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An important cheese in Turkish cuisine: a research on PGI-registered Erzurum civil cheese

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Abstract

Cheese serves as a medium for conveying the identity and culture of the regions where it is produced. This includes the origin of the milk used, pastures enriched with aromatic herbs, natural landscapes, cheese producers, traditional production methods, and consumption rituals. This intricate structure is also closely linked to cheese-focused tourism. Additionally, geographical indication (GI) as an industrial property right provides consumers with quality assurance for registered and protected products while offering economic, social, and environmental benefits to the regions where production occurs. This study aims to highlight the significance of GI-registered Erzurum civil cheese, one of the most prominent elements of Erzurum cuisine, by emphasizing its cultural importance, examining its production stages according to the registration document, and proposing recommendations for its preservation for future generations. Erzurum civil cheese, produced in Turkey's Eastern Anatolia Region, was officially registered in 2009 and is widely consumed across the country.

Keywords Turkish cuisine, Erzurum kitchen culture, Erzurum civil cheese, Gastronomy, Responsible production

Introduction

Cheese, a fundamental component of Turkish breakfast culture and a staple worldwide, is considered one of the most essential dairy products. In recent years, cheese has emerged as a significant niche market, closely linked to tourism, particularly gastronomy tourism, attracting increasing attention from researchers [1–3]. Both cheese and tourism have been among the most studied subjects in recent years. Cheese tourism, a specialized form of gastronomy tourism, is defined as activities involving visits to regions where cheese is produced using natural raw materials, milk production processes, and traditional methods [4]. This form of tourism includes cheese tasting in renowned destinations such as France, Italy, and Spain

[1], witnessing traditional production techniques within their natural landscapes in situ [4, 5], and participating in fairs or visiting cheese festivals [6, 7]. It attracts large numbers of tourists seeking new culinary experiences in regions where cheese production is prominent.

Currently, France boasts more than 350 types of cheese, Italy around 200, Spain approximately 50, Switzerland 20, and the Netherlands 15 [8]. The defining characteristic of these destinations is their status as European Union (EU) countries that effectively implement geographical indication (GI) practices and are rich in gastronomic products [9]. Geographical indication regulations not only protect authentic and unique products, such as cheese, by ensuring their legal registration, but also contribute to the sustainability of production and stimulate tourism in the regions where they are made [10].

In Turkey, there are over 150 types of cheese [11], yet only 32 have been granted GI registration. Transforming this rich culinary heritage into economic value,

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particularly through gastronomy tourism, is expected to extend tourism activity throughout the year and foster regional development. With this in mind, the present study aims to highlight the significance of Erzurum civil cheese, which holds a prominent place in Erzurum cuisine and is the first cheese type in its city to receive GI registration from the Turkish Patent and Trademark Office (TPTO).

Thus, this study seeks to underscore the cultural and culinary importance of Erzurum civil cheese as a distinguished product of Erzurum cuisine and to contribute to its preservation for future generations. Additionally, the study examines whether its production stages comply with the specifications outlined in the GI registration document. Furthermore, another objective is to develop recommendations for promoting this cheese to future generations by assessing producers' knowledge and awareness of GI regulations.

Conceptual framework

Humankind transitioned from a hunter–gatherer society to a settled lifestyle, benefiting from dairy products during the domestication of animals. Although the exact origins of cheese remain uncertain, most sources suggest that it emerged between 8000 and 9000 BCE, with an estimated 2000–4000 varieties of cheese worldwide [12]. Some scholars propose that cheese spread globally from Mesopotamian lands, supported by cheese depictions and figurines found in temples dating back to 7000 BCE and 10,000 BCE [13]. Between the seventeenth and nineteenth centuries, cheese production remained primarily limited to farm-based production. However, the establishment of the first cheese factories in 1851, mainly in Rome and New York, and later in Derby in 1870, marked a new era in cheese production. By 1876, these early industrial developments had introduced new dimensions to cheese production and trade [12].

The word “cheese” is believed to have originated from the Persian term “paniir,” meaning “made from milk,” and later adopted into modern Turkish. Historical records indicate that the words “benir,” “penir,” and “beynir” were first used in Mamluk Turkish. Additionally, in the renowned “*Dīwān Lughāt al-Turk*” by Mahmud al-Kashgari, the term “udma” or “udhitma” was used to refer to cheese [14]. In essence, cheese is a significant food product derived from the fermentation of milk [1].

A country's or region's flavors are deeply intertwined with its culture and identity. These flavors represent the intangible cultural heritage of a destination, offering tourists an authentic cultural experience through gastronomy [15]. Geographical indications (GIs), which contribute to culinary identity and quality assurance, are defined as certifications that associate specific

products with their unique environmental and cultural characteristics, ensuring quality and authenticity. This system is based on the principle that local products must meet established quality standards. The World Trade Organization (WTO) recognized GIs internationally in 1995 following the signing of the TRIPS agreement [16]. Studies indicate that GI certification serves as a quality marker, helping increase cheese sales and positioning regions as attractive tourist destinations [10].

Gastronomy tourism has the potential to support economic development, particularly in rural areas, by promoting both the quality and quantity of local food products. Visits to farms, producers' markets, and participation in agricultural activities (e.g., fruit picking, vineyard juicing) generate significant economic benefits in rural communities [3, 17]. Cheese is among the specialty gastronomic products that contribute to culinary tourism and regional identity [18].

According to data from the Turkish Patent and Trademark Office (TPTO)—the highest authority on geographical indications in Turkey—35 cheese varieties are GI-registered. Notable examples include Ezine Cheese, Malkara Aged Kashar Cheese, Karaman Divle Obruk Tulum Cheese, Edirne White Cheese, and Erzurum civil cheese. This diversity highlights Turkey's significant potential in GI-certified cheese production. Erzurum, in particular, ranks third among Turkish cities in GI registrations, with 55 certified products, including two GI-registered cheese varieties.

Situated in Eastern Anatolia, Erzurum has historically served as a key crossroads on the Silk Road, linking Asia and Europe. This long-standing cultural exchange has shaped Erzurum's cuisine, which has been influenced by Russian, Iranian, and Caucasian culinary traditions. Additionally, due to the harsh winter climate and extended periods of snow cover, animal-based protein sources have become a dominant feature of the local diet [19].

A previous study on France's renowned GI-registered Comté cheese demonstrated that GI certification enhanced market recognition, increased rural producers' incomes, contributed positively to rural development, added value both locally and in exports, created employment opportunities, and promoted tourism while preserving the natural landscape [20].

Another study, conducted in Russia, examined the dynamics of Russia's cheese production centers. The findings revealed that 11 key regions contribute significantly to cheese production, with the Altay and Voronezh regions accounting for three-quarters of Russia's total cheese output. Other notable findings include the presence of private cheese tourism farms, scenic landscapes,

Table 1 Structured interview questions used in the study

| Question No | Question content |
|-------------|------------------------------------------------------------------------------------------------------------------------------|
| 1 | How many years have you been producing civil cheese? |
| 2 | From whom did you learn how to produce civil cheese? |
| 3 | Do you know any historical background or story about civil cheese? If so, can you share it? |
| 4 | Can you provide details about the recipe and production process of civil cheese? |
| 5 | Do you source the milk used for civil cheese production from the Erzurum region or from different regions? |
| 6 | Can you provide information on the fat content of the milk used for civil cheese production? |
| 7 | What are the sequential steps applied to the milk during the production of civil cheese? |
| 8 | What characteristics differentiate civil cheese from other types of cheese? |
| 9 | What is a geographical indication (GI)? Have you heard of it before? If you are familiar with it, can you briefly define it? |
| 10 | Does civil cheese have a GI certification? Can you provide brief information on this subject? |
| 11 | Is there an institution that inspects your civil cheese production according to the GI registration document? |
| 12 | What actions should be taken to promote civil cheese and pass it on to future generations? |
| 13 | Do you use any specific labels or logos when selling civil cheese? |

cheese festivals, and a cheese museum in the Altay region [1].

Similarly, Fusté-Forné [2] conducted a study in Valle de Roncal, a mountainous region in northern Spain, collecting data from cheese production facilities. The study concluded that cheese producers in rural areas maintain strong historical ties with their natural landscapes, and that rural lifestyles contribute to regional tourism development by creating niche markets. Additionally, research indicates that GI-protected cheeses serve as cultural markers, reinforcing the regional identity of various destinations worldwide and attracting tourism [21–23].

Further studies explore producer and consumer awareness regarding GI-registered cheeses and other geographically protected food products [24–28]. However, there is currently no study in the literature that specifically examines Erzurum civil cheese in this context. This research aims to fill this gap by exploring its cultural, gastronomic, and economic significance.

Methodology

Erzurum, where TPTO registers two types of cheese, can be seen as an essential center for cheese production, and cheese tourism can be developed here. This is because of its natural environment and flora. The interview form established to collect data for this purpose involves cheese producers: How long have you been producing civil cheese? What have you learned about the production of civil cheese? What should the characteristics of the milk be, and where do you buy milk? What are the production phases? What distinguishes civil cheese from other cheeses? Do you know what a GI is? Are there any institutions that inspect civil cheese according to the registration certificate? Are any labels on the sale of civil cheese? (Table 1).

Moreover, what can be done to deliver Erzurum civil cheese to future generations? We also included further information and viewed that the participants wanted to share about Erzurum civil cheese. For this reason, a qualitative research method is used to reach in-depth and exploratory answers in cultural studies [29]. Therefore, the study was focused on the authenticity of Erzurum civil cheese in a sense.

This study involves the opinions of the operators designated as “producers” in the records of the TPTO and the Erzurum Commodity Exchange, a registered institution. We used the sampling technique to perform face-to-face interviews with 13 of the Erzurum civil cheese establishments with 17 producers. The share of access to the target universe was 76.4%. The permission for a study was obtained on March 12, 2023, by the Ethics Committee on Social and Humanities at Atatürk University. Meetings with Erzurum civil cheese producers took an average of 30 min. All participants provided informed consent for their responses to be used in this study and published in an academic journal. The interviews were conducted between April 1 and April 30. Thus, content analysis was applied to the answers obtained from the interviews. Content analysis is used to group data objectively and systematically and to determine them by expressing them numerically in the overall analysis of texts [30].

Results

Table 2 presents the demographic characteristics of the 13 participants who manufacture Erzurum civil cheese and are listed as manufacturers at the TPTO and Erzurum Commodity Exchange.

All 13 manufacturers interviewed were male and were found to have produced Erzurum civil cheese between 28 and 35 years, with the majority (46.1 percent) having a

Table 2 Demographics of Erzurum civil cheese manufacturers

| Participants | Gender | Training | Service duration | From whom did he learn |
|--------------|--------|------------------|------------------|------------------------------|
| P1 | Male | High School | 15 Years | Grandfather |
| P2 | Male | High School | 15 Years | From masters who worked with |
| P3 | Male | High School | 24 Years | From father |
| P4 | Male | Undergraduate | 12 Years | From masters who worked with |
| P5 | Male | Primary School | 35 Years | Grandfather |
| P6 | Male | High School | 32 Years | From masters who worked with |
| P7 | Male | Primary School | 28 Years | Grandfather |
| P8 | Male | Associate degree | 30 Years | From father |
| P9 | Male | Associate degree | 24 Years | Grandfather |
| P10 | Male | High School | 30 Years | From masters who worked with |
| P11 | Male | Undergraduate | 8 Years | From father |
| P12 | Male | High School | 26 Years | From masters who worked with |
| P13 | Male | Associate degree | 13 Years | Grandfather |

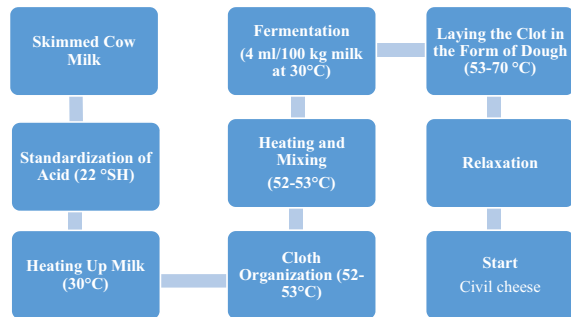


Fig. 1 Civil cheese production stages. Source Compiled by author from www.ci.turkpatent.gov.tr

high school graduate education. In addition, most of the participants learned about production procedures from their grandparents or grandparents and learned about them from the masters they worked with. The learning of cheese production from a big family indicates that the homeland of Erzurum civil cheese is the region.

The practices defined in the certificate of registration of the Erzurum civil cheese production, a local flavor, and the exclusive marking registration phase are listed in Fig. 1. Producing this flavor belonging to the Erzurum region involves a long and labor-intensive process. The oil of the milk produced from the aromatic cows in the Erzurum region is separated by separators. The acidity of skimmed milk is brought to 22° Soxhlet–Henkel (°SH), and the milk is brewed, heated to a temperature of 30 °C slowly. When a temperature of 52–53 °C is reached, clotting begins to form after mixing with a wooden scoop. This mixing procedure continues until the temperature reaches 65–70 °C. At this temperature, the dough begins to form. Then, less deep and stainless chrome is kneaded, drained, and hung on hangers to knead and extend. Leave

it on for about thirty minutes, knead it, and hang it on hangers again. Repeat 3–4 times.

The final process is suspended before the cheese is put on a marble or stainless chrome counter to give it a fibrous structure. The water is drained, and the process begins to wrap after removing the brine.

The sequential phases of Erzurum civil cheese production, as depicted in Fig. 2, outline the standardized procedures followed by manufacturers to ensure compliance with the geographical indication (GI) registration and maintain product quality. The process begins with Phase 1 (Milk Heating), where fresh cow’s milk is heated to the required temperature to initiate fermentation. In Phase 2 (Fermentation), a natural or added culture is introduced, allowing the milk to develop the necessary acidity. This step is critical for achieving the desired texture and flavor. Phase 3 (Heating and Mixing) involves gradually increasing the temperature while continuously stirring, which helps in protein coagulation and uniform curd formation. As the process progresses, Phase 4 (Formation of Clots) occurs, where the curd begins to take shape through controlled agitation. In Phase 5 (Dough Formation), the coagulated mass gains elasticity and starts forming a structured texture. Phase 6 (Water Strain) involves separating the curd from the whey, which is essential for reducing moisture content and achieving the characteristic fibrous structure of Erzurum civil cheese. Phase 7 (Hanging on Hangers) marks the beginning of the stretching and kneading phase, where the cheese is suspended to enhance its elasticity and remove excess whey. Following this, in Phase 8 (Suspension), the cheese is allowed to rest while hanging, facilitating the development of its distinctive layered texture. The process concludes with Phase 9 (Resting), where the cheese is placed on a flat surface to stabilize its final shape and

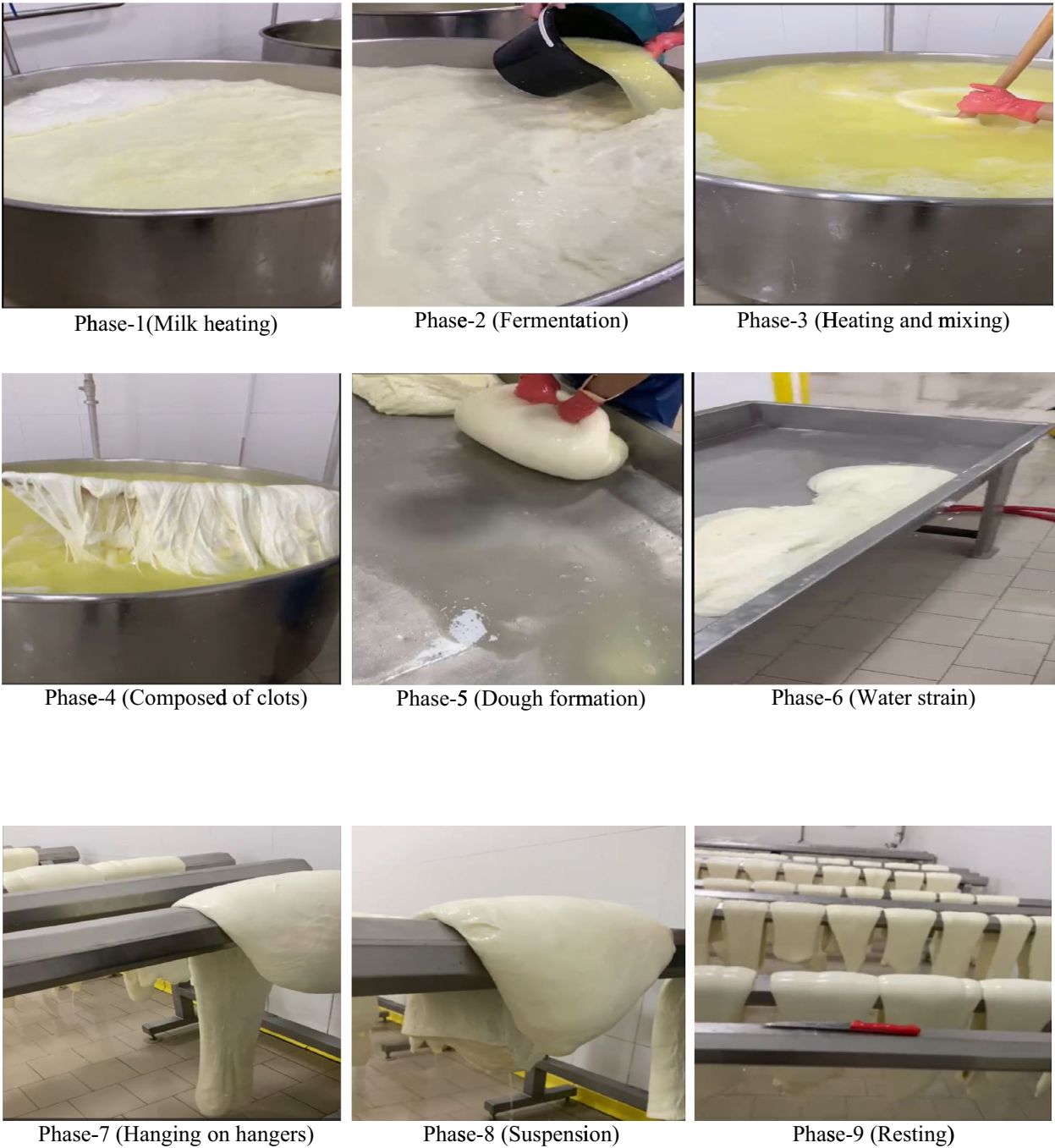


Fig. 2 Sequential phases of Erzurum civil cheese production process. *Source* Photographs taken by the author during visits for interviews

consistency. These steps closely align with the GI registration guidelines, ensuring uniformity and adherence to traditional production standards. The photographic documentation confirms that the manufacturing practices observed are consistent with the registered production methods, indicating a high level of compliance and

product standardization among Erzurum civil cheese producers.

Table 3 provides a detailed overview of the essential attributes of Erzurum civil cheese, including its milk composition, production methodology, and sustainability measures, based on manufacturers’ responses. All participants confirmed that the cheese is made exclusively

Table 3 Erzurum civil cheese manufacturers' responses to production and sustainability

| Category | Question | Responses | Participants mentioning this |
|------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------|
| Milk characteristics | What type of milk is used in Erzurum civil cheese production? | Cow's milk | All participants |
| | What are the required characteristics of the milk? | Must be non-fat | All participants |
| | Where do you source the milk from? | Erzurum region | All participants |
| Production process | What are the sequential steps in the production process? | 1. Heating and fermentation of milk →, 2. Pulverization of the mixture →, 3. Calming | All participants |
| Distinctive features | What distinguishes Erzurum civil cheese from other cheeses? | Oil-free | All participants |
| | | Long shelf life | P4, P6, P1, P12 |
| | | Diet cheese | P2, P5 |
| Sustainability and promotion | What actions should be taken to preserve and promote Civil cheese for future generations? | Raising new apprentices and master artisans | P2, P3, P4, P6, P8, P10, P11, P12, P13 |
| | | Promotion at national and international levels | P1, P5, P6, P7, P9, P10, P13 |

from cow's milk, ensuring consistency with its traditional characteristics and geographical identity. Additionally, all producers reported sourcing milk solely from the Erzurum region, which aligns with the geographical indication (GI) registration requirements and reinforces the local authenticity of the product. The responses indicate that the cheese is universally recognized as fat-free, a feature that differentiates it from other cheese varieties and contributes to its distinct texture and nutritional profile. Some manufacturers highlighted its extended shelf life, with specific participants (P4, P6, P1, P12) emphasizing its durability compared to other cheeses, likely due to its unique production techniques. Others (P2, P5) noted that its low-fat content makes it a preferred choice for consumers seeking dietary options. These findings suggest that the defining characteristics of Erzurum civil

cheese, particularly its fat-free composition and extended shelf life, contribute to both its marketability and its role in traditional gastronomy. The consistency in responses across different manufacturers further supports the standardized nature of its production process and its compliance with GI certification standards, ensuring the preservation of its cultural and economic value for future generations.

Table 4 presents the responses of Erzurum civil cheese manufacturers regarding their awareness, certification, and labeling practices related to geographical indication (GI). The findings indicate varying levels of awareness and knowledge among producers concerning the GI system. While most participants (P1, P2, P3, P4, P6, P7, P8, P9, P10, P11, P13) correctly identified GI as a designation for region-specific products, only a few (P2, P3, P5,

Table 4 Erzurum civil cheese manufacturers' responses to GI information and applications

| Category | Question | Response options | Participants mentioning this response |
|-----------------------------------|------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------|
| Geographical indication awareness | What is a geographical indication (GI)? | A product specific to a region | P1, P2, P3, P4, P6, P7, P8, P9, P10, P11, P13 |
| | | Proprietary certification | P2, P3, P5, P12 |
| | | Do not know | Not mentioned |
| Inspection and certification | Are there institutions that audit GI-registered Erzurum civil cheese? | Ministry of Food, Agriculture, and Livestock | P1, P2, P3, P4, P6, P8, P9, P10, P11, P12, P13 |
| | | Erzurum Commodity Exchange | P2, P13 |
| | | Ministry of Health | P3, P5, P7, P10 |
| Labeling and tagging practices | Do you use any labels or logos for GI-registered Erzurum civil cheese? | Yes, we use our business logo | All participants |
| | | No, we do not use any label | Not mentioned |
| | | Yes, we use a GI privacy logo | Not mentioned |

P12) understood its proprietary certification function. The lack of knowledge among some producers suggests the need for targeted educational programs to enhance awareness of GI regulations, benefits, and responsibilities. Regarding institutional oversight and certification, the majority of participants recognized the Ministry of Food, Agriculture, and Livestock as the primary regulatory body responsible for auditing GI-certified Erzurum civil cheese. However, some manufacturers identified the Erzurum Commodity Exchange (P2, P13) and the Ministry of Health (P3, P5, P7, P10) as additional oversight entities. These discrepancies highlight potential misconceptions or inconsistencies in the understanding of GI governance, underscoring the need for clearer communication between regulatory authorities and producers to ensure compliance with the GI registration document and certification standards.

In terms of labeling and branding practices, all manufacturers reported using their business logos on packaging. However, no respondents explicitly mentioned using the official GI label, despite its role in differentiating certified products and ensuring authenticity. The absence of GI-specific labeling suggests limited integration of official certification markers into market practices, which could reduce the competitive advantage of Erzurum civil cheese in domestic and international markets. Addressing this gap through mandatory GI labeling policies and promotional campaigns could enhance consumer trust, market recognition, and brand value.

Discussion and conclusion

Based on the study's findings, Erzurum civil cheese is produced following the registration certificate issued by the TPTO by following the stages mentioned in the separated milk from the oils of cows fed with aromatic herbs in the region. The lack of fat of other cheeses varies regarding shelf life and diet use. Previous study states that consumers prefer Erzurum civil cheese in their diet cheese choices [31].

The producers' hearing experience is present in the field of GI. However, it is also reflected in their responses to organizations that come for the audit, which need full knowledge. In addition, it has been established that although the Geographical Indications and Traditional Product Name Logo Regulations entered into force (Official newspaper, 2017) on December 29, 2017, the reserved logo is still not used on packaged sales or in stores making sales. Logo and label awareness among producers is low. Similar to the findings, studies of low awareness are available in the literature [21, 25, 27, 31]. However, a solution to this problem can be proposed, as in the case of the high

awareness studies [23, 24], to establish the Erzurum civil cheese manufacturers association.

This authentic product must be preserved before passing it on to future generations. According to the producers, apprentices or masters must be raised to perform cheese production flawlessly. In addition, Erzurum civil cheese should be publicized and advertised in national and international markets very well. This will raise the awareness of cheese and encourage intense winter tourism by developing gastronomy tourism in the region. This will help ensure the sustainability of the production of traditional products. The historical study findings support the producers' thinking [1, 5, 7, 24].

If gastronomy tourism is to be developed locally, specific problems such as low knowledge and awareness and label use in production and marketing must be eliminated first. Then, an association must be established for producers, and all producers must be included in the GI applications process. Producer associations play a very significant role in the success of E.U. Cheese producers are therefore optimistic about the future and want to take their products to international markets.

A geographical indication (GI) days can be organized in the region. On top of that, festivals specific to the production of Erzurum civil cheese should be organized to explain the production method, invitations for gastro-tourists to the region, and it may even be possible to establish an "Erzurum Civil cheese Museum" so that they can spread these practices to twelve months. This way, the cultural heritage can be preserved, and cheese can be passed on to future generations. Civil cheese should be integrated into tourism activities, and various events in this direction and sales points should create a strong synergy. In comparison, the TPTO is recommended to organize training programs to increase the awareness and awareness of GI producers.

The study focused solely on the Erzurum civil cheese found in the region. Other gastronomic products can be studied similarly, and resources with detailed explanations on the production of many products, particularly civil cheese, in the cookbooks and brochures.

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Author contributions

ED contributed to conceptualization, methodology, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and reediting, and supervision and provided software.

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Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with ethical principles involving human participants. Ethical approval was obtained from Atatürk University Ethics Commission (Approval No: E.88656144-000-2300100488, Date: 27.03.2023) during the first meeting. All participants were informed about the study's purpose, procedures, and their rights before participation. Written informed consent was obtained from all participants prior to data collection, ensuring voluntary participation and confidentiality. No human or animal specimens were used in this work. The environment is not damaged.

Consent for publication

All authors have read and agreed to the published version of the manuscript.

Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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