

The Place of Sesame and Tahini in Turkish Gastronomy

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Abstract

Sesame, which is a protein-rich product like all oilseeds, contains between 19-31% and an average of 25% protein. The carbohydrate content is about 14% and the fat content is about 50%. Fat and protein-rich sesame seeds are used in tahini production, while those which are low on fat and protein are used for making bagels, pies and biscuits. Sesame, which is one of the oldest oilseeds in the history of humanity, has been used as a food since ancient times, as well as for healing and as oil sources. In Turkey, sesame seeds are used mainly for the production of tahini, halvah and sesame oil. In addition, it is common to use sesame seeds as a garnish for bread, halva, pita bread and buns in pastry products. Moreover, as sesame oil is an oil resistant to deterioration due to sesamol and sesamolins it contains, it is preferred in potato chips production more than the others. It is an undeniable fact that oilseed crops are at least as important as cereals in our country. This research was conducted to give information about the uses of sesame and its place in Turkish culinary culture.

Keywords: *Sesame, oil seeds, Turkish cuisine, Gastronomy*

Susam ve Tahinin Türk Gastronomisindeki Yeri

Öz

Tüm yağlı tohumlar gibi proteince zengin bir ürün olan susam, %19-31 arasında, ortalama %25 dolaylarında protein içermektedir. Karbonhidrat içeriği yaklaşık %14 olup yağ içeriği ise yaklaşık %50 civarındadır. Yağ ve protein miktarı fazla olan susam tohumları tahin üretiminde kullanılırken az olanlar ise simit, börek ve bisküvi üretiminde kullanılmaktadır. İnsanlık tarihinin en eski yağlı tohumlarından biri olan susam ilkçağlardan beri gıda olarak kullanılırken, şifa amaçlı ve yağ kaynağı amaçlı da kullanılmıştır. Türkiye’de, susam çekirdeği ağırlıklı olarak tahin, tahin helvası ve susam yağı üretiminde kullanılmaktadır. Bunun yanında pastacılık ürünlerinde ekmek, helva, pide ve çöreklerin üzerinde garnitür olarak da susam kullanımı yaygındır. Ayrıca, susam yağı içerdiği sesamol ve sesamolinden dolayı bozulmaya karşı dayanıklı bir yağ olduğundan dolayı, patates cipsi üretiminde diğer yağlara oranla daha çok tercih edilmektedir. Yağlı tohumlu bitkiler ülkemizde en az tahıllar kadar önemli bir ürün olduğu yadsınamaz bir gerçektir. Bu makale, susamın kullanım alanları hakkında bilgi vermek ve mutfak kültürümüzdeki yeri üzerine bilgi vermek amacıyla yazılmıştır.

Anahtar Kelimeler: *Susam, yağlı tohumlar, Türk mutfağı, Gastronomi*

INTRODUCTION

Sesame (*Sesamum indicum*) is a plant species of the *Pedaliaceae* family and is produced in warm regions of Africa, Asia, Europe and Turkey. The sesame seed grown in Antalya, Burdur and nearby cities, is in the first place in terms of quality in Turkey. According to Turkish Statistical Institute (TÜİK) data, 280.887 hectares of sesame produced in Turkey and 18.530 tons of sesame seeds were produced in 2015. This production is not enough to sesame seed in Turkey and foreign dependency increased (TÜİK, 2015). Sesame yield (50-70 kg / decare) is low and therefore brings less income. So, it is steadily decreasing year by year sesame cultivation areas in Turkey (Solverkimya, 2013).

Sesame seed differs in terms of shell color, such as white, brown, yellow and black, and also shows a difference in the amount of fat and protein content, and growing conditions.

Therefore, the amount of fat in sesame seeds ranges from 44-54% (Akin, 2018). Sesame is also mainly used in the production of tahini, tahini halva and sesame oil in Turkey. Besides these uses, sesame is used as a garnish on bagels, pide and buns in pastry products. Tahini, which is widespread in Asia, Middle East and Mediterranean countries, is intensely consumed directly or with other foods because of its nutritious and delicious property (Özcan and Akgül, 1994).

Tahini is a product obtained as a result of cleansing, wetting, crusting, washing, drying, roasting and milling of sesame seeds. Definition of tahini according to Tahini Communiqué (published by the government and compulsory for food quality); “Sesame (*Sesamum indicum* L.) seeds suitable for the production of tahini are obtained by crushing the shells according to the technique and drying them in the oven after being dried and roasted in the oven”.

Also, tahini must have its own color, taste and smell. The amount of sesame oil must be at least 55%, the amount of water must be at least 1.5%, the amount of protein must be at least 22% and the amount of salt must be at most 0.1%. The acidity should be at most 2% expressed as oleic acid (in the extract of sesame oil), the crude cellulose content should be at most 2.4% and should not contain any foreign matter. The antioxidant and stabilizing substances permitted in the Turkish Food Codex may be included to prevent phase separation (Turkish Food Codex Communiqué on Tahini Halva [TGK], 2015b).

There are not enough studies in the literature about tahini, but a limited number of researches are available. According to this information, majority of the tahini samples consist of 55-60% oil, 23-27% protein, 6.4-20% carbohydrate and 1-3% water (Özcan and Akgül, 1994). Tahini also contains important minerals such as calcium, iron and magnesium. Tahini oil is defined as durable oil due to significant antioxidant contents such as sesamin, sesamol (Namiki, 1995). Solid materials in tahini are suspended in oil. During storage, solid materials collapse to the bottom of the jars and eventually separation occurs between solid and liquid phase during marketing periods. In this way, sedimentation can occur in the presence of solid and liquid

phases. The phase separation that arises in time creates consumer dissatisfaction. For this reason, some producers use emulsifiers which are allowed to be used in other foods in order to eliminate this phase (Basdogan, 2016).

Ripeness and Harvesting

All capsules on the sesame plant don't reach harvest maturity at the same time. If all the sesame plants are waited to come to harvest maturity, craken seeds fall down to the ground in capsules that ripen early and therefore yield losses may occur. It is understood that the plant becomes in the harvesting stage when the capsule color turns to yellow and a partial disappearance of the lower leaves. Harvest is usually done by manually removing the plant or cutting it where the place close to the ground. Firstly, 10-15 of the harvested plants are bunched. Then, 8-10 bunches are put together and then connected from the upper parts to create a structure called 'gumul'. The drying period of fagumulis is 8-15 days depending on the weather conditions (Figure 1). After drying, the bundles are shrunk onto a clean nylon cover for blending. The seeds are sifted through thick and thin sieves to remove them from plant waste. Then the seeds are thrown to a suitable and clean area and the remaining thin materials are separated by air, so the seeds are cleared (Tan, 2018).



Figure 1. Sesame plants and the sesame seeds obtaining from plant capsules by hand beating (Tan, 2018).

Place of Sesame in Turkish Cuisine Culture
Turkish cuisine has a very rich structure with its traditional dishes and drinks. Many appetizing foods are being prepared by using cereals as the main material by using various materials and techniques according to their features in Turkish cuisine. Factors affecting the eating habits of Turks are; agricultural structures, being influenced by other communities around the world, differentiation according to socio-economic level and tradition of eating according to regions. In the past, grains have played an important role in feeding the Turks.

Wheat, the most produced and consumed cereal type; is first processed to flour, consumed after being made bread. In Turkish breakfast culture, eating bagels and drinking tea is an important composition. The production of bagels without sesame seeds can rarely happen. In a big city such as Istanbul, Ankara, Antalya, many cake shops or tea and bagel places called Smit Palaces were established. Sesame seeds also used in the product, like meatballs and some other traditional pastries (Onur, 2017; Arli and Isik, 1994).

In previous years, it was known that sesame was produced too much in Anatolia. There was an extraordinary sesame seed called “Golden Sesame” had been grown up in the Manavgat district of Antalya during the Ottoman Empire and its production still continues in Manavgat under the same name. However, the amount of production is decreasing day by day. Sesame products were important foods in the Ottoman culinary culture. Even it was also found in the sultan’s tables, which was delicious and healing.

PROCESS STEPS IN TAHINI PRODUCTION

Removal of Foreign Matters: Sesame seeds, no matter how carefully harvested, may be mixed with plant-based and environmental-derived foreign substances. Foreign materials (stone, soil, etc.) can be mixed during or after harvest of sesame seeds. For this reason, the foreign substances that may be in sesame must be removed before processing. This process is important in terms of the purity of tahini and health-appropriate quality. For this purpose, screens, trims and pneumatic separators are used based on the difference in size, shape or density. In addition, metal detector systems are used for the separation of ferrous materials mixed with sesame seeds (Figure 2) (Basdogan, 2016; Solverkimya, 2013).

Shell Peeling and Separation: The sesame seeds are wrapped in a thin shell. In order to be able to produce good quality and healthy tahini, it is necessary to peel the sesame shell. Though the shell on the sesame seed is thin, the proportion of the shell is around 15-20% because the sesames are too small. Sesame shells are rich in oxalic acid, calcium and cellulose. According to findings, the amount of oxalic acid in seeds is 2.5-3.0%, it reaches 15% in shell. For this reason, in the production of

all sesame products prepared to be consumed as human food, the removal of the seed shells firstly carries importance in terms of healthy nutrition. Because the free form of the oxalic acid in the body, forming salt with calcium in the environment, it leads to an unfavorable structure for human health. The amount of oxalic acid in the peeled sesame seeds is reduced to 0.25%. In addition, the percentage of phytic acid in the shell reaches 5%. The phytic acid in the shell reduces the availability of minerals in the body. Lime milk (CaOH) is added to sesame to be used in tahini production in washing pool in order to make the sesame more resistant to heat and to ensure that the drying and roasting processes are balanced (Solverkimya, 2013; Yasar vd., 2008).

First Wetting: One of the most important processes in tahini production is the separation of shells. Because peeling the shells is crucial in terms of nutrition value of tahini. The fact that the sesame seeds are too small make this process difficult. For this reason, sesame is subjected to multi-stage washing, holding, chemical application processes. Despite the fact that the production of tahini is usually carried out by conventional and primitive methods, the peeling process can still be carried out with the desired efficiency (Solverkimya, 2013). Different processes can be applied by the companies during the separation of the sesame shells. The first step of the shell separation process is the first wetting. According to local and traditional methods applied in Turkey, sesame is kept in water (12% saline water) 5 times its weight for at least 8-10 hours in the first wetting step. The purpose of this process is to soften sesame seeds so that the shells can easily be separated from the body (Basdogan, 2016).

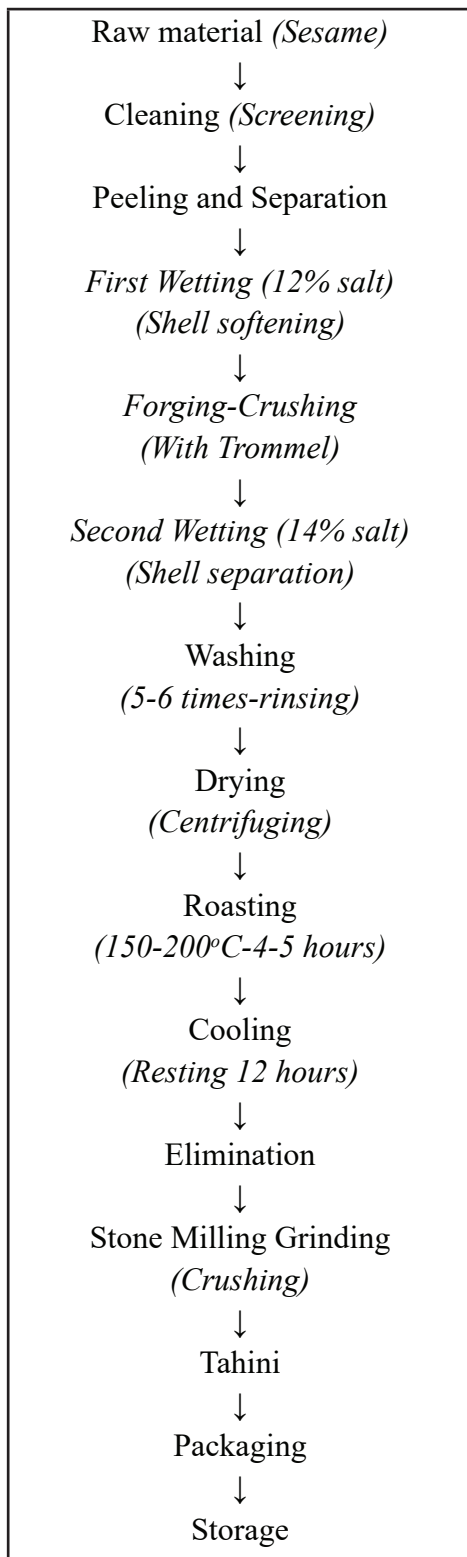


Figure 2. Tahini production process flow chart

Beating: The wetted sesame seeds must be swollen, cracked and separated from the seed. A special machine called trommel is used for this purpose. Softened sesame seeds passed through a cylindrical trommel device as a second stage. After first wetting, the wetting water is removed from the sesame. Sesames whose shells are soft enough are taken into a cylindrical trommel with a diameter of about 100 cm. It has a spindle passing through the center of the cylindrical trommel, and there are strikingly moving pallets attached to it. These pallets rotate at a speed of 30 cycles per minute. In this way, the seed crusts, which are partly multiplied and beaten, are easily separated from the sesame seed while being mixed in the trommel. This process is continued until the shells on the sesame seeds are completely separated. Normally, the fat content of the sesame seeds increases proportionally with the removal of almost no fat-free shells from the grains containing 44-54% fat (Solverkimya, 2013).

Second Wetting: After the beating process, the shells are separated from the sesame seeds by using the weight difference method. Sesame and shell mixture in the trommel device are taken into 14% saline pool. In here, due to the density difference, the sesame grains are on the top, while the shells are collected under the pool. Sesame seeds accumulated above the saltwater pool are collected by the strainer. Salt water is used to separate the free shells from peeled grains in the mixture. For this, after preparing the salt solution, the mixture of shell and seed is added to this solution. As the density of peeled grains is lower than the density of the shell, the grains are collected on the water surface, while the heavier shells sink. Thus, while the peeled seeds are taken from the upper part by sieve clamps, the collapsed shell mass is removed from the pool from time to time (Solverkimya, 2013).

Washing – Rinsing: The salt solution on the seeds is removed by three successive washing cycles. According to the practitioners' opinion, a fourth wash with calcined water is beneficial for homogeneity and efficiency in subsequent roasting and drying processes. After washing with lime water, the seeds washed with normal water for one more time then centrifuging process can be applied in order to remove the water remaining amongst the sesame seeds (Solverkimya, 2013).

Roasting and Drying: No matter which way seeds are peeled; they contain high percentage of water. These seeds cannot be directly milled or crushed. Otherwise, it is not possible for the seeds to be crushed in colloidal size and to form a homogeneous emulsion. For this reason, peeled seeds should be roasted and dried approximately 3- 5% of water. Also, this process provides more efficient breakdown of both seed cells and tissues, as well as provides tahini taste and aroma in sesame seeds by roasting. In this way, during cooking, a large portion of the nitrogenous substances in the structure of the seed will be coagulated. The seed becomes a crisp structure that is better to be crushed and can be easily milled (Solverkimya, 2013).

Roasting and drying can be done directly in direct-heated ovens or double-walled roasters. Although the roasting process is initially carried out at a temperature of 100°C during the cooking phase, this process is carried out at a temperature of 150-200°C for a period of 2-2.5 hours in the subsequent roasting and drying stage, taking into account the desired color in the tahini. However, by avoiding high temperatures, a slightly longer roasting and drying process, which lasts slightly longer at

temperatures such as 120-150°C, may allow the production of higher quality tahini in terms of color, aroma and taste (Akin, 2018). On the other hand, when a dark colored tahini is desired, it is necessary to raise the roasting temperature to 150 degrees in order to provide the brownish color. A large part of the nitrogenous substances in the structure of long-grilled sesame seeds become more coagulated and better crushed (Solverkimya, 2013).

Sesame seeds are white or brown according to the peeling process. Sesame grains are roasted in the roasting machine before grinding. Roasted sesame seeds are grinded by stone mill. Tahini made of sesame seeds without shell is light colored and the one made of shelled seed is dark in color.

Cooling

The sesame seeds that have been roasted are firstly must be cooled to room temperature. Then milling process is performed. Regardless of which type of mill is used, the most important point to be taken in terms of the product quality is to ensure that the process and product temperature is 70-80°C. For this purpose, mills are equipped with cooling systems, especially in modern enterprises, in order to prevent the rising of the milling temperature (Solverkimya, 2013).

Milling

The grains, which are obtained by cooking and roasting, are first cooled down to normal temperature. Then, during the consumption, milling is carried out in such a way that it does not leave a rough sense in the tongue. After roasting sesame seeds are milled in mill stones. Grinding is done with modern mills as well as stone mills. Grinding thickness can

be adjusted according to the purpose of use. Tahini is obtained after milling. Therefore, one of the factors affecting the quality of tahini is mill stones. When the grinding of the desired thickness of the stones is not achieved, the coarse and small particles are combined and the homogenization of the tahini produced in this way is not at the required level. This situation is negative in terms of the quality of tahini and is not desired. As a result, a rough feeling of roughness will occur in the mouth. In addition, in case of waiting in the jar, phase separation over time can occur in the tahini and therefore a very thick mass at the bottom can be formed, while oil can be collected in the upper part. It is possible to use an emulsifier between 0.5-1.0% in order to prevent this negative situation (Basdogan, 2016).

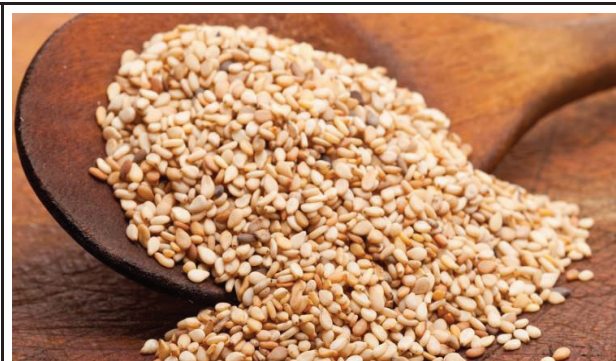
Dark and lightcolored tahini

During the production of tahini, the rate of separation of the shells of the sesame seeds is called “with whole-shell” (un-removed shells) and “non-brane” (removed shells). Whole-shell tahini is produced by picking up the shells of sesame seeds in a very small proportion or

produced without removing it at all. Color, taste and darkness are denser in whole wheat. In terms of vitamins and minerals, these rates are higher in whole-shells tahini (Figure 3) (Turkish Food Codex Communiqué on Tahini [TGK], 2015a).

Dark colored tahini: Sesame seeds are not peeled. This type of tahini is thicker and darker in color. Whole-shell (without peeling) tahini is a thicker, less viscous product with a lower viscosity. It is due to the fact that the dark sesame is slightly more roasted and crusted. In addition, the sesame oil may be a little more cooked or a certain amount of the color may be brown (Figure 3).

White (gray) Tahin: It is produced by taking the maximum amount of sesame shells on the seeds. Color, taste and darkness are lighter in color and fluent when compared with whole-shell one. The intense taste of shell origin on whole shell is slightly more simplified. In addition, the oil ratio of white tahini (again from the shell) has a higher oil content than those of dark color ones (Figure 3).



White sesame seeds



Brown sesame seeds



Stone Mill used in tahini grinding



Sesame roasting device



White tahini



Yellow tahini

Figure 3. Stone mill, roasting device and white and yellow tahini produced from sesame seeds

Phase separation

Phase separation which may occur in the production of tahini is a critical problem. However, in most stone mills, there may be a combination of large and small particles in tahini and homogenization cannot be achieved sufficiently. Thus, in the product, the phase separation occurs over time and a very thick mass is formed at the bottom while the oil is collected on top. In fact, the phase separation may be occasional, although it is less in the case of very large particulate-free tahini. For this reason, as well as a proper grinding to prevent phase separation, lecithin or emulsifying agents such as mono and diglycerides must be included in a certain proportion. Since the amount of the materials to be used for this purpose and the process technique will vary according to the type of sesame used, the appropriate amount should be determined by preliminary trials (Basdogan, 2016).

Taste of Tahini

Sesame is extremely consumed more than itself in Turkey as sesame seed or as a tahini. Almost in all pastries in Turkey, use of sesame seeds are a necessity. Tahini is not only as a predominant taste in flavor, but also adds a glorious value to the material under it. Tahini is delicious and very all-purpose product. Tahini is used in breakfasts, meals and in many bakery products. The flavor of the tahini varies depending on the amount of sesame seeds, the process and duration of roasting. The taste and aroma of the product are formed mostly during the roasting process. During the roasting process, the majority of the nitrogenous substances in the seed structure are coagulated. Therefore, the sesame seeds will be better crushed and have a good structure. In addition, the subsequent drying process can be easily grinded to obtain a crisp structure. Roasting sesame seeds is very effective on the taste and color of tahini.

PRODUCTS USING SESAME

Tahini Halva

Sesame seeds are crushed and then used to make tahini and tahini halva. Because of the higher oil content in tahini, the energy is also high. Because sesame is also rich in protein, calcium and B vitamins, that is why the nutritional value of the tahini halva is superior when compared with some other desserts made from those made only from flour, oil and sugar (Laxton and Berg, 2005; Onur, 2017).

Tahini is a product that can be found in almost all Near and Far East markets with its light pasty consistency. To be able to benefit from the full fate of the tahini, whole-shell tahini should be consumed. However, the amount of oxalic acid in dandruff is resulted from the amount of calcium in the environment. Thus, calcium salts are formed and become useless for human. For this reason, some people consume non-dandruff (white) tahini (Akin, 2018). Sesame seeds are grinded into the mills until the desired consistency. This oily mixture, which is ground, like a paste, is called tahini (Batu and Elyildirim, 2009).

Light-colored and dark-colored oils were obtained from sesame products. Halva is produced with various additives from tahini. If it is produced without flavor, it becomes plain-halva and if pistachio is added, it becomes pistachio-halva. If cocoa is added, cocoa and fruit concentrate become fruit halva (Figure 4).

According to the Turkish Food Codex Tahini Halva Communiqué, tahini halva should have its own color, taste and odor and no foreign taste and odor. Tahini halva will not contain any foreign matter. Tahini halva has its own homogeneous fine fiber structure and should not have any sugar crystallization. The properties of the tahini and tahini halva, which

are suitable for their technique and hygienic production, preparation, processing, storage, transportation and marketing stages, are determined. According to the Turkish Food Codex Tahini Communiqué of the Ministry of Agriculture and Livestock, Tahini will have its own color, taste and smell and no foreign

substance will be found. The additives used in the products covered in the Communiqué must comply with the provisions of the Turkish Food Codex Communiqué on Food Additives (Turkish Food Codex Communiqué on Food Additives [TGK], 2013).



White sesame oil



Brown sesame oil



Tahini Halva with pistachio produced from sesame seeds



Plain tahini halva produced from sesame seeds

Figure 4. Sesame oil and tahini halva samples produced from sesame seeds

Tahini halva is a traditional Turkish food. Tahini is a sweet made with sugar, citric acid, tartaric acid and extracted broth (self-extracting obtained by forging the roots of the plant). It is seasoned with plain, walnut, pistachio and cocoa. Tahini Mal va is known as Turkish Honey, Turkish Dessert or Turkish Halva in the Western World (Onur, 2017; Karakahya, 2006). On the other hand, with the addition of 5-15% water to the crystal sugar, the sugar is melted, and a good mixing process is carried out with the heat treatment in order to concentrate and give a viscous structure. In order to provide bleaching, 0.1% of the extract was added during the thickening process. In the resulting wax, it is mixed in a warm state with 1:1 pre-prepared tahini without cooling. As a result, tahini halva is produced (Solverkimya, 2013).

Crocان with Sesame

In the steel pot or pan (it is better to use steel). Put 2 cups of non-roasted sesame seeds and roast until low in pink (take 10-15 minutes). On the other hand, we put oil paper on the counter and ready it. In a second pan or saucepan, 3 teacups of powdered sugar are placed and 4-5 drops of lemon juice is dropped and the sugar is left to melt by itself. However, it should be

mixed frequently. Caramelized. Caramelize is continued until the color is in the open tea pot. The color should not become too dark. Otherwise the taste will be bitter because the excess amount of sugar will burn. When the sugar is fully melted and the color we want, the roasted sesame is added to this sugar and mixed. Meanwhile, 1 tablespoon of butter is added. This sweet mixture, which has reached the desired consistency, is poured onto the oil paper. It is necessary to move fast because this mixture hardens very quickly. Pour the greaseproof paper over and roll it over with the roller and thin the desired thickness. Care must be taken not to touch this intermediate product. Because sugar is very hot with this state is very dangerous and burning. With the help of a sharp knife without cutting, it is cut to the desired dimensions or cut into small pieces.

Crocان consumption of countries like Turkey is particularly famous in the cold in winter. Using sesame and roasted nuts in sugar production and consumption is widespread in Turkey. In addition, sesame seeds are used in some other desserts like crocan. Sesame and dessert are among the very special foods that complement each other (Figure 5).



Figure 5. Crocans and sweets produced from sesame seeds

Sesame Bagel

According to the formula, all materials, especially liquid materials, are taken into a container and a dough with a softness of the earlobe is obtained. Set aside for fermentation and stand for 45 minutes. The fermented dough is taken and divided into tangerine sized dough balls (meringue). Then these meringues are split again into two equal pieces and is tied to each other and shaped as a bagel (Figure 6). Then put a large amount of sesame seeds on it and then put them in a baking tray and bake in a pre-heated hot oven at 200°C.

Tahini-Pekmez Mixture

Tahini is mixed with pekmez and is consumed especially in winter in the morning breakfast.

The picture of yellow tahini produced from brown sesame seeds mixed with pekmez is a good sample for this (Figure 3). The most important point to be careful about this mixture is to use the right amount of tahini and pekmez mixture ratio. The purpose of preparing mixture to increase the pekmez consumption. Tahini should not only be considered as flavor. It is recommended that the ratio of tahini molasses to be 1:2. So 1 portion of tahini should be mixed with 2 portions of pekmez. This ratio ensures the balance of energy content and nutritional value of them. It should be remembered that every healthy food is a hidden danger for our health.



Figure 6. Some different breakfast bakery foods produce with sesame seeds

Bakery products are definitely consumed at breakfast such as rolling patty with sesame and sesame seeds. Tahini-pekmez (molasses) mixture and different sesame buffers are the popular morning breakfast ingredients. Sesame able to produce different pastries in many different forms and is widespread in Turkey.

Health Benefits of Sesame and Tahini

The sesame seeds are subjected to various processes and are crushed; it prevents the winter diseases such as colds and flu, increases the body resistance due to antioxidants, decreases the risk of developing these diseases and also helps to overcome the disease period more quickly and effectively. Thanks to its antioxidant properties, it increases the body resistance against cancer. Thanks to its cell-protective properties, it fights actively with cancerous cells. Calcium,

which is a raw material in sesame, helps to protect bones. It provides bone development of children in developmental age. It is effective in eliminating constipation by enabling the digestive system to work more actively (Basoglu, 2016).

In addition, liver and stomach friendly molasses cough sounds good. Pekmez can be produced from fruits containing many sugars such as grapes, mulberries, apples, carob etc (Batu, 1991). It has blood-forming properties due to the iron containing +2 valuable molasses. In addition, the body resistance, the immune system to increase the resistance and strength of the disease is protective against diseases (Batu, 1993). It is also known that it increases breast milk. There is also an inflammatory feature of it. Recently, pekmez are used as natural sweeteners instead of sugar

in pastries and desserts. This method, which is used to feed pekmezs to children who do not like it, is very beneficial in terms of health. Therefore, the mixture of tahini and pekmez is extremely important for human health and nutrition (Ozel, 2018).

People can consume the mixture of tahini and pekmez as an extremely delicious and energizing mixture, especially at breakfast. Pekmez (made from many fruits, especially from grapes) and tahini (made from sesame seeds) are two very valuable foods. There is plenty of vitamin E in it. It is also rich in both vitamins C and B. The mixture of tahini and pekmez is protective against cancer. Prevents vessel stiffness and congestion. It's a diuretic. It provides protection against toxins created by heavy metals, toxic compounds, radiation and some drugs effects. It has been shown to have a positive effect on the prevention of aging memory as well (Alzheimer's) (Ucar, 2007).

It is stated that sesame oil (SO) is a supplement that has been known to have anti-inflammatory and antioxidant properties, which makes it effective for reducing atherosclerosis and the risk of cardiovascular disease (Hsu and Parthasarathy, 2017). Additionally, lignans and lignan glycosides present in the sesame oil appear to be the most important functional components. Recently, much attention has been focused on the sesame lignans because they have potent antioxidative activity capable of preventing SO from peroxidation, even at low concentrations (Suja, Abraham, Thamizh, Jayalekshmy and Arumughan, 2004).

Sesamin is the most abundant lignan in SO. It enhances hepatic detoxification of chemicals, reduces the incidence of chemically induced

mammary tumors, and protects against oxidative stress (Akimoto et al, 1993). Sesamol is an effective antioxidant found mainly in roasted sesame or in processed SO. It is a phenolic derivative with a methylenedioxy group and like vitamin E, it is known to be an antioxidant present mainly in processed SO. It contains a class of unique compounds known as lignans. Lignans comprise sesamin, sesamol, and a small amount of sesamol (Kanu, Bahsoon, Kanu, and Kandeh, 2010).

CONCLUSION

Sesame as a valuable seed oil appears to have numerous beneficial properties for applications in food industry. The place of sesame and tahini in Turkish gastronomy culture is very important. Since a significant period of Turkish history, at least since the Ottoman Empire, sesame and tahini have been widely used. Sesame seed has an indispensable place in Turkey today. In addition, sesame seeds are used in large quantities in the production of tahini and pastries in Turkish culinary culture. Tahini production has become more popular in recent years as a result of using the hygienic production method in modern mills. Tahini also eagerly consumed by mixing with pekmez in winter breakfast. Therefore, sesame and tahini have an important place in the Turkish culinary culture and in the history of Turkish gastronomy. Moreover, the value of sesame and tahini is better understood every day and its importance is increasing day by day.

Additionally, sesame seed is widely used in confectionery and bakery products in the food industry. Oilseeds are an important nutrients much as cereals and their use in kitchens should be expanded. However, it is seen that; sesame production does not meet domestic demand and imports are made. The measures mustbe taken in this regard can be listed as follows;

* Sesame production should be encouraged by the Ministry, informative panels should be arranged, and state support should be provided to farmers.

* In order to keep children away from ready-to-eat foods containing glucose, advertisements and public spots that increase the consumption of molasses and tahini should be supported with nutrition experts.

* The use of sesame in kitchens should be increased by developing sesame recipes in local and international competitions and information should be given on the usage areas in written and visual media. Extensive research on sesame seeds should be conducted on geographic marking.

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