Ref. Ares(2025)474450 - 21/01/2025

PRODUCT SPECIFICATION

1.1. Name

'Aydın Çam Fıstığı '

1.2. Description of the agricultural product or foodstuff

'Aydın Çam Fıstığı' is the fruit obtained from the endosperm part of the seeds of *Pinus pinea Lin*., tree grown in the Aydın province, separated from the cone after harvest and cleaned from its membrane and shell, which resembles an ellipsoid with one end pointed and the other end elliptical, and also contains the embryo.

Its color varies from light to dark cream, with a very pointed and slightly dirty yellow tip, and it has a moderately plump body. It is sold in the market without its shell.



Figure 1. 'Aydın Çam Fıstığı '

Some sensory, physical and chemical properties of 'Aydın Çam Fıstığı ' :

- Color: Light to dark cream
- Shape: Very pointed
- Length (mm): 12.4-14.2
- Width (mm): 4.1-6.1
- Weight of 100 pieces (g): 13.3-21.2
- Smell: Slight pine scent
- Taste: Slightly oily
- Texture: Crispy
- Internal yield (%): 21.3-28.6
- Moisture (%): 3.9-5.6
- Ash (%): 3.7-6.5

- Mineral Substances
    - Phosphorus (%): 1.9-3.4
    - Potassium (%): 2.1-2.8
    - Magnesium (%): 0.9-1.6
    - Calcium (%): 0.18-0.46
    - Sodium (%): 0.01-0.03
    - Zinc (ppm): 160-260
    - Manganese (ppm): 120-296
    - Iron (ppm): 137-276
    - Copper (ppm): 63-125
- Protein (%): 30.3-39.6
- Fatty Acid Composition (%)
    - Palmitic acid (C 16:0): 6.2-6.5
    - Stearic acid (C 18:0): 3.2-3.5
    - Oleic acid (C 18:1): 34.6-38.0
    - Linoleic acid (C 18:2): 47.2-51.0
    - Linolenic acid (C 18:3): 0.70-0.90
    - Ecosatrienoic acid (C 20:3): 1.5-1.8
    - Total saturated fatty acids (%): 10.0-10.4
    - Total unsaturated fatty acids (%): 89.0-89.6
    - Total monounsaturated fatty acids (%): 35.4-37.2
    - Total polyunsaturated fatty acids (%): 51.7-53.2

1.3. Definition of the geographical area

'Aydın Çam Fıstığı' is produced within the borders of Aydın province. Aydın has been an important settlement centre since ancient times due to its geographical location. Aydın province has 17 districts. These are Efeler, Bozdoğan, Buharkent, Çine, Germencik, İncirliova, Karacasu, Karpuzlu, Koçarlı, Köşk, Kuyucak, Kuşadası, Nazilli, Söke, Sultanhisar, Didim and Yenipazar. In the province, The Koçarlı region produces the most intensive production. Only in the Koçarlı region are there 10000 he of pine trees. The province of Aydın is neighboring Izmir in the north, Manisa in the northeast, Denizli in the east, Muğla in the south, and the Aegean Sea in the west. It consists of mountains stretching perpendicular towards the Aegean Sea and the plains separating them.



Figure 2. Location of Aydın province in Turkey.

Nearly 64% of the province's territory consists of mountains, 15% of plateaus, and 21% of plains. In the north of the province, there are Aydın Mountains extending in an east-west direction. In the south, Beşparmak Mountain, Madran Mountain, Gökbel Mountain, Cevizli Mountain, and Beydağ Mountain extend in a northwest-southeast direction. The Büyük Menderes Plain, which stretches between this mountainous area and toward the Aydın mountains, expands from east to west. The plains have the names of settlements such as Söke Plain, İncirliova, and Nazilli Plain are sections of the Büyük Menderes Plain. To the south, northwest, and southeast is the Çine Plain, irrigated by the Çine Stream; Bozdoğan Plain, irrigated by Akçay; Karacasu plains, irrigated by the Dandalas River. Within Aydın province's borders is Bafa Lake, with an approximate surface area of 60 km^2.

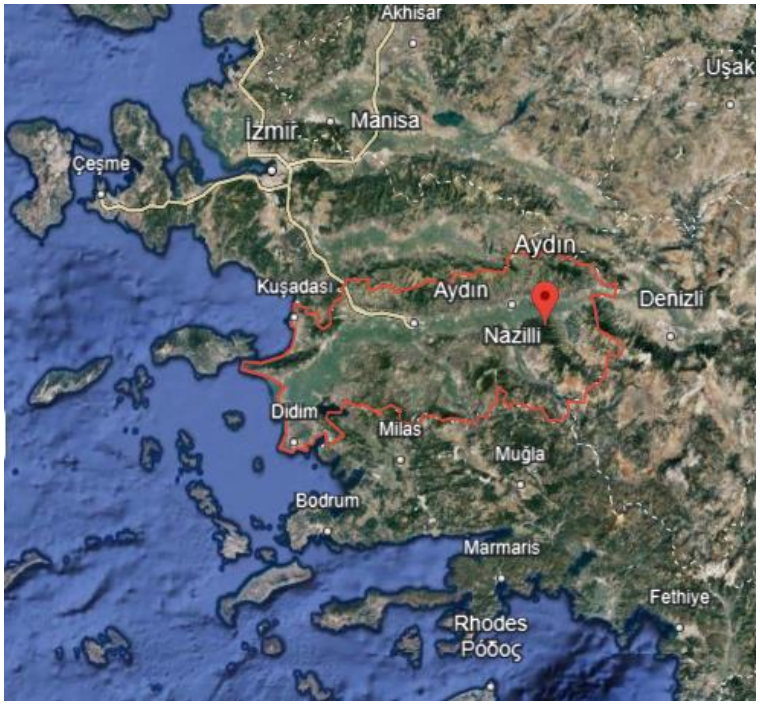


Figure 3. Satellite image of the province of Aydın.

The vegetation in Aydın is characteristic of the Mediterranean climate. Scrub and forest cover nearly half of its surface area. Maquis areas are covered with stunted trees and shrubs. Trees such as oak, sycamore, larch, red pine, pistachio pine, linden, and chestnut cover the forest area.

In the province with a dominant Mediterranean climate, summers are hot and dry; winters are warm and rainy. The Büyük Menderes valley is a groove that opens towards the sea like other Aegean plains. Therefore, the winds that bring a warming effect and precipitation quickly enter the interior. Due to the northern winds, it is cooler than the Mediterranean region.

Figures 4, 5, 6, and 7 give climate data measured between 1941 and 2022 in Aydın province, respectively. The coldest month is February (8.1°C), and the hottest month is July (36.2°C) (Figure 4). The long term average annual temperature is 17,7°C. December and January have the most rainfall, and July and August have the lowest (Figure 5). The long term average annual precipitation is 659,9 mm.Similarly, December-January receives the least sunlight, while July-August receives the most sunlight (Figure 6). The long term annually average daily sunny hours is 6,5. As can be seen from Figure 7, the dominant wind direction of Aydın province is East, and depending on seasonal changes, the dominant wind direction is West-Northwest. May-August is when the wind blows the strongest (1.6-1.8 m/s).

While the relative humidity in Aydın province rises to 75% in winter, it decreases to below 50% in summer. July-August is the month when the relative humidity is the lowest.

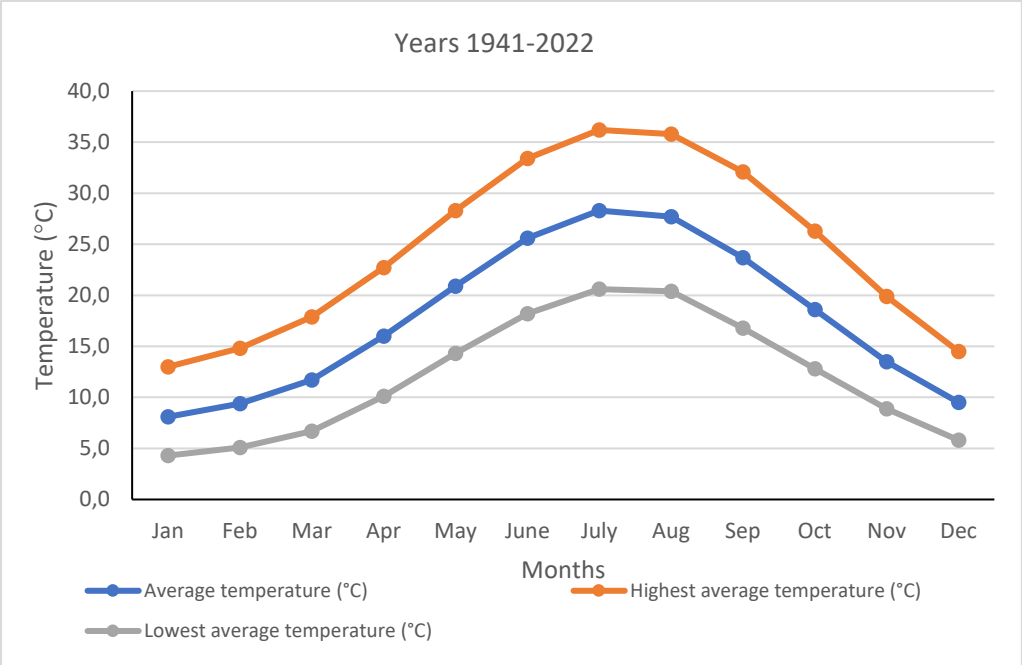


Figure 4. Long term (1941 to 2022) monthly lowest, highest, and average temperature values from in Aydın province.

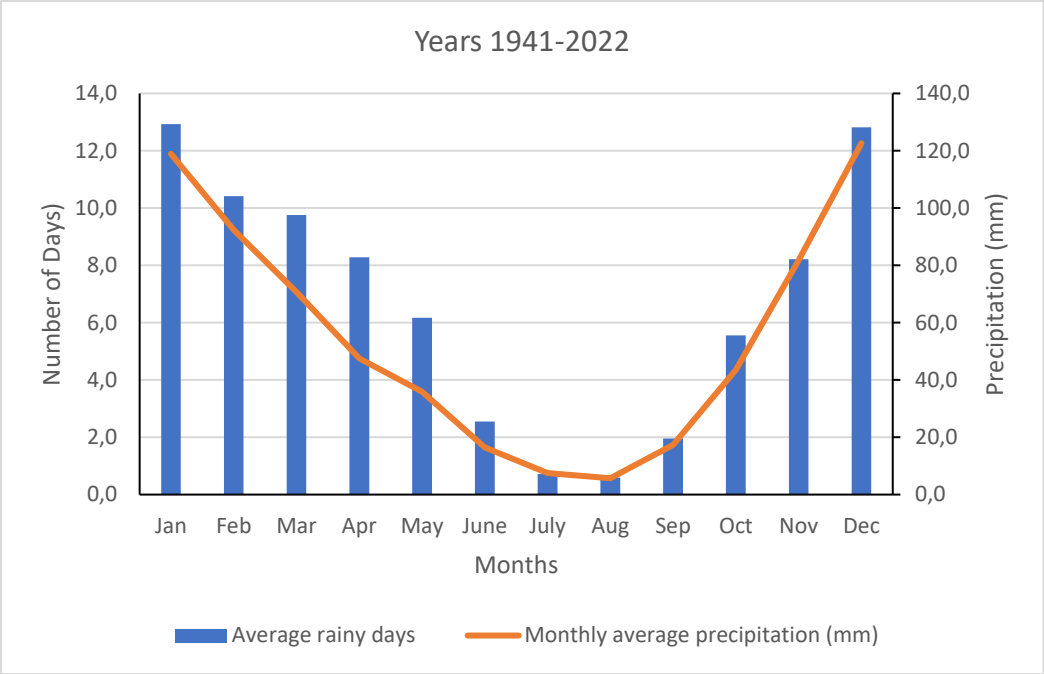


Figure 5., Long term (1942 to 2022) average number of rainy days and rainfall amount per month In Aydın province.

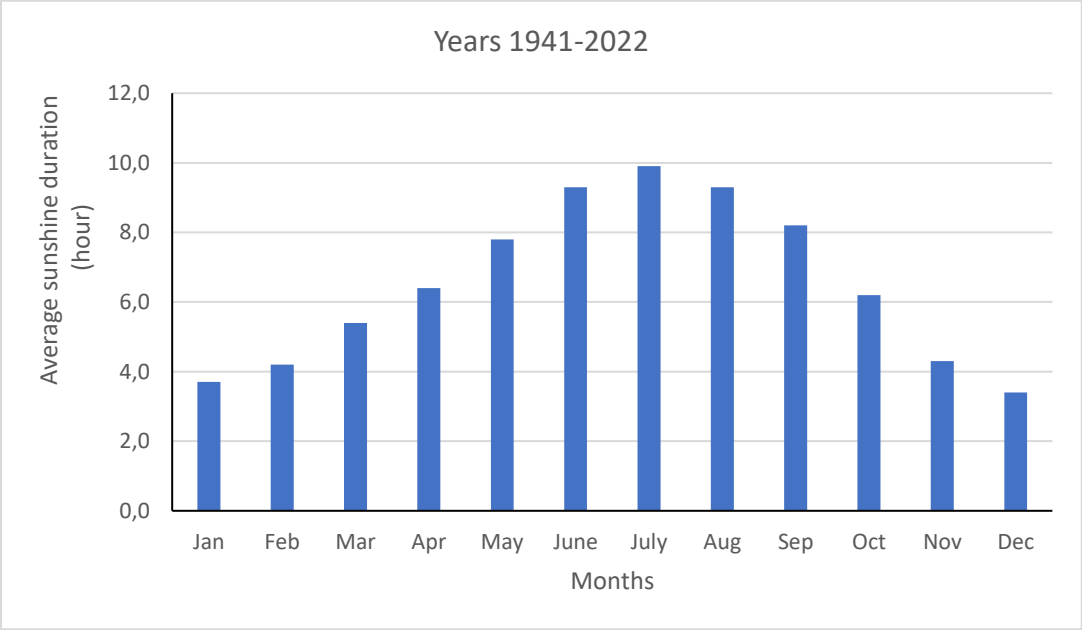


Figure 6. Long term (1941-2022) average number of sunny days per month in the province of Aydın.

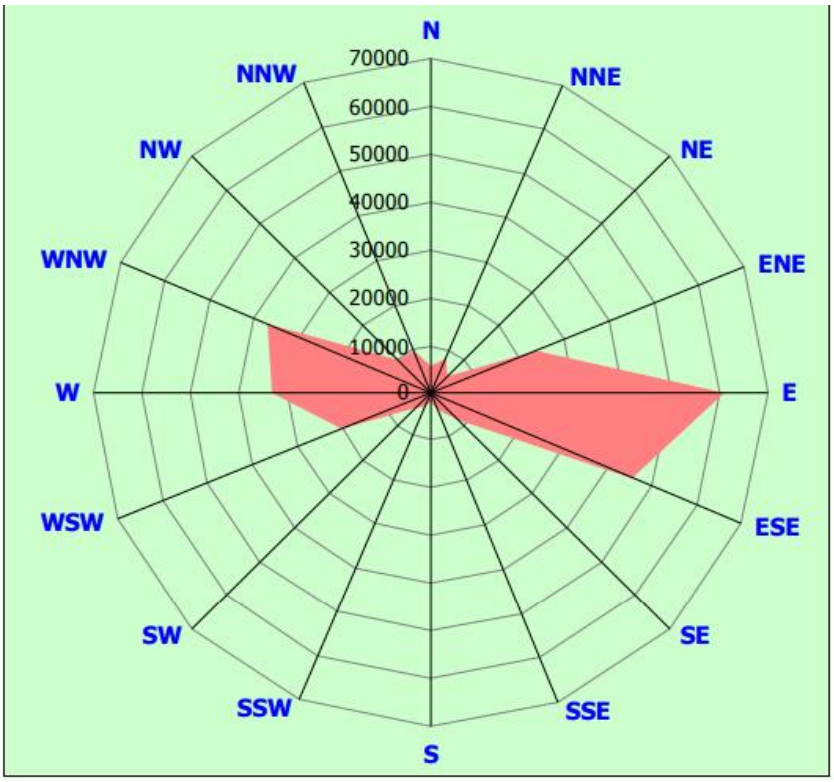


Figure 7. The prevailing winds of Aydının province.

1.4. Proof of origin

Aydın Commodity Exchange keeps records on 'Aydın Çam Fıstığı' producers, production areas, industrial facilities, processing, packaging and storage. The Chamber also performs the duties of secretariat and coordinating the supervisory authority. The basic principle here is to establish a product tracking and traceability system and to carry out periodic inspections and surveillance. Aydın Commodity Exchange will work together with Aydın Provincial Directorates of Agriculture and Forestry, which is an organization affiliated to the ministry and inspects the compliance of the use of geographical indications related to agriculture and food with the characteristics specified in the registration.

The basic traceability system works as follows:

- According to the regulations, Aydın Aydın Provincial Directorates of Agriculture and Forestry has to keep the number of trees and all related information on the producers, such as their location and the number of trees they possess.
- When collected cones are brought the processing plant, a supplier slip is provided with the information of farmers and the amount of cones in mass.
- Each day, production is labelled and recorded as a separate batch which is also printed on the packaging.

- After processing, the producers must write an invoice when the product is transferred to a customer, including the product quantity and consumer information. The producers should also record the invoice with the batch number to ensure traceability. The processor should keep these documents as long as the plant runs.

1.5. Description of the method of obtaining the agricultural product or foodstuff

Growing seedlings: Pine nut seedlings are obtained in two ways. Seedlings are procured from the Turkish Republic of Ministry of Agriculture and Forestry, Aydın Provincial Directorate of Agriculture and Forestry or produced by the producer. Producers collect the largest cones of a fertile tree in June and July, dry them under the sun, allowing the cones to open and depositing the seeds in them. These seeds are planted in October, starting the second week of September. Pits with a diameter and 5-6 cm depth are opened in the ground. One seed is placed in each pit and covered with soil. Next, stones are placed over where the seed is planted to prevent the birds from eating it. Within a week, the stones are removed. During this time, they are sprouted and rise above the ground. Then the seedlings are protected with thorny bushes called *'çığır'*.

Establishment of tree garden: When the seedlings grow, the garden is rearranged and the seedlings in between are cut so that 10-12 m is left between the seedlings. Thus, it is ensured that the trees form a wide canopy and the yield of cones is increased.

Soil and Climate Requirements: 'Aydın Çam Fıstığı ' grow on sandy soil and sandy material lands that receive plenty of sunlight, generally at 0-600 m altitudes. The average annual rainfall is 600-900 mm, the average annual temperature is 17,7°C, and it spreads in areas with a relative humidity of around 70%.

Fertilization: Generally, animals (small ruminants or cattle) graze within the pine nut trees and leave their farm manure. Additional fertilizer is not required. However, 20:20 NP or 15:15:15 NPK fertilizers are used in the first week of February if necessary.

Pruning: The branches of pine nut trees are pruned from November to January to meet the light need and increase the production of cones. Until 40 years at the latest, branches that do not retain fruit due to lack of light, do not benefit from nutrients are pruned. The the inner branches towards the tree trunk is pruned but those orient outwards are left. From the trunk of a tree to the tip of the branches, any small branches within in the first three nodes is comletely removed. Also, pruning of the lower branches is carried out as a natural staircase at the cutting to make climbing easier. Since lower branches carries the male flowers, therefore for pollination, the pruning of lower branches has to be done very carefully.

Irrigation: Pine nut trees meet their water needs from natural rainfall with no additional irrigation.

Agricultural control: Spraying on the pinenut tree is carried out in June or in the first week of July by extending the sprayer's hose operated with the back sprayer or tractor. Contact-systemic drugs are used in spraying.

Harvesting: Flowering in 'Aydın Çam Fıstığı' occurs in April-June with the change according to regions. However, it takes until the following spring for the fertilization event to occur. The cone in this period is the average hazelnut size and takes the name of 1 old cone. Among the people, one-year-old cones are called *'ülker'*. The color of the 'ülker' that remained in this state until the following spring turns brown, and this period, which develops very slowly, is called two-year-old cones. The name of the two old cones among the people is '*kızıl göçmen-göçen*'. The cone, which has a very high water content and takes on a green color from the spring, turns into a completely brown mature cone in the autumn of this year, and three-year-old cones are formed. 'Aydın Çam Fıstığı ' harvesting is carried out from January to April when the cones ripe for three years acquire a reddish-chestnut color. 'Aydın Çam Fıstığı' collected at the end of winter contains higher vegetable oil content than those collected in the early period.

The first harvest of the planted seedlings is carried out after 14-15 years. During this time, the tree can grow up to 10 m.

Cones are harvested by climbing the trunk of trees and using a tool called *'keye*,' an arc-shaped blade attached at the end of a 3-6 m long wooden rod. This work is done by people between 18 and 40 who can climb. To climb, people use long metal stairs produced in the region. Tree height can vary from 6-7 meters to 30-35 m.

Another method of harvesting is mechanical harvesting. In this technique, trunk vibrators are used. Cones dropped on the ground are then collected.

Separation of 'Aydın Çam Fıstığı' from pine cones and shells: To obtain 'Aydın Çam Fıstığı' the shelled pine nuts are first separated from the cones and then from the shells. These operations are carried out in two ways, traditional and modern techniques.

In the traditional method, the collected cones are kept in the garden in piles until June by covering them with branches of cardboard, etc., and kept under the sun until dried and opened. Shelled nuts come out of the cones are collected with rakes. Then, The collected shelled pine nuts are kept in barrels filled with water, and those separated from the bark are collected from the surface. Pine nuts, which are laid on the concrete floor under the sun, are dried by mixing for 2-3 days.

In modern technique, shelled pine nuts are separated the by breaking the cones directly with a cone-crushing machine without laying them in the ground. The shelled pine nuts collected from the pine nut are first washed in the closed system washing pool at 72°C. After washing, they are sorted according to length and broken in the shell-crushing machine. Kernels are then left to dry for 3 days in plastic crates. After drying, the membranes and bran on the pine nuts are extracted in the brushed machine. It is then washed in a unit with 28-32°C water. 'Aydın Çam Fıstığı' is dried in an 80°C drying oven, passed to the cooling unit, and cooled down to ambient temperature.

Storage:. 'Aydın Çam Fıstığı' is stored at 60-70% relative humidity at 0-4 °C for six months.

1.6. Link

Specificity of Geographical Area

'Aydın Çam Fıstığı' trees show a natural spreading area in the region. 'Aydın Çam Fıstığı' trees grow on plateaus irrigated from the Büyük Menderes River in a temperate climate, 70 km inland from the sea, and up to 860 m altitude. The amount of cones in the 'Aydın Çam Fıstığı' tree is 50-60 pieces. The average yield per hectare is 120 kg on average. 'Aydın Çam Fıstığı' trees in Aydın province withstand short-term frosts down to -18 °C. During the flowering period (April-June), which is a critical time in the production of 'Aydın Çam Fıstığı' in Aydın province, the desired temperature and relative humidity conditions are optimal. The Büyük Menderes valley is a groove that opens towards the sea like other Aegean plains. Therefore, the winds that bring a warming effect and precipitation easily enter the interior. Due to the northern winds, it is cooler than the Mediterranean region. There are currently live 'Aydın Çam Fıstığı' trees which are 500 years old.

Since one of the most important conditions affecting the yield of pine nut is pollination, Poyraz blowing from the east and the İmbat blowing from the west increase yield. Also, in the mountain villages, the breeze winds blowing during the flowering period increase pollination.

During summer months, high temperatures and low humidity cause the cones of 'Aydın Çam Fıstığı' to crack open.

Growing at different altitudes, being harvested over a long period, the differences in the ages of the trees and pruning applications, and the fact that the climate is relatively cooler than the Mediterranean climate cause 'Aydın Çam Fıstığı' to have low monounsaturated faty acid content, a less plump body and more crispy compare to other pine nuts grown in Türkiye.

Human factors

'Aydın Çam Fıstığı' production dates back centuries in the region. Manufacturers have developed many traditional techniques both in the production of seedlings and in the harvesting and production of pine nuts. It is possible to list these techniques as follows.

- Cones of three different ages are present on the pine nut tree simultaneously. So, foragers have to collect the correct cone.
- Since the cones very closely attach to the branches, cutting the cones with a special blade without damaging the cones requires human experience.
- Pruning is another essential steps to increase the yield and the quality of 'Aydın Çam Fıstığı'. By correct prunning, the wind and sunlight is permitted to enter the inner part of the pinus trees sufficiently allowing an efficient pollination and fruit growth.
- By soaking in water, 'Aydın Çam Fıstığı' is easily separated from its shell without being damaged. Soaking duration should be carefully observed to prevent excess hydration of shells and inner kernel.

- Drying is essential in order to prevent mold growth and make the 'Aydın Çam Fıstığı' more crispy.

Modern production techniques replace some steps with mechanization, particularly the separation of cones and shells and drying, which yields a similar product to that obtained in traditional methods.

Specificity of the product

'Aydın Çam Fıstığı', are light-dark cream in color, very pointed at the tip, close to dirty yellow at the pointed end, and have a little plump body. Compare to other pine nuts grown in Turkey, 'Aydın Çam Fıstığı' has low monounsaturated fatty acids but high polyunsaturated, especially oleic acid. It is also more crispy than other pine nuts in terms of texture.

Causal link

The climate, being rainy in winter, with lower relative humidity, and high temperatures in summer, gives 'Aydın Çam Fıstığı' its distinctive properties. The prevailing winds create relatively cooler conditions for fruit development. Since one of the most important conditions affecting the yield of 'Aydın Çam Fıstığı ' is pollination, Poyraz winds blowing from the east and the İmbat winds blowing from the west increase yield. Also, in mountain villages, the breeze winds blowing during the flowering period increase pollination in pine nut trees. During summer months, high temperatures and low humidity cause the cones of 'Aydın Çam Fıstığı' to crack open. Growing at different altitudes, being harvested over a long period, the differences in the ages of the trees and pruning applications, and the fact that the climate is relatively cooler than the Mediterranean climate cause 'Aydın Çam Fıstığı' to have low monounsaturated faty acid content, a less plump body and more crispy compare to other pine nuts grown in Türkiye.

Pruning, harvesting, and separation from cones and shells, and drying are the other factors that contribute to the distinctive properties of 'Aydın Çam Fıstığı'.

1.7. CONTROLS

AYDIN COMMODITY EXCHANGE
AYDIN TİCARET BORSASI
Adress : Ata Mahallesi Denizli Bulvarı No:18 09010 AYDIN
Pbx: +902562115000
Fax: +90256211 63 15
E-mail: info@aydinticaretborsasi.org.tr
URL : www.aydinticaretborsasi.org.tr
Tax Office and Tax No: Güzelhisar – 1150083762

REPUBLIC OF TURKEY MINISTRY OF AGRICULTURE AND FORESTRY, AYDIN PROVINCIAL DIRECTORATE OF AGRICULTURE AND FORESTRY (Audit Body)/

Contact Information
Adnan Menderes Mahallesi Yahya Kemal Caddesi No : 2 09010 AYDIN
Pbx : +90256 211 30 00 (4 hat)
Fax : +90256 211 30 10
Web : http://www.aydin.tarim.gov.tr

Republic of Turkey Ministry of Agriculture and Forestry, Aydın Provincial Directorate of Agriculture and Forestry controls whether 'Aydın Çam Fıstığı' has the characteristics specified in Article 1.2 and whether it comes from the geographical area specified in Article 1.3 and whether it is produced according to the production method specified in Article 1.5. and finally checks whether it complies with the labeling requirements specified in Article 1.8.

1.8.Labeling

In addition to the compulsory information provided for by legislation on the labelling and presentation of foodstuffs, labels must include the following:

-The name of the designation 'Aydın Çam Fıstığı',

-Trade name and address or short name and address or registered mark of the producer,

-European Union PDO logo

-The following logo

2. APPLICANT GROUP

AYDIN COMMODITY EXCHANGE
AYDIN TİCARET BORSASI
Adress : Ata Mahallesi Denizli Bulvarı No:18 09010 AYDIN
Pbx: +902562115000
Fax: +90256211 63 15
E-mail: info@aydinticaretborsasi.org.tr
URL : www.aydinticaretborsasi.org.tr
Tax Office and Tax No: Güzelhisar – 1150083762

Aydın Commodity Exchange had been established on the date 10th October 1956 in accordance with the 28th article of the Code on Chambers, Stock Exchanges and Unions with the series number 5174 in the province of Aydın, on a half-official and non-profit basis. It was established

for the purposes of dealing with the sales and purchase of the goods that have been presented to the market in the province of Aydın and the determination of the prices of such goods in the market, their registration and their explanations. Among the conditions for membership in its articles of association, the members should be engaged in agricultural products. Amongst its members, there are some who undertake the production of pıne nut by using the name 'Aydın Çam Fıstığı' and then exporting this product.

Aydın Commodity Exchange could make offers, present petitions and undertake applications before the relevant public authorities in the subjects of its own field of activity. In case there is an interest of some or all of its members, Aydın Commodity Exchange has the right to file cases on behalf of these members or in its own name. It also has services such as following up implementations that could upset competition in the form of agreements, decisions or coherent activities and to report them to the relevant authorities.

Aydın Commodıty Exchange was established in 1956 and has 600 members consisting of merchandisers and industrialists. It is an occupational organization established to facilitate occupational activities of its members and help them in terms of business development and target market. Most members are companies engaged in processing and marketing of agricultural products.

Aydın Commodity Exhchange has applied for the PDO registration of 'Aydın Çam Fıstığı' . This institution follows 'Aydın Çam Fıstığı' producers and observes the activities of their members.

3. TURKISH REGISTRATION OF 'AYDIN ÇAM FISTIĞI '

It was announced in the Official Geographical Indication and Traditional Product Name Bulletin of the Turkish Patent and Trademark Office of the Republic of Turkey, dated 02 August 2021 and numbered 106, that 'Aydın Çam Fıstığı' was registered as PDO.

https://online.turkpatent.gov.tr/trademark-search/pub/#trademark_result_detail

https://ci.turkpatent.gov.tr/cografi-isaretler/detay/610

REFERENCES

Algül, B. E., 2018. *Aydın İli Koçarlı İlçesi Çam Fıstığının Kalite Özelliklerinin Belirlenmesi.* Doktora tezi. TC. Aydın Adnan Menderes Üniversitesi, Fen Bilimleri Enstitütüsü, Bahçe Bitkileri ABD, Aydın. 127 s.

Sen, F., Ozer, K. B., & Aksoy, U. (2016). Physical and dietary properties of in-shell pine nuts (Pinus pinea L.) and kernels. *American Journal of Experimental Agriculture*, *10*(6), 1-9.

Yasar, A., Simsek, E., Bilgili, M., Yucel, A., & Ilhan, I. (2012). Estimation of relative humidity based on artificial neural network approach in the Aegean Region of Turkey. *Meteorology and Atmospheric Physics*, *115*, 81-87.