SPECIFICATION

1.1. Name

“Malatya Kayısısı”

1.2 Description of the agricultural product or foodstuff

Malatya Kayısısı is Hacıhaliloğlu, varietiy under *Prunus armeniaca* L., which is a member of the Rosaceae family. Malatya Kayısısı includes firm-textured apricot fruits with different size and possess rich aroma and sugar content. One of the most significant attributes of the Malatya Kayısısı is that their drying output is really high with levels of 22.2% and 29.8%. 1 kg dried Malatya Kayısısı can be derived from about 3.5 kg fresh Malatya Kayısısı of such drying. The fact that climate conditions particularly during the fruit harvest are perfectly suitable for fruit-drying (that the relative humidity is low and sunlight is abundant) plays a vital role as regards apricot cultivation.

General Characteristics of Malatya Kayısısı: Malatya Kayısısı should be harvested at proper maturity which is suitable for drying and sulphurised, and it has uniform yellow color, specific taste and smell of dried apricots.

Physical characteristics (dried Malatya Kayısısı)

Color: Yellow

Moisture :(% 20-25)

Dry Matter: %75-80

Fruit shape and texture: Oval and fruit flesh thickness is high

Size:

Size no.	0 (Jumbo)	1	2	3	4	5	6	7	8
	Largest								Smallest
1 Kg / Number of Fruit/Dried	Max. 80	81-100	101-120	121-140	141-160	161-180	181-200	201 - 220	Min. 221

Chemical characteristics

Chemical characteristics:

Composition of 100 grams of Malatya Kayısısı: water 25 % (maximum), Energy 200 kcal (minimum), Total sugar 50% (minimum), Total Dietary Fiber 5 % (minimum), Potasium (K) 900 mg (minimum).

Organoleptic characteristics:

Malatya Kayısısı is firm-textured and possess rich aroma and sugar content. After eating, leaves sweet flavour and smell.

.

1.3. Definition of the geographical area

Malatya region is located in the Upper Euphrates basin of the Eastern Anatolia region in Turkey within the latitudes 38°29′03′′N and longitudes 38°08′11′′E. The region has a total area of 12,313 km² and a population of approximately 900,000 people. The population in the city centre equals almost 400,000. Malatya region is at the crossroads of Central, Mediterranean, Eastern and Southeast Anatolia regions. The geography is generally characterised with high plateaus and mountains. Continental climate features are observed in the city.

An extension of Southeast Taurus Mountains, Malatya mountains lie throughout the southern section of the city. Malatya plain, which forms a rough triangle, extends to the north of this area. Although the plain is surrounded by mountains in the north, east and west, the area is not really mountainous. The highest hill in the area is Beydağı with an altitude of 2592 m. The altitude of Malatya is 910 m. The altitude in some parts of Malatya decreases up to 700 m (for instance, Battalgazi, Kale).

In areas where Malatya Kayısısı cultivation is made, soil formation is characterised by slightly alkaline clay-rich loamy soils and loamy soils with high lime contents whose organic substance level is between low and medium. Malatya Kayısısı reach the highest quality level in a restricted Malatya region composed of Malatya city centre and districts, Elazığ-Baskil, Kahramanmaraş-Elbistan, Sivas-Gürün and Adıyaman-Gölbaşı. This geographical area stands out as a location where the highest quality Malatya Kayısısı are produced in largest amounts as well. Climate and soil attributes of this specific area are very similar to one another and species that are grown are composed of cultivars of Malatya Kayısısı.


Harita
Trafik
Türkiye
(Turkey)
Ελλάς
(Greece)
Azərbaycan
(Azerbaijan)
Sevastopol'
Black Sea
Aegean Sea
Sea of Marmara
Mediterranean Sea
Malatya
Elazığ
Adıyaman
Kahramanmaraş
Gaziantep
Şanlıurfa
Diyarbakır
Batman
Siirt
Mardin
Adana
Mersin
Antalya
Konya
Ankara
Sivas
Erzurum
Kayseri
Sivas
Erzincan
Bingöl
Tunceli
Muş
Bitlis
Van
Hakkari
Şırnak
Siverek
Besni
Gölbaşı
Nizip
Kilis
Osmaniye
Tarsus
Kozan
Pozantı
Ceyhan
Dörtyol
Harran
Viranşehir
Kızıltepe
Nusaybin
Midyat
Derik
Mazıdağı
Ömerli
Dargeçit
Kurtalan
Bismil
Çınar
Çermik
Çüngüş
Lice
Hani
Kulp
Silvan
Ergani
Kocaköy
Genç
Karakoçan
Palu
Sivrice
Baskil
Yazıkonak
Keban Barajı
Karakaya Barajı
Atatürk Barajı
Hilvan
Kahta
Gölbaşı
Adıyaman
Besni
Çelikhan
Sincik
Samsat
Gerger
Eğil
Hazro
Ergani
Lice
Hani
Kulp
Silvan

Malatya Provincial Directorate of Agriculture is the expert authority to decide whether an apricot sample is Malatya Kayısısı or not by checking their physical, chemical and organoleptic characteristics and documents.

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

PRODUCTION PROCESSES OF MALATYA KAYISISI:

1- **Production of Malatya Kayısısı saplings:** Malatya Kayısısı are usually produced by *zerdali* (local saplings with smaller fruits and bitter kernel) with T-bud grafting. Saplings reproduced in this manner are offered for sales when they are one or two years old (Asma 2000).

2- **Orchard Establishment:** As Malatya Kayısısı forms large crowns, they should be planted with a distance of 10 m X 10 m.

3- **Sapling Planting:** Malatya Kayısısı saplings germinated with grafts are planted in the autumn (November-December). Saplings are planted in pits of 60 cm depth and 60 cm width in a way that would leave bud eye outside. Then, first water is given to the sapling after planting.

4- **Implementation of cultural maintenance conditions**

Irrigation: Malatya Kayısısı trees are irrigated starting from beginning of June and until the second week of October. Flooding irrigation and surface irrigation are the most commonly used irrigation methods. Number of orchards irrigated via drop irrigation and mini spring irrigation methods has been rapidly increasing in recent years.

Fertilisation: Malatya Kayısısı trees are fertilised with organic manures and synthetic fertilisers in line with leave and soil analysis results. The most common fertiliser types are burned cattle and sheep manure, ammonium nitrate, ammonium sulphate, diammonium phosphate and triple super phosphate.

Pruning: Planting pruning, formative pruning and harvest pruning are implemented onto apricot saplings. Malatya Kayısısı trees are pruned to form a canopy shape or branches are pruned to form canopy shape.

Fight against Diseases and Pests: Pesticides that are permissible with official licenses are applied to diseases and pests existing on Malatya Kayısısı trees.

5- **Harvesting:** Harvest occurs in Malatya Kayısısı at the time when the amount of soluble solid reaches the level of 22-28% for the dried fruit production, and fruit colour completely turns into straw yellow. The Malatya Kayısısı is harvested in the early hours of the day. The soil is covered with clean plastic covers and the trees are vibrated, so the fruits drop onto the covers. As apricots do not ripen in a

homogenous manner on top of trees, fruit harvest is made step by step depending on ripening of the fruits. The Malatya Kayısısı grown on top of trees where the sun is directly faced are those that are first harvested. Then, Malatya Kayısısı in the middle section of the trees are harvested, followed finally by those grown in lower section of the trees.

Malatya Kayısısı possess high fruit quality for table use. Therefore, drying Malatya Kayısısı are also put on the market for table consumption. Harvest generally begins in early July and lasts until mid-August in relation to Malatya Kayısısı. Malatya Kayısısı grown at higher altitudes ripen at a later time of the year.

6- **Sulphuring:** Malatya Kayısısı are dried following sulphur dioxide treatment. Special sulphuring rooms are used during sulphuring process. The dimensions of an ideal sulphuring room are 250 x 250 x 220 cm. The fresh Malatya Kayısısı are placed in wooden and plastic trays inside sulphuring rooms. Malatya Kayısısı which are too ripe or raw and rotten are selected out.The sulphur dust is burnt and melt with a mechanism heated from outside. Melting sulphur starts to be burnt with flaming up. Sulphur gas (S) which is burnt and melted combines with oxygen (O_2) in the room to form sulphur dioxide (SO_2). Once the sulphur starts burning, door of the sulphur room is closed and outside heating is applied until the melted sulphur runs out. Whether the melted and burnt sulphur runs out in the tray is checked through an oven glass installed in the wall of sulphur room. Burning process of the melted sulphur takes around 1-2 hour. When the melted sulphur runs out, outside heating is stopped. In this process Malatya Kayısısı are subjected to sulphur dioxide gas that permeates the room. In order for the gas to fully penetrate the apricots, the sulphuring room is kept closed for 8-10 hours. Door is opened after 8-10 hours and fresh air is thoroughly given in the room. The Malatya Kayısısı are taken outside subsequently.

7- **Drying:** Low relative humidity (25-30%) and high temperature (35-45 °C) observed in Malatya and its surrounding areas create an ideal drying environment during the apricot harvest and drying period. Malatya Kayısısı taken outside of sulphuring room are put into wooden and plastic trays or spread onto clean drying covers that are placed in clean, airy and sunny areas. Fresh Malatya Kayısısı that have been subject to sulphuring process are dried under sun for 3-4 days until their moisture decreases to 40-50%. Then, they are gathered and pits are manually extracted. The fruit is given shape and re-placed onto covers or into trays so that they get further dried. Secondary drying process takes 2-3 days. When the humidity level reduces to 20-25% in dried Malatya Kayısısı, they are sent to either marketplace or storehouses.

8- **Storage:** After the completion of drying process, dried Malatya Kayısısı are stored in storehouses furnished with cold air equipment or in normal storehouses. Storage period changes depending on amount of sulphur and humidity volume in dry apricots. As the dosage of sulphur increases, storage life becomes longer. Malatya Kayısısı that are stored at a temperature of +4 ^{0}C and under cold storehouse conditions can be kept for really long periods. Dried Malatya Kayısısı composing sulphur at a dosage of 2000 ppm can be stored in ordinary storehouses for one year without any problem, whereas they can be kept for 2-2.5 years under cold storehouse conditions.

9- **Marketing:** Fresh and dry Malatya Kayısısı are marketed by export companies operating in Malatya and İzmir. Export prices vary depending on supply and demand conditions.

1.6. Link

In terms of geographical area Malatya Kayısısı reach the highest quality level in a restricted area composed of Malatya city centre and districts, Elazığ-Baskil, Kahramanmaraş-Elbistan, Sivas-Gürün and Adıyaman-Gölbaşı. This geographical area stands out as a location where the highest quality Malatya Kayısısı are produced in largest amounts as well. Climate and soil attributes of this specific area are very similar to one another and species that are grown are composed of cultivars of Malatya Kayısısı. Malatya Kayısısı include hard-fibered apricot fruits with a unique color and size that possess rich aroma and sugar content. A great majority (95%) of Malatya Kayısısı grown in Malatya is for drying purposes and their soluble solid contents vary between 22-28%.

Soil: In areas where Malatya Kayısısı cultivation is made, soil formation is characterised by slightly alkaline clay-rich loamy soils and loamy soils with high lime contents whose organic substance level is between low and medium. Salinity problem does not exist in soils where apricots are grown. Total useful phosphor contents and variable potassium contents of soils are adequate and at high levels. The average value of data obtained as a result of analysis of a number of soil samples, belonging to Malatya Kayısısı orchards in Malatya and its surrounding areas.

Climate:

In the geographical area where Malatya Kayısısı is produced as dried apricot, winters are cold (min – 15 ºC), while summers are hot and arid. The annual average temperature is 14-15^{o}C. The temperatures reaching to 35-45 ^{o}C in ripening and drying periods are highly significant for drying of Malatya Kayısısı and humidity is about 25-30%. Average annual precipitation of the region is 350-400 mm. In the ripening and drying season, the weather must be arid and cloudless. Because rain is the major factor that deteriorates quality in dry apricot. What makes Malatya Kayısısı different from other apricots is that the area in question is a special geographical area and high-quality apricot cultivars which have perfectly adapted to the geographical area exist together. Apricot trees require a dry and hot summer as well as a wet and cold winter.

Hot and dry climate conditions prevailing during fruit development and ripening period are necessary for cultivation of fruits with high sugar content. The high contrast in temperature between daytime and night time during the ripening period contributes significantly to the formation of Malatya Kayısısı' sugar content. When attempt is made to cultivate Malatya Kayısısı in different areas, material quality losses occur in the fruits depending on changing ecological conditions. Such losses can be summarised as low yielding capacity, low soluble solid content, smaller fruit size, low drying output and low fruit quality. These facts reveal that apricots cultivated in Malatya are different from those grown in other areas. The fact that climate conditions particularly during the fruit harvest are perfectly suitable for fruit-drying (that the relative humidity is low and sunlight is abundant) plays a vital role as regards apricot cultivation.

Human Factors: Production, harvesting, sulphuring and drying of Malatya Kayısısı have been performed through the same conventional and natural methods for many years in the region. The quality of Malatya Kayısısı comes from some specific processes mentioned in **description of the method of obtaining the agricultural product or foodstuff section (1.5)**.There is about 8.000.000 apricot tree in Malatya region. Almost all farmer family in Malatya region grows apricot. And so, the economy of the Malatya region almost totally depends on apricot growing and trading. Almost all farmer in Malatya region well know how they grow, prune, irrigate, harvest, dry, pitting, sulphuring and storages steps. All these experiences have been transferred from generation to generation. All process mentioned above requires a particular workmanship, labor and specialization. When a farmer grows or produces Malatya Kayısısı, if made a mistake in sulphuring, drying or storing steps, its result would be irreversible and farmer could lost all product. All farmer considers these risks and easily conduct all process thanks to their experience. All farmer growing apricot in Malatya region knows how deal with these steps, because they grow up apricot farm i.e totally apricot growing environment. Malatya Kayısısı production has become such an art for the citizens of the region that they taught and they continue to teach the details of this work to their children at early ages. Children being informed from the early ages in this way and always taking part in production, harvest and drying an sulphuring of apricot with their families will become experienced workmanship and specialist producers in the future.

1.7. Name and address of the authorities or bodies verifying compliance with the provision of the specification [Article 11/*R.510*]

MALATYA CHAMBER OF COMMERCE AND INDUSTRY –Coordinator
Malatya Chamber of Commerce was established in 1928 and has 6500 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.

MALATYA CHAMBER OF COMMERCE AND INDUSTRY
Contact Information
Attention: Secretary General (Genel Sekreter)
MALATYA TİCARET VE SANAYİ ODASI
Niyazi Mahallesi Buhara Caddesi No: 195 44100 MALATYA / TURKEY
Telphone:+90(422) 444 89 44
Fax: +90 (422) 323 77 76
E-mail : tso@malatyatso.org.tr
URL: http://www.malatyatso.org.tr/

MALATYA PROVINCIAL DIRECTORATE OF FOOD, AGRICULTURE AND LIVESTOCK (Expert/Authority)
Contact Information
Karakavak Mah. Ankara Asfaltı 7.km 44200 MALATYA
Phone +90422 238 01 48-49
Fax 0422 238 14 35
http://www.malatya-tarim.gov.tr

E-mail : bilgi@malatya-tarim.gov.tr
Malatya Provincial Directorate of Food, Agriculture and Livestock committee uses the below mentioned necessary review order while conducting to decide whether apricots are Malatya Kayısısı or not.
First row: Shape of fruit, weight of fruit, color and texture of fruit.
Second row : Smell, aroma and taste analysis.
Third row : Moisture, sugar, mineral, vitamin, fat, protein energy etc. analyses.

Verification of all the characteristics of the product as described in the specification (point 1.2), that the product comes from the geographical area defined in the specification (point 1.3), that the method of production as described in the specification (point 1.5), that the labelling rules established in the specification (point 1.8) are carried out by Malatya Provincial Directorate of Food, Agriculture and Livestock.

1.8. Labeling

The following information must be written or printed legibly and in an indelible manner on the packaging of Malatya Kayısısı:

- The trade name and address, short name and address, or registered trade mark of the company,
- The lot number
- The name of the goods – Malatya Kayısısı,
- Size no
- The following logos





1.9. Additional requirements

ACCOMPAYING INFORMATION

PDO

COUNTRY OF ORIGIN

TURKEY

APPLICANT GROUP

MALATYA CHAMBER OF COMMERCE AND INDUSTRY

Adress:
MALATYA TİCARET VE SANAYİ ODASI
Niyazi Mahallesi Buhara Caddesi No: 195 44100 MALATYA / TURKEY
Telphone:+90(422) 444 89 44
Fax: +90 (422) 323 77 76
E-mail : tso@malatyatso.org.tr
URL: http://www.malatyatso.org.tr/

PROOF OF PROTECTION IN THE COUNTRY OF ORIGIN
Government launched the national procedure with the registration for recognising "Malatya Kayısısı"as a PDO in offical Gazette of the Turkish Republic dated 28.01.2001 and numbered 24301. And Turkish Patent Institue's website
http://www.turkpatent.gov.tr/dosyalar/cografitescil/32.pdf

REFERENCES

Açkurt F., 2008. Sağlıklı Beslenmede Kayısının Önemi ve Yeni Kayısı Ürünleri. Otlu, A., Öztürk F., Asma, B.M. (Ed.) Kayısının İnsan Sağlığına Etkileri Konusunda Yapılmış Bilimsel Araştırmalar. Malatya

Akın, E.B., Karabulut, I., Topcu, A., 2008. Some compositional properties of main Malatya Apricot (Prunus armeniaca L.) Food Chemistry,107 (2008) 939-948.
ve ark. 2008
Asma, B.M. 2000. Kayısı Yetiştiriciliği. Evin Matbaası Malatya

Asma, B.M., Birhanlı, O. 2004. Mişmiş. Evin Ofset. Malatya.

Asma, B.M., 2007. Malatya: The World's Capital of Apricot Culture", Chronica Hort. 47: 20–24.

Cabaroğlu, T., Asma, B.M. Malatya'da Yetiştirilen Bazı Yerli Kayısı Çeşitlerinde GC-MS-Olfaktometri Teknikleri ile Aroma Maddelerinin Belirlenmesi ve Kurutma İşleminin Aroma Maddeleri Üzerindeki Etkisinin Araştırılması TUBİTAK 105 G 077,107O552 Nolu Proje Ara Raporu.

Craig, W., 1997. Phytochemicals: Guardians of Our Health, J Am Diet Assoc., 97, Suppl., 2, 199-204.

Güçlü, K., Altun, M., M. Özyürek, S. E. Karademir, and R. Apak, 2006. Antioxidant Capacity of Fresh, Sun Dried and Sulfited-Dried Malatya Apricot (Prunus Armeniaca) Assayed by CUPRAC,ABTS/TEAC and Folin Methods, *International Journal of Food Science and Technology*, 41, 76-85.

Fotoi N., Maydani M., Santos M.S., Meydani N., Hennekes H.C., Gaziano J.M., 1996. Carotenoid and Tocopherol Concentrations in Plasma, Peripherail Blood Monoclear Cells and Red Blood Cells After Long-Term Beta Carotene Supplementation in Men, Am. J. Clin. Nutr,, 63, 553-558.

Hacıseferoğulları, H., Gezer, İ., Özcan, M. ve B.M. Asma, 2007. Post Harvest Chemical and Physical-Chemical of Some Apricot Varieties Cultivated in Turkey", *Journal of. Food Engineering* 79: 364-373 (2007).

Larsson, S. C., Bergkvist, L., Näslund, I., Rutegard, J., Wolk, A. 2007. Vitamin A, Retinol, and Carotenoids and the Risk of Gastric Cancer: A Prospective Cohort Study. Am. J Clin. Nutr., 85, 2, 497-503.

Löker, G.B., Açkurt, F., Amooutzopoulos, B., Alaşalvar C., 2008. Fonksiyonel Gıda Olarak Taze Ve Gün Kurusu Kayısının Bazı Fizyolojik Özelliklerinin Belirlenmesi Ve Sağlıklı Beslenme Açısından Değerlendirilmesi-Klinik Araştırma. Otlu, A., Öztürk F., Asma, B.M. (Ed.) Kayısının İnsan Sağlığına Etkileri Konusunda Yapılmış Bilimsel Araştırmalar. Malatya

Löker, G.B., Açkurt, F., Amooutzopoulos, B., Alaşalvar C., Erdoğan, Ş., Işık, T., Tekel, M. 2008. Kayısının Sağlık ve Beslenme Açısından Değerlendirilmesi Klinik Uygulama. Otlu, A., Öztürk F., Asma, B.M. (Ed.) Kayısının İnsan Sağlığına Etkileri Konusunda Yapılmış Bilimsel Araştırmalar. Malatya

Noakers M., Clifton P., Ntanios F., Shrapnel W., Record I., Mc Inerney J., 2002.An Increase in Dietary Carotenoids When Consuming Plant Sterols or Stanols is Effective in Maintaining Plasma Carotenoid Concentrations, Am. J. Clin. Nutr., 75, 79-86.

Olszewska M, Glowacki R, Wolbis M, Bald E., 2001. Quantitative Determination of Flavonoids in the Flowers and Leaves of Prunus Spinosa L. Acta Pol Pharm, May, Jun 30, 58, 3, 199-203, PMID, 16270.

Rapaille, A., Goosens, J., Heume, M., 2003. Sugar alcohols. (Caballero, B., Trugo, L.C., Finglas, M, Editors). In Encyclopaedia of Food Sciences and Nutrition, 5665-5671, Oxford, UK, Academic Press.

Yılmaz K. U., 2008. Bazı Yerli Kayısı Genotiplerinin Fenolojik, Morfolojik ve Pomolojik Özellikleri ile Genetik İlişkilerinin ve Kendine Uyuşmazlık Durumlarının Moleküler Yöntemlerle Belirlenmesi. Çukurova Üniversitesi, Fen Bilimleri Enstitüsü, Bahçe Bitkileri Anabilim Dalı, Doktora Tezi, Adana-TÜRKİYE.

Vardı, N., OztUrk, F., Gül, M., Parlakpınar H., Çetin A., Otlu, A. 2008. Potent protective effect of apricot and b-carotene on methotrexate-inducedintestinal oxidative damage in rats. Food and Chemical Toxicology. 46 (2008) 3015-3022.

Parlakpınar, H., Olmez, E., Acet, A., Ozturk F., Taşdemir S., Ateş B., Gül, M., Otlu, A. 2009. Beneficial Effects of Apricot-Feeding on Myocardial Ischemia-Reperfusion Injury in Rats. Food And Chemical Toxicology 47 (4) 802–808.

Wallström, P., Wirfält, E., Mattisson, I., Gullberg, B., Janzon, L ., Berglund, G., 2003. Serum β-Carotene and α-Tocopherol in Smokers and Non-Smokers—Associations with Food Sources and Supplemental Intakes, A Report from the Malmö Diet and Cancer cohort, Nutrition Research, Volume 23, Issue 2 , Feb. 163-183.