils).

With some studies, some vegetable seed oils (sunflower, soybean, rapeseed, mustard and peanut oils) are added to natural olive oil at around 5-10%. Fatty acid profile analysis was not found to be effective in determining the adulteration of hazelnut, almond and pumpkin seed oil similar to olive oil (Draman, 2007; Dıraman vd., 2011; Mueller, 2024; Öztürk vd., 2004).

### Conclusion and Discussion



Today, it is known that there are all kinds of fraud or deceptive actions in food production. Imitation and adulteration in food is applied to products such as meat and meat products, milk and dairy products, vegetable oils, food supplements and many other foods. Public announcements in food in Turkey have been implemented since 2012 within the scope of Law No. 5996. The Ministry of Agriculture and Forestry takes measures such as administrative fines, product recalls, public announcements, criminal complaints to the Public Prosecutor's Office and increasing the frequency of inspections against businesses that are determined to have committed imitation/adulteration as a result of laboratory analysis or that produce food that poses a risk to human health.

Imitation and adulteration in food is a fraud that deceives the consumer and poses a threat to consumer health, as well as creating unfair competition and causing unfair profits, and is a situation that should be prevented in terms of both health and commercial ethics. In addition, if the products offered to the market both domestically and abroad are found to be fraudulent, both food producing companies lose their reputation and the buyer countries may impose restrictions on the sale of such products to Turkey. This situation both harms the country's economy and leads to a loss of trust in products produced in Turkey (Türkmen and Ataseven, 2020).

In addition to the meticulous implementation of sanctions being the responsibility of the public authority, it is extremely important for consumers, other institutions and organizations, universities and relevant NGOs to participate in the work in order to enable individuals in our country to access safe food. In particular, it is extremely important to implement serious deterrent penalties within the scope of imitation and adulteration and to follow the issue meticulously. We believe that it will be more accurate to revise the legislation and establish procedures accordingly by taking into account the concepts of "intention" and "fault" in legal terminology, and to distinguish companies that are aware of their responsibilities from companies that do not carry this responsibility.

In addition to the inspection activities carried out, raising consumer awareness constitutes the most important part of this work. The public authority should support initiatives that will encourage food literacy along with awareness-raising activities, and should especially focus on studies targeting our youth, who are the guarantors of our future. In addition, giving more space to personal care, hygiene education, proper nutrition, food waste and food safety in the school curriculum and increasing activities that contribute to the development of consumer awareness will seriously accelerate the efforts to combat inappropriate foods (Beykaya, 2020).

Adulteration and imitation negatively affect the quality, safety and reliability of food. While consumer confidence is damaged, food businesses suffer material/moral damage. Discussions on safe food products have reached serious levels in recent times. Adulteration, imitation and counterfeit production in the food industry is a common global problem not only in Turkey but also in many countries in the world, including other economically and socially developed countries. It is stated that the more complex the supply chains in the food industry and the more processed the food, the more opportunities for counterfeiting increase. What is important is how precautions are taken against these problems and how the problems are managed. In this way, deception of consumers is prevented.

As a result, this issue closely concerns everyone from seven to seventy-seven. In order to reach safe food, to prevent unfair competition and underground economy created by opportunists in the food sector, everyone has a great responsibility, both on the producer and consumer side.

seed oil similar to olive oil.

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