

REVIEW ARTICLE

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Identity of cheese: a research on the cheeses of the Aegean Region in Turkey

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Abstract

Cheese, which has a deep-rooted history, is a food product that reflects the cultural memory and history of communities, besides being a method of preserving milk. Cheese varieties differ according to the cultural structure of the countries, climatic conditions, animal diversity, and production techniques. Different types of cheese are produced in different ways in different geographical regions of Turkey. The Aegean Region, one of the geographical regions in Turkey, stands out with its unique cheese varieties. The current study aims to identify cheeses produced in the Aegean Region and to discuss them in the context of gastronomy tourism and cultural heritage. For this purpose, a document analysis was carried out in order to provide information about the identification and production methods of cheeses specific to the Aegean Region. As a result of the review of the documents, cheeses peculiar to the region were put forward.

Keywords: Cheese, Gastronomy, Tourism, Culture

Introduction

Turkey embraces various unique and authentic cultural values [1]. One of the most important indicators bringing the different cultural values to the forefront is the traditional foods and regional cuisines of the countries [2]. Cuisines have been through different developmental processes depending on various factors such as customs and traditions, socio-cultural elements, and welfare status of communities. In addition, the displacements caused by the struggles of people to find a permanent residential place and migration movements also play a major role in the formation of culinary culture in a region [3].

Traditional foods not only play an important role in the establishment and development of food cultures and consumption habits of communities [4] but also are of great importance to reflect cultural wealth [5].

Especially in recent years, tourists have started to demand trips that appeal to all senses instead of those appealing only to the visual senses. This trend has

rendered the regional cuisines important for the recognition and development of destinations [6]. The visits by tourists who have a special interest in palate have paved the way for the emergence of the concept of “gastronomy tourism” [7]. In Turkey, festivals and similar events come to the forefront in the scope of gastronomic tourism activities [8]. The most common products available in local gastronomy events in Turkey are local foods such as grapes and vintage products, cheese, vegetables, olives, and olive oil [9]. Cheese is one of the essential foods for tourism and gastronomy, in addition to cultural wealth and nutritional content. Various cheese-themed activities and events such as Slow Cheese Festival (Bodrum), Göle Yellow Cheese Festival, National Cheese Festival of Turkey, and Çemişgezek Berry and Cheese Festival have been organized in Turkey in recent years [10]. Therefore, cheese is a gastronomic element of great value.

Conceptual framework

History of cheese

Cheese is the overall name of fermented dairy products produced in a great variety of flavors, textures, and forms all over the world [11]. According to the Turkish Food Codex Communiqué on Cheese, cheese is defined

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as “dairy products that are produced by way of coagulating the raw material with a suitable coagulator and of draining off the whey protein from the coagulated material (curd), in different hardness and fat content, unsalted or salted with brine or pure salt, with or without the use of starter culture, boiling or not boiling the curd, with or without spices, with the use of appropriate production techniques, and that are consumed ripened or unripened and reflect unique characteristics based on the variety” [12]. The word “peynir” in Turkish originates from Persian and it was first encountered in Turkish dictionaries prepared by Egyptian Mamluks and in ancient Anatolian papers. In the dictionaries prepared in Egypt, such phrases as penir, benir, and beynir refer to cheese.

Many historical works also contain information about cheese. In the *Divânü Lûgati't-Türk* by Kaşgarlı Mahmut, the phrase “süt kayuklandı” means that the milk got creamy, and it is seen that the words of *udma* and *udhit* correspond to cheese. These Uighur-origin words mean “put to sleep”, “wait with yeast”, or “solidify”. Cheese varieties are also mentioned in *Kutadgu Bilig* by Yusuf Has Hacib (1069) and in the book of *Dede Korkut*. It is known that a type of cheese made from sour milk is called “sogut” in the Karluk dialect [13].

Cheese in Turkish culinary culture

Dairy products have played an important role in human nutrition for nearly 8000 years and have been a part of official dietary recommendations in many countries around the world. Milk has a content rich in carbohydrates, protein, calcium, fat, vitamins, potassium, phosphorus, and minerals that are needed by humans [14]. The cheese in Anatolia varies at a great extent according

to the geographical features of the regions, the breed of milk-providing animals, the production techniques used, the plant diversity of the region, the cultural differences, and the practices peculiar to the region [15, 16]. In Kamber's study (2015) on the variety of cheese produced in Turkey, more than 130 different types of cheese were identified [17].

In terms of geographical features, the Aegean Region is characterized by peninsulas and small bays located onto the Aegean Sea. The valleys in the Aegean Region are fertile and eligible for agriculture; therefore, the cattle graze in hollow areas while sheep/goats graze in mountainous areas. These advantageous conditions have paved the way for the use of ewe's and goat's milk in cheese-making in the region [18, 19]. In the Aegean Region where industrial livestock breeding is quite common, 12 to 16 types of cheese (Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12) have been identified, namely, Tire Çamur cheese, Koponesti cheese, İzmir Teneke Tulum, Posa cheese, Kırtokmak cheese, Kirlihanım cheese, Kuru Çökelek cheese, Afyon Tulum, Sepet cheese, Karaburun goat cheese with curd, and Kuru Ezme cheese [18].

Aegean Tulum cheese

Tulum cheese originates in Turkish culture and is traditionally made by being placed into handmade dried goat or sheep skin. Tulum cheese, one of the five local cheese groups in Turkish culinary culture, is made from raw ewe's and/or goat's milk or a mixture of milk obtained from both. Tulum cheese varies according to traditional family recipes and to the region it is produced [20]. Aegean Tulum cheeses are produced by different methods than other Tulum cheeses in Anatolia [13]. These Tulum cheeses are largely produced in Manisa



Fig. 1 This traditional cheese which is made of raw ewe milk in the fertile meadows of the Aegean Region is produced by means of the application of the maturation process in which the cheese is matured in brine in sheepskin. Nowadays, this maturation is facilitated through the mixture of goat's and cow's milks into sheep's milk in canisters. However, sheepskin bryndza is still produced in small amounts in villages. Differently from feta cheese, the slightly yellow colour of bryndza cheese and the pores on it are the indicators of its upper-level quality. In the Aegean Region, this cheese is eaten at breakfast, inside pasta and salads. (Aegean Tulum cheese. Ödemiş. January 20, 2020)



Fig. 2 The production of Afyon bryndza cheese involves the use of the cheeses that are produced in meadows by the owners of the animals. Afyon bryndza cheese can be made of solely sheep or solely cow milk as well as their mixture of equal quantities. The cheese which is dry-salted is stuffed into the shaved side of lamb or sheep skin. Afyon bryndza cheese should be consumed after initially being matured at 18–20 °C for 7 days, then at +4 °C for 90 days. (Afyon Tulum Cheese. Afyon, February 10, 2020)

and Aydın, particularly in İzmir. They are pretty common in Dikili, Bergama, Ödemiş districts of İzmir; Kula, Akhisar, Alaşehir, Turgutlu districts of Manisa; and Söke, Germencik and Çine districts of Aydın. Those made in Bergama and Ayvalık come to the fore with their unique flavour. Tulum cheese is named as Teneke (Tinned) Tulum or Salamura (Skinned) Tulum cheese according to the material it is packed with. Teneke Tulum cheese is produced in dairies or factories, while Salamura Tulum cheese is produced in villages and stored in animal skins [21].

Afyon Tulum cheese

Afyon Tulum cheese is prepared by being placed into the pre-shaved animal skin. Fresh whole-fat or semi-skimmed and generally unsalted cheeses and Tulum cheeses are used for its production. These cheeses are set aside in cold water in large cauldrons so that the acidity and bitterness are drawn out. The cheeses taken out of the cold water are drained with the help of cheesecloth, then broken into walnut-sized pieces by hand and salted. The salted cheeses are placed into tulum (animal skin). Afyon Tulum cheese matures in



Fig. 3 Sepet cheese is a kind of cheese which is produced in the vicinities of İzmir close by Aegean Islands, in Ayvalık, Karaburun, and Çeşme. Basket cheese is made of sheep's milk in Ayvalık and is called kelle cheese in the region. Around Karaburun and Çeşme, it is made of goat's whole milk and it is consumed fresh, without much maturation. While this cheese was once placed in baskets made of reeds, nowadays, it is shaped in plastic containers with a hole at the top of them. (Sepet Cheese. Karaburun, January 29, 2020)



Fig. 4 It is a special cheese type particular to the Karaburun Peninsula. Kopanisti cheese has reached to the present by being produced mostly by the Greek and then being learnt by the community living in the villages around as a result of common living. Kopanisti cheese starts swelling and giving out its smell as it gets rubbed. This act of rubbing gains Kopanisti cheese a strong odor and aroma. This cheese made only of goat's milk is generally consumed as an appetizer. (Kopanisti Cheese. Karaburun, January 29, 2020)



Fig. 5 Posa cheese is a kind of cheese which is produced by the Turks in Kos Peninsula, also known by the name İstanköy, which is located on the Aegean Sea. This cheese, which is the distinctive feature of the peninsula, is named after “póssia” or “krassotíri”, meaning matured in the sediment of wine. The making of this cheese is facilitated through the use of raw goat or sheep milk. Posa cheese is stuffed in wickerwork cylinders. Upon getting salted, it is lain into the sediment of wine which has piled up at the bottom of a wine barrel. This way, the outer side of the cheese interacting with the sediment of the wine gets the colour of the wine and gets stiffened. (Posa cheese. *Journal of Metro Gastro*, 2015)



Fig. 7 The curd cheese which is consumed after being dried is called the Kirlihanım cheese. During the process of maturation, mould growth begins on the outer face of the cheese. However, this does not penetrate into the cheese, and the inner part keeps its white colour, which is the reason why this cheese is called Kirlihanım. This cheese can be eaten with the mould on it, or with the mould layer having been cut off. In the latter state, the cheese is soft, and it may be eaten after it has been baked in the oven. It is one of the rare cheeses of Anatolia due to its production of scarce frequency. [Kirli Hanım Cheese. www.akkizhanotel.com/tr/kirli-hanim.html]



Fig. 6 Armola cheese comes from the yoruk culture. It is a kind of traditional cheese that has survived from the times when there was no electricity and when it was difficult to keep milk and cheese fresh. It is a cheese type which is matured via adding yoghurt and milk onto the scratches of the İzmir bryndza cheese leftover on skin. Armola cheese is consumed accompanying the afternoon tea, with thyme and olive oil drizzled on the top of it, or by getting scattered on tomato salad. (Armola cheese. *Seferihisar*, January 26, 2020)



Fig. 8 This cheese which is produced in a town of İzmir called Tire goes by the name of this town. It is an endemic kind of cheese which is eligible to be spread on bread. The traditional making of the Tire çamur cheese is achieved through the mixing of matured canister bryndza brine and curd cheese. While goat's and sheep's milks were used once while producing this cheese, today, cow's milk is used. This cheese consumed by the locals is generally enjoyed during breakfast. (Tire Çamur Cheese. *Tire*, January 28, 2020)



Fig. 9 Kuru Ezme cheese is produced in the Aydın province of the Aegean Region. Kuru Ezme cheese comes into being after the scratches of feta cheese and bryndza cheese are processed in a machine and pressed into a pattern and made to wait between 6 and 12 months. At the end of this duration, the cheese does not get moulded. It has a sharp aroma resembling that of the French Roquefort. Kuru Ezme cheese is consumed more in Aydın. (Kuru Ezme Cheese. Aydın, February 20, 2020)

30–45 days depending on the temperature of the place where it is kept in the process of maturation [13, 22].

Sepet cheese

Sepet cheese is produced in Ayvalık, Karaburun, and Çeşme, the districts of İzmir which are located adjacent to the Aegean islands in the Aegean Region. Local residents have learned how to make Sepet cheese from the immigrants who were settled in Ayvalık following the Population Exchange between Greece and Turkey after the Independence War of Turkey. Sepet cheese

made from ewe's milk is known as kelle cheese in the region [18, 23]. Produced by a mix of goat's, ewe's, and cow's milk, the cheese takes its shape in traditional reed baskets called "gova" [19, 24]. For the production of Sepet cheese, whole-fat goat's milk is used and the cheese is consumed rather fresh with minimum maturation [13]. Another type of cheese produced in Ayvalık, Çeşme, and Cunda is Sepet Loru (curd). This cheese, which is said to be transferred from the Greeks to our culture, was used to be put into buckets made of reeds in the past, whereas it is shaped in perforated plastic containers in our day and time. It is made by boiling for the second time the whey remaining after production of Sepet cheese and setting it aside to drain inside the baskets [21, 23].



Fig. 10 It is a kind of cottage cheese which is produced in some of the villages of Milas. Salt and black sesame are added into it, and it is stuffed into a skin by getting kneaded. The cheese which is taken out after 3 weeks gets crumbled and stuffed in a glazed terra-cotta, and the top of it gets closed using grape leaves rolled up by mud. The pot prepared is left to maturation in a half-buried state into the earth. It is both consumed during breakfast and used as stuffing material for patties. (Kırktokmak Cheese. Muğla, February 14, 2020)

Kopanisti cheese

The word Kopanisti means "beaten, smashed" in Greek. Kopanisti cheese, which derives from this Greek word, is a type of curd cheese that has emerged around Çeşme and Karaburun districts of İzmir in the Aegean Region as a product of the cultural interaction of Greeks and Turks [21, 25]. Kopanisti cheese, which requires manual labor and special skills, is more appealing to a specific consumer group due to its heavy aroma and bitter taste, which is similar to that of Roquefort cheese. Rumor has it that Kopanisti cheese was first produced by coincidence. A person intending to store for a longer time the Lor cheese, which was extracted from the whey, kneaded the curd well, placed it into a closed container, and set it aside for some time. Kopanisti cheese is produced by fermenting the curd extracted from the whey of Sepet kelle cheese made from fresh goat's milk. In order to



Fig. 11 It is a kind of cheese made from only goat's milk in the villages of Milas. The aroma of the plants feeding the goats during spring are felt tasting the cheese, and this contributes to the cheese in terms of having a distinctive aroma. Sheep's milk is used alongside goat's milk in the making of the cheese. The cheese is stuffed into canisters and skins with one layer of salt and one layer of cheese following one another, after which process the canisters and skins are closed. It is a type of cheese that stiffens and becomes tasty as it waits in its own juice. (Kazıklı Cheese. Muğla, February 14, 2020)

add some extra flavor, fresh goat's milk can be added to whey and the curd extracted is kneaded in glazed pots. As a result of the kneading process, the kneaded cheese rises, which indicates the start of the maturation phase. The kneading process is repeated every day for a period of 2 weeks to 1 month. When the curd starts cracking on top and a strong smell diffuses, it is kneaded again by adding salt. This process is continued for 10 days with an interval of 3 days. As a final step, the top layer of the Kopanisti cheese is covered with olive oil and it is stored in a jar [13].

Posa cheese

Posa cheese is a cheese made by the Turks settled in Kos Island, also known as İstanköy, located onto the western side of the Aegean Sea. This cheese, which is

peculiar to the island, is called "póssia" or "krassotíri", which means matured in wine dreg. Raw goat's or ewe's milk is used in the production of Posa cheese. Goat milk is set aside for fermentation with its own temperature right after milking. The curd formed after a few hours is filled into straw rollers specially made for Posa cheese and salt is poured on top. Then, it is placed into the wine dreg which has accumulated at the bottom of the wine barrel and is kept in the barrel for nearly 1 month. The wine dreg refers to wine yeast, proteins, and fine grape particles that accumulate at the bottom of the barrel following the fermentation process of wine. Thus, the outer layer of the cheese, which interacts with the wine dreg, takes the color of wine and gets harder [21, 26].

Armola cheese

Armola cheese, which is one of the cheeses sinking into oblivion in the Aegean Region, is produced in Seferihisar, a district officially registered as "Cittaslow", and its neighboring villages [23]. Thanks to the activities carried out within the scope of the Cittaslow (slow city) movement in Seferihisar, the awareness on Armola cheese has increased and small-scale traditional cheese producers have been supported. As a result, the number of cheese producers has been increased [23, 27]. Armola means "leaked out" in Greek. It is said that Armola cheese is a traditional cheese type that originates in the Yörük culture and dates back to the period when there was no electricity, and therefore, it was difficult to preserve milk and cheese [23]. Traditional Armola cheese is produced by adding milk and yogurt to the remaining crumbs of the white cheese and İzmir Tulum cheese and set them aside in goat skin. The goat skin (Tulum) is hung in a shadow and airy place, left for



Fig. 12 It is a kind of feta cheese which is also known as Villager's cheese produced in Manisa. Normally, it is made of whole cow's milk during the months of spring. During the specific periods of the year, it is made by the yoruks on the Yunt Mountain. The cheese that is extracted from its whey is taken out as a piece which is then made to wait between 7 and 10 days and then is ready to be consumed. (Çayır cheese. www.peynirrehberi.com/Cayir-Peyniri,PR-57.html)

draining, and later set aside for 15 to 20 days. The cheese taken out of Tulum is consumed at breakfast by adding thyme, chili peppers, olive oil, and mint on top. It is also widely used in salads and sauces [13, 23].

Kirlihanım cheese

Kirlihanım cheese is produced by Sepet Loru in the towns of Ayvalık, Foça and Karaburun. It is a local cheese peculiar to Anatolia [21]. It refers to the dried version of curd in Ayvalık. The curd with creamy texture obtained from whole-fat ewe's or goat's whey is strained in reed baskets for 1 day. Then, it is taken out of the basket, covered with a thin layer of salt, and left to mature in a cool place. The mould starts growing on the outer layer of cheese in 15 to 20 days; however, the inner layers remain white. Therefore, it is called "Kirlihanım" (Dirty Lady). Due to the fact that there is no widespread production of this rare cheese of the Aegean Region, it is among the lesser-known cheeses of Anatolia [13, 23].

Tire Çamur cheese

This cheese produced in Tire, the town of Izmir, is named after the town. It is a local cheese suitable for spreading on bread. It is produced by blending together Lor Cheese and brine from mature tinned Tulum Cheese. In the past, ewe's and goat's milk was used for the production of this cheese but cow's milk is more often used in its production today. It is mostly consumed by local people at breakfast [21].

Kuru Ezme cheese

This cheese is produced in Aydın from the crumbs of white cheese and Tulum cheese which are passed through a mincer and placed into molds and set aside for 6 to 12 months. No mould grows on the cheese but its taste is very sharp, similar to that of Roquefort cheese [13, 21].

Kirktokmak cheese

It is a kind of curd cheese produced in certain villages of Milas. Yoghurt made from cow's, ewe's, or goat's milk is churned and the leftovers are heated. The curd is put in cheesecloth and strained off. Then, it is kneaded with salt and black seed and placed into animal skin. The cheese is taken out after 3 weeks, broken into pieces again, and placed into a glazed earthenware pots. The top layer is covered with vine leaves and plastered with mud. The pot's two thirds of which are buried in the ground and upside down and left for maturation for 2 to 3 months in a cool and dark place [13, 21].

Kazıklı cheese

It is a type of cheese produced only from goat's milk in the villages of Milas. This cheese is characterized by a unique aroma. This aroma stems from the goat's eating plants (hedgehog, Bozlak, gum, thyme, etc.) that grow

on the Ilbira Mountain of Milas in spring [21]. Goat's or ewe's milk is fermented for 15 min with rennet made from capricorn syrup. The curd is put in a cloth and hung to drain off. After the whey is drained off, the curd is broken into pieces and stored in tin or animal skin with a layer of salt and a layer of cheese. No brine is added. The cheese becomes consumable after being kept for 1 month in a cold place [13].

Çayır cheese

It is a kind of white cheese produced in Manisa region. It is also known as Köylü cheese (Villager's cheese). It is produced usually in the spring from whole cow's milk. The milk is boiled in the cauldron and then left to reach the suitable temperature for fermentation. The curd obtained as a result of the fermentation process is put into cheesecloth and left to be pressed. Following the straining of the whey, the cheese takes its shape. It becomes ready for consumption after 1 week to 10 days [13].

Methodology

The current study aiming to identify cheeses peculiar to the Aegean Region provided a literature review on cheese. First, the history of cheese was explained. After highlighting its development throughout the world and in Turkey, the varieties of cheese unique to the Aegean Region were identified and the methods of production were explained.

Conclusion

Gastronomic tourism comprises of the travels carried out in order to taste a particular kind of food distinctive to a destination or in order to see the way a kind of food is made [28]. This domain which looks into the relation between a region and its meals exhibits the significance of especially the local and traditional products [29–31]. The climatic, geographical, and cultural differences each region of Anatolia, the cradle of civilization, displays have become effective in terms of the emergence of various cuisine cultures. In the previous years, Turkey has begun to foreground the cuisine cultures and cultural varieties it has long born through gastronomic tourism. In these regions, the Aegean cuisine the past of which goes back to 8000 years before and which has been enriched through being transmitted from one generation to another has constituted a prominent cuisine culture with its utterly distinctive being. The multi-cultural social construct (Rum, Greek, Bosnian, Albanian, Crete, Sefarad, Levanten, Anatolian) of the region lies beneath the formation of this cuisine culture [30, 32, 33].

The first thing that springs to mind when the topic is Aegean gastronomy is the street delicacies, the meals with olives and olive oil, meat dishes, green herbs, sea products, and vegetables. However, the Aegean Region is also eminent with regard to the dairy product culture of

Turkey with its vegetation cover, meadows, mountains, sheep, goat, cow, and dairy farms. Especially, cheesemaking is a significant cultural value. Cheesemaking is not only a craft where milk is kept long periods without getting spoilt. This craft enables the production of different types of cheese each with their own distinctive flavours, textures, and forms in the places that display dissimilar geographical and climatic features [34]. Little as the people know with regard to the variety of cheese Turkey has, there exist so many types of cheese embedding distinctive flavours and textures. Consequently, in this study, exertion has been made to draw attention to the riches of the types of cheese each with their own distinct flavour and texture that exist in the Aegean Region and that are produced via traditional methods as a cultural value.

In line with the aim specified, the existent tourism potential of the region and its economical and socio-cultural activities may be facilitated to be supported through the promotion of the region-specific traditional cheese kinds within the framework of gastronomic tourism. Besides, this may be effective in terms of transferring this cuisine heritage to the following generations through the preservation of the traditional producing procedures and the cultural values which make them unique. This might also contribute to the development of cheese festivals in the region and the promotion of the Aegean Region's cheese variety to be promoted and better known on the international level.

As a result of the literature review carried out during the study, it was determined that the diversity of the cheeses that the Aegean Region has is highly immense. The information obtained sets forth that cheese is an important value in the Aegean Region. Thus, it may be stated that the types of traditional cheese have an invaluable gastronomic value. With this regard, within the framework of gastronomic tourism, researches may be carried out to draw a cheese map of the region through the promotion of the cheeses that are particularly produced in the region in the national and international fairs. Various studies or projects may be carried out in coordination with the related departments of universities and the sector in order to be able to raise the recognizability of the Aegean cheeses.

When given a consideration, cheese can reflect on the identity of many cultures due to there being many kinds of cheese made of different animals' milks and each habitat owning distinctive climate, land, and ways to process milk, which gain cheese its peculiar character. At this point, to protect traditional cheeses and their local features, to continue their production will, at the same time, contribute to the protection of the historic legacy, identity, and cultural memory that they embed. As a result, the cheese culture will be able to be passed on to the following generations besides being preserved as a value that might be experienced by tourists.

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Authors' contributions

The authors conceived, wrote, and revised the study and read and approved the final manuscript.

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