


CERTIFICATION OF BRAZILIAN ARTISANAL CHEESE: CHALLENGES AND PERSPECTIVES OF THE ARTE SEAL

CERTIFICAÇÃO DO QUEIJO ARTESANAL BRASILEIRO: DESAFIOS E PERSPECTIVAS DO SELO ARTE

CERTIFICACIÓN DEL QUESO ARTESANAL BRASILEÑO: DESAFÍOS Y PERSPECTIVAS DEL SELLO ARTE

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ABSTRACT

The central question of this study was to explore and understand the dynamics that permeate the certification of Brazilian artisanal cheese, focusing on the application of the Art Seal, evaluating the effects on producers and the consumer market based on the literature on the subject. Thus, the present study aimed to understand the approaches to the certification of Artisanal Cheese and Art Seal based on a systematic review of the literature. The methodology adopted for the present study can be classified as bibliographic and descriptive research, conducted through a systematic approach to literature. A research protocol was created for data collection, processing and analysis. Sources consulted include Periodicals Capes, Google Scholar and Scientific Electronic Library Online (SciELO). The research was carried out between May 23 and 24, 2024, where the selection of articles included searches with the key expressions: “artisan cheese” and “art seal”, totaling 23 scientific articles. The results showed that the B1 classification configured as the Qualis Capes classification of the journals for the majority of selected articles. The year 2023 represented the year with the most publications. Bibliographic and documentary research were the main methodologies adopted, secondly the use of experimental studies and then qualitative research, the latter two being approaches with primary data collection. The objects of study cover several regions of Brazil, with emphasis on Minas Gerais, Paraná and areas of the Northeast, whose investigation focused on certification of artisanal cheeses, analysis of good manufacturing practices and legislation. The analysis of documents and bibliographic sources made it possible to identify the main theoretical currents and the challenges faced by producers in obtaining certification. The analysis categories Geographical Indication (GI), Culture and Regionalism, Legislation and Regulation, and Good Manufacturing Practices and Food Safety were created, which presented a synthesis of the approaches of the selected articles. The study concludes that, although Art Seal promotes cultural recognition and the competitiveness of products in the market, it is essential to implement measures that simplify legal requirements and offer support to small producers in their formalization.

Keywords: Artisanal Cheese. Art Seal. Certification. Craft Production. Food Legislation.

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RESUMO

A questão central deste estudo foi explorar e compreender as dinâmicas que permeiam a certificação do queijo artesanal brasileiro, com foco na aplicação do Selo Arte, avaliando os efeitos para os produtores e para o mercado consumidor a partir da literatura sobre a temática. Desta forma, o presente estudo teve como objetivo conhecer as abordagens sobre a certificação do Queijo Artesanal e Selo Arte a partir da revisão sistemática da literatura. A metodologia adotada para o presente estudo pode ser classificada como pesquisa bibliográfica e descritiva, conduzida por meio de uma abordagem sistemática da literatura. Foi criado um protocolo de pesquisa para a coleta, tratamento e análise dos dados. As fontes consultadas incluem Periódicos Capes, Google Acadêmico e Scientific Electronic Library Online (SciELO). A pesquisa foi realizada entre os dias 23 e 24 de maio de 2024, na qual, a seleção dos artigos incluiu buscas com as expressões-chave: “queijo artesanal” e “selo arte”, totalizando 23 artigos científicos. Os resultados mostraram que a classificação B1 configurou como a classificação Qualis Capes dos periódicos da maioria dos artigos selecionados. O ano de 2023 representou o ano com a maioria das publicações. A pesquisa bibliográfica e documental foram as principais metodologias adotadas, em segundo lugar o uso de estudos experimentais e na sequência pesquisas qualitativas, pois estas duas últimas abordagens com coleta de dados primários. Os objetos de estudo abrangem diversas regiões do Brasil, com destaque para Minas Gerais, Paraná e áreas do Nordeste, cuja investigação focou em certificação de queijos artesanais, análise das boas práticas de fabricação e legislação. A análise de documentos e fontes bibliográficas possibilitou a identificação das principais correntes teóricas e dos desafios enfrentados pelos produtores na obtenção da certificação. Foram criadas as categorias de análise Indicação Geográfica (IG), Cultura e Regionalismo, Legislação e Regulamentação, e Boas Práticas de Fabricação e Segurança Alimentar, que apresentaram a síntese das abordagens dos artigos selecionados. O estudo conclui que, apesar do Selo Arte fomentar o reconhecimento cultural e a competitividade dos produtos no mercado, é imprescindível implementar medidas que simplifiquem as imposições legais e ofereçam suporte aos pequenos produtores em sua formalização.

Palavras-chave: Queijo Artesanal. Selo Arte. Certificação. Produção Artesanal. Legislação Alimentar.

RESUMEN

La cuestión central de este estudio fue explorar y comprender las dinámicas que rodean la certificación del queso artesanal brasileño, con énfasis en la aplicación del Sello Arte, evaluando sus efectos para los productores y para el mercado consumidor a partir de la literatura existente. De este modo, el presente estudio tuvo como objetivo examinar los enfoques sobre la certificación del Queso Artesanal y el Sello Arte mediante una revisión sistemática de la literatura. La metodología adoptada puede clasificarse como investigación bibliográfica y descriptiva, conducida a través de un enfoque sistemático de la literatura. Se elaboró un protocolo de investigación para la recopilación, el tratamiento y el análisis de los datos. Las fuentes consultadas incluyeron Periódicos CAPES, Google Académico y Scientific Electronic Library Online (SciELO). La búsqueda se realizó entre los días 23 y 24 de mayo de 2024, y la selección de los artículos incluyó búsquedas con las palabras clave “queso artesanal” y “sello arte”, totalizando 23 artículos científicos. Los resultados mostraron que la mayoría de los artículos seleccionados fueron publicados en revistas clasificadas como B1 en el sistema Qualis Capes. El año 2023 representó el período con mayor número de publicaciones. La investigación bibliográfica y documental fueron las metodologías predominantes, seguidas de estudios experimentales y de investigaciones cualitativas, ya que estas dos últimas implican la recolección de datos primarios. Los objetos de estudio

abarcaron diversas regiones de Brasil, con énfasis en Minas Gerais, Paraná y zonas del Nordeste, centrados en la certificación de quesos artesanales, el análisis de buenas prácticas de fabricación y la legislación. El análisis de documentos y de fuentes bibliográficas permitió identificar las principales corrientes teóricas y los desafíos enfrentados por los productores para obtener la certificación. Se crearon categorías de análisis—Indicación Geográfica (IG), Cultura y Regionalismo, Legislación y Reglamentación, y Buenas Prácticas de Fabricación y Seguridad Alimentaria—que sintetizaron los enfoques presentes en los artículos seleccionados. El estudio concluye que, aunque el Sello Arte fomenta el reconocimiento cultural y la competitividad de los productos artesanales en el mercado, es imprescindible implementar medidas que simplifiquen las exigencias legales y brinden apoyo a los pequeños productores en su proceso de formalización.

Palabras clave: Queso Artesanal. Sello Arte. Certificación. Producción Artesanal. Legislación Alimentaria.

1 INTRODUCTION

This work has as its central theme the certification of artisanal cheese. Recently, there has been an increase in the appreciation of artisanal products by consumers, motivated by the desire to consume foods that have a cultural identity, that are produced in a sustainable way and that have a superior quality (MARTINELLI; ANJOS, 2023; GEORGE; PINTO, 2023). In addition, certification is crucial to ensure the origin and food safety of these products, complying with market demands and the sanitary standards in force (SILVA *et al.*, 2022; PORTO *et al.*, 2022).

In addition, the rural producer can obtain gains from this process by adapting to the legislation, providing quality and authenticity to the products, gaining trust with consumers, enriching reputation and appreciation in the market.

The certification allows the expansion of product sales opportunities, reaching new market niches, including at an international level. As a result, there has been an increase in Brazilian exports of artisanal cheeses, reflecting the growing appreciation of the quality and reliability of this product in global markets (FERREIRA; COSTA, 2021; MATOS, 2023). This growth is driven by the demand for traditional gastronomic products and by consumers' search for unique culinary experiences, in addition to the appreciation of artisanal and sustainable production, showing that the quality standards required by regulatory agencies are being met (PENA *et al.*, 2022; MARTINELLI; ANJOS, 2023).

Artisanal cheeses have several ways to be used in cooking, which directly impacts their acceptance by the public. They can be enjoyed as part of a quick snack, in desserts or as an appetizer, it is quite common to combine cheeses with drinks such as wine, cachaça and beer. In addition, these artisanal cheeses can be incorporated into the preparation of savory and sweet dishes, as well as in the production of cheese bread, cakes and even as a filling for pasta, among other culinary options (MINISTRY OF AGRICULTURE, LIVESTOCK AND SUPPLY - MAPA, 2021).

The per capita consumption of milk and dairy products in Brazil increased by 5.1% in 2023, due to the growth in citizens' income and the drop in dairy prices. The supply of milk in the country grew 5.6% compared to the previous year, resulting in an increase of 1.409 million liters, of which 63% came from the increase in imports (EMBRAPA, 2024). In 2022, the per capita consumption of UHT milk in Brazil was 123.5 liters, which represents the lowest amount since 2013, showing a decrease compared to 2021, but still 52.7% higher than what was observed in 2004 (EMBRAPA, 2023).

According to the Confederation of Agriculture and Livestock of Brazil - CNA (2022), between 2017 and 2021, the value of Brazilian exports of dairy products grew by 50%. In the same period, world exports rose 11% and countries that have a more relevant share than Brazil, such as Switzerland and Uruguay, recorded a drop in sales, of 12% and 18% respectively. First place in the *ranking*, the European Union grew proportionally smaller than Brazil with 11%.

The Minas Gerais Institute of Agriculture - IMA (2019), with the creation of Decree No. 9,918, of 07/18/2019, which regulated Law No. 13,680, of 07/14/2018, establishes guidelines for granting the Art Seal by IMA, allowing handicraft products of animal origin to be marketed interstate, as long as they are subject to sanitary inspection. Cheese producers must be registered with the state inspection service, carried out by the IMA, and comply with the standards of good agricultural practices and good artisanal manufacturing practices. In addition to creating the Artisanal Cheese seal, the objective of the new decree is to clarify inspection powers, regulate the broad national commercialization of products and ensure the provision of adequate information to consumers, especially on the health and safety of food products of animal origin produced in an artisanal way (IMA, 2019).

There are several difficulties that producers face in the production and legalization of artisanal cheese for commercialization. Cheese producers must be registered with the state inspection service, carried out by the IMA, and comply with the standards of good agricultural practices and good artisanal manufacturing practices (IMA, 2019).

According to the Ministry of Agriculture, Livestock and Supply (MAPA, 2022), among the benefits of the regulation is the stimulus to formalize more producers in Brazil. A canastra cheese producer, for example, who already has the Art Seal may receive the Artisanal Cheese seal, that is, he can choose to use both or use only one. This is because it is a cheese linked to the territory, produced by a specific region. In the case of some seasoned cheeses, which can be produced independently of the region, they are eligible to receive the Art Seal, but cannot receive the Artisanal Cheese seal.

The Art Seal is a certificate that ensures that the food product of animal origin was made in an artisanal way, with a recipe and process that have its own, traditional, regional or cultural characteristics. It can be granted to dairy products, meat, fish and its derivatives and bee products. The Artisanal Cheese Seal, on the other hand, is a certificate that ensures that artisanal cheeses were made by traditional methods with territorial, regional or cultural

attachment and appreciation (MINISTRY OF AGRICULTURE, LIVESTOCK AND SUPPLY - MAPA, 2022).

Certifications ensure that products have unique, differentiated organoleptic properties inherent to the "artisanal making" of a particular region, tradition or culture. The two seals lead to the addition of value to products of animal origin and allow free commercialization in the national territory. With the new Decree and the inclusion of Mapa as the granting body of the Seals, the possibility of recognizing Brazilian artisanal products in other countries is envisaged, reaffirming the quality and value of these products, already recognized in international competitions (FEDERAÇÃO DA AGRICULTURA E PECUÁRIA DO ESTADO DE SÃO PAULO - FAESP, 2022).

On December 4, 2024, the United Nations Educational, Scientific and Cultural Organization (UNESCO) officially gave the title of Intangible Cultural Heritage of Humanity to the "Ways of Making Artisanal Minas Cheese". This honor underlines the significant historical and cultural importance of artisanal cheese production in Minas Gerais, highlighting the transmission of knowledge over generations and the relevance of the product to the local identity and economy. This international recognition provides Artisanal Minas Cheese with greater visibility in the world, creating new opportunities for its appreciation and promoting gastronomic tourism in the region. In addition, this validation encourages the preservation of traditional practices and fosters the creation of public policies aimed at the protection and sustainability of artisanal production (UNESCO, 2024).

The panorama of artisanal cheese certification in Brazil, especially with regard to the Art Seal, proves to be an aspect of great importance, both for the recognition of producers and for ensuring the quality and authenticity of the product. However, the certification process faces challenges and particularities, ranging from compliance with legal standards to the preservation of the traditional and regional characteristics of the cheese. Thus, the central issue of this study was to explore and understand the dynamics that permeate the certification of Brazilian artisanal cheese, focusing on the application of the Art Seal, evaluating the effects for producers and the consumer market from the literature on the subject.

This work is relevant due to the need for a more in-depth evaluation of the panorama of artisanal cheese certification in Brazil, specifically through the Art Seal. Certification has been the subject of considerable discussion, being seen as crucial for the appreciation and sale of handicraft products, in addition to promoting their entry into broader markets (SILVA *et al.*, 2022; MARTINELLI; ANJOS, 2023). Recent studies have explored the obstacles that

producers face in obtaining these certifications, emphasizing the sanitary requirements and bureaucracy that surround them (FERREIRA; COSTA, 2021; ROCK; CALDAS, 2023).

In this way, this research is integrated with these analyses by deepening the reflection on the norms of the Art Seal and its consequences for the commercialization of artisanal cheese in Brazil. In addition to enriching the academic debate, the findings of this research can be of great help to producers and those responsible for formulating public policies, offering information to improve and increase access to the seal, ensuring its role in cultural preservation and economic growth.

Finally, by examining the certification process of artisanal cheese, this study seeks to reinforce the identity and competitiveness of Brazilian cheese in the market, favoring the sustainability of small rural properties and the preservation of cheesemaking traditions in the country. Thus, this work has as its general objective to know the approaches to the certification of Artisanal Cheese and Art Seal from the systematic review of the literature. Specifically, the study aimed to characterize the articles selected for the study in relation to the Qualis Capes classification of the journals, the years of publication, methodologies adopted and objects of study investigated; to ascertain the approach present in the theoretical foundations of the articles participating in this study and; to create categories of analysis from the content of the selected articles on artisanal cheese and to present the synthesis of the approaches of the articles under study.

2 THEORETICAL FOUNDATION

In the Brazilian context, artisanal cheeses have their origins in the Portuguese influence, which brought to Brazil the production of cheeses with raw milk (BORELLI³ *et al.*, 2016 *apud* ARAÚJO *et al.*, 2020; CAMPELLO *et al.*, 2021). This practice was incorporated into the Brazilian territory and was consolidated in several regions, with Minas Gerais standing out as an important center for the production of artisanal cheese.

In Minas Gerais, cheese is not just a food, but a cultural and economic symbol. The cheese tradition began with the arrival of cattle during the colonial period, as a solution to food shortages, and quickly became integrated into the local diet and the region's economy (TAVARES, 2022).

³ BORELLI, B.M.; LACERDA, I.C.A.; PENIDO, F.C.L.; ROSA A.C. Traditional Cheeses Produced in Brazil: Characterisation, Production Technologies and Health Implications. *In*: PERKINS, E. (Ed.). **Food microbiology fundamentals, challenges and health implications**. New York: Nova Science Publishers, Inc., 2016. chap.7, p.161-189.

Today, dairy farming is consolidated as a vital activity for the State, influencing both economic and cultural aspects. The milk produced in Minas Gerais is essential not only for direct consumption, but also for the production of various derivatives, such as cheese, yogurt, and cottage cheese (MATOS, 2023).

The state of Minas Gerais is recognized as one of the most important centers for the elaboration of artisanal cheeses in Brazil, with several areas that have historically been dedicated to the production of these items, which combine ancient knowledge and methods passed down from generation to generation. The most relevant regions in the manufacture of Minas Artisanal Cheese (QMA) are Araxá, Campos das Vertentes, Cerrado, Serra da Canastra, Serra do Salitre, Serro, Triângulo Mineiro, Serras da Ibitipoca, Diamantina and Entre Serras da Piedade ao Caraça, all of which are notable for their specific production characteristics and the unique sensory qualities of the cheeses produced in these locations (COSTA *et al.*, 2022).

2.1 LEGISLATION AND CERTIFICATION STANDARDS

The production of Artisanal Cheese was directly impacted due to government actions, including the creation of laws and the implementation of public policies. This scenario intensified from the 2000s onwards, with the revision of the criteria for sanitary standards for products of animal origin in the country. The new regulations stipulated that Artisanal Minas Cheese (QMA) could only be marketed if it followed standards similar to those of industrial production (GIÁCOMO, 2022).

In 2000, French technicians visited Minas Gerais to improve the quality and income of the producers of Minas Artisanal Cheese (QMA) through international cooperation. They observed production in the regions of Serra da Canastra, Serra do Salitre and Serro, identifying the need to improve food safety and sanitary issues. Although the QMA had a market, there were concerns about the pasteurization of raw milk, which could alter its characteristics, in addition to problems such as lack of sanitary control and falsification regarding the geographical origin of the cheese (TAVARES, 2022).

Law No. 13,860, of July 14, 2018, defines artisanal cheese in its Article 1 as that produced by traditional methods, which values and is linked to a certain territorial, regional or cultural area. This type of cheese must follow a specific elaboration protocol for each type and variety, and must be manufactured with good agricultural and production practices (BRASIL, 2018).

According to Monteiro and Matta (2018), artisanal cheeses need to be processed in the rural establishments where the milk is produced. The maturation of the cheese must take place in a room with adequate humidity and temperature control, as well as enough space for the storage of the pieces.

Given the economic and cultural relevance of artisanal cheeses, producers sought to formalize production to meet legal requirements and preserve traditional characteristics. In response, the Art Seal was instituted by Law 13.680/2018, regulated by Decree 9918/2019. This decree allows states and the Federal District, with approved regulations, to grant the registration of handicraft products in accordance with federal legislation, promoting regional development, the expansion of local businesses and combating the illegal market (CAMPELLO *et al.*, 2021).

2.1.1 The Art Seal

The Art Seal, established by Law 13,680/2018 and regulated by Decree 9,918/2019, aims to ensure the genuineness and excellence of artisanal foods, enabling their sale throughout the Brazilian territory. This certification validates traditional production techniques and ensures that the products comply with sanitary standards, fostering the cultural and economic appreciation of local producers (BRASIL, 2018; BRAZIL, 2019).

The certification strengthens the identity of artisanal products and enables greater competitiveness in the formal market, in addition to allowing states and the Federal District to grant the seal according to local regulations, promoting the decentralization of the process and the autonomy of producers in the commercialization of their products (CAMPELLO *et al.*, 2021).

Certified products must comply with specific requirements, such as the use of their own raw material or of known origin, and the implementation of mostly manual processes. This certification not only guarantees the credibility of the product, but also allows its sale without limitations linked to the region of production or the type of sanitary inspection in force (MAPA, 2020).

The Art Seal plays a crucial role in the formalization of producers and the appreciation of artisanal products at the national level, enabling their growth in the consumer market and encouraging the maintenance of regional culinary traditions (MAPA, 2020).

The Art Seal plays a fundamental role in validating the quality of artisanal products, facilitating the adequacy of inspection processes for food of animal origin produced in an

artisanal way. These products, which are mostly made with their own or specific raw material, have their quality guaranteed by inspection agencies. This provides greater food confidence and security, while preserving the culinary and cultural traditions of each region. In addition, the Art Seal increases access to authentic and unique products, promoting the appreciation of local practices, income generation and the strengthening of traditional communities in Brazil (SEBRAE, 2020).

In order to be considered artisanal, within the scope of the Art Seal, food products must meet seven requirements:

- I - Raw materials of animal origin must be processed on the property where the processing unit is located or must have a determined origin;
- II - The techniques and utensils adopted that influence or determine the quality and nature of the final product must be predominantly manual at any stage of the production process;
- III - The production process must adopt good practices in the manufacture of artisanal products with the purpose of ensuring the production of safe food for the consumer;
- IV - The raw material production units and the units of determined origin must adopt good agricultural practices in artisanal production;
- V - The final product of manufacture must be individualized, genuine and maintain the uniqueness and traditional, cultural or regional characteristics of the product, allowing sensory variability between batches;
- VI - The use of industrialized ingredients must be restricted to the minimum necessary, and the use of dyes, flavorings and other additives considered cosmetic is prohibited; and
- VII - Processing should be done primarily from a traditional recipe, which involves techniques and domain knowledge of the manipulators (GOV, BR, 2021).

The eligible establishment must contact the state inspection body to request the Art Seal (EMBRAPA, 2021).

2.2 LABELING

According to the National Health Surveillance Agency (ANVISA, 2005), the relevance of nutritional labeling of food products to encourage a healthy diet and ensure strategies to prevent chronic diseases is highlighted in several studies and research in the area of nutrition. The inclusion of nutritional information on the labels of packaged foods has been mandatory

in Brazil since 2001. In order to create a single regulation for MERCOSUR countries, there was a need to review Brazilian standards and adapt them to global trends. In October 2020, ANVISA approved new nutritional labeling standards, whose implementation began in October 2022 (ANVISA, 2025).

According to Machado (2018), IMA Ordinance No. 1,261 of 11/09/12, Artisanal Minas Cheese, in registered cheese dairies, must include the information indicated in Table 1 on the labeling.

Table 1

Labeling identifications

Identification of the cheese factory or warehouse: (IMA Ordinance no.1.261/12). Corporate name or name of the producer. Complete address of the establishment with the inclusion of the telephone number and zip code. Classification of the establishment: CHEESE FACTORY or DAIRY WAREHOUSE (State Decree No. 38,691/97). The expression REGISTRATION IN IMA/GIP UNDER No., (IMA Ordinance no. 1.261/12). CNPJ and STATE REGISTRATION, in the case of legal entities. CPF and IEPR, in the case of an individual and establishment located on rural property. The expression BRAZILIAN INDUSTRY in capital letters
Product sales denomination: ARTISANAL MINAS CHEESE in bold upper case, with at least 1/3 of the dimensions of the largest inscription on the label, affixed to the main panel. (MAPA Normative Instruction No. 22/05).
Commercial brand of the product, if any, affixed to the main panel.
Microregion of origin in uppercase. MICROREGION:.....
The phrase: PRODUCT MADE WITH RAW MILK, in upper case and bold, bets on the main panel.
Ingredients: Raw milk, salt, drip and rennet (in that order)
DATE OF MANUFACTURE/BATCH: (MAPA Normative Instruction No. 22/05), in capital letters.
VALIDITY:..... (MAPA Normative Instruction No. 22/05).
The phrases: MUST BE WEIGHED IN THE PRESENCE OF THE CONSUMER and WEIGHT OF THE PACKAGE: g, in integers and in grams (Inmetro Ordinance No. 25/86). Both sentences must be declared in the same font size and in capital letters
The expression KEEP COLD FROM 1 TO 10°C, in capital letters. (When recommended by the warehouse or cheese dairy).
ONCE OPENED, CONSUME WITHIN X DAYS (maximum time that the warehouse or cheese shop guarantees the quality of the product).
The phrase DOES NOT CONTAIN GLUTEN (Federal Law No. 10.674/03), in capital letters and in bold.
Official imprint of the IMA, (IMA Ordinance No. 1,261/12).
SISBI logo (Normative Instruction Map No. 2/09) inserted below the IMA stamp.
Nutritional Information Table. (ANVISA RDC Resolutions no. 359/03 and no. 360/03). Use Vertical Model A of Annex B of Resolution RDC No. 360/03. The layout must be obeyed as to the number of rows and columns.
"ALLERGIC: CONTAINS MILK" (ANVISA RDC Resolution No. 26/15)
CONTAINS LACTOSE (Decree - Law 13.305/16) and RDC no. 136/2017

Source: MACHADO, 2018.

In 2018, new laws were approved that brought changes to the labeling standards applied to artisanal cheeses in Minas Gerais. At the national level, according to Law No. 13,680, of June 14, 2018 (known as the Art Seal Law), artisanal cheeses must be marked throughout the Brazilian territory with a single seal indicating ARTE, as established in the specific regulation. In relation to the state of Minas Gerais, Law No. 23,157, of December 18, 2018, establishes that the labels of Minas Artisanal Cheeses must contain, at least, information such as the description of the type or variety, registration number, registration or title of the producing establishment, and municipality of origin.

The creation of the brand is essential, ensuring the proper positioning of all components of the ARTE Seal on the label. This ensures a cohesive and standardized presentation across the entire product line. This zeal not only enriches the identity of the artisanal product, but also favors the recognition and trust of consumers (MINAS GERAIS, 2018).

The elaboration of the brand is crucial, ensuring the correct placement of all elements of the Art Seal on the label. This ensures a unified and uniform presentation across the entire product range. This care not only enhances the identity of the handmade product, but also promotes customer recognition and trust, as shown in Figure 1 – Art Seal Grid (Minas Gerais, 2018).

Figure 1

Art Stamp Grid



Source: MAPA, 2020.

In addition, Minas Gerais legislation also allows the commercialization of cheeses without packaging, as long as identification methods such as bas-relief printing, stamps with non-toxic inks are used, or other forms authorized by current regulations (MINAS GERAIS, 2018).

The Art Seal mark obeys a set of specific guidelines, ensuring its proper application in certified products. The standardization of these components facilitates the identification of the seal by customers and ensures its authenticity.

In Table 2, the main elements of the Art Seal are highlighted. The seal structure is arranged in a grid of 6x6 squares inclined at 45°, which act as a foundation for the placement of the other components. The title "Handicrafts of Brazil" is printed in the four central squares of the upper ends of the stamp, with a Montserrat Regular font, with no changes in size between the words. The stamp's graphics, composed of stylized letters, must be centered, ensuring that it touches, but does not invade the squares that make up the text (MAPA, 2020).

Table 2

Elements of the Art Seal

3.2.1 The Grid	3.2.2 Text "Artesanal do Brasil"	3.2.3 The "Art" Graphics
The elements of the ARTE Seal will be arranged in a grid of 6x6 squares, inclined at 45°.	The text "Artesanal do Brasil" will be arranged in the four central squares of the upper sides, occupying its entire width the text must be written in the Montserrat Regular font, with no variations in its size between the excerpts "Artesanal" and "do Brasil". So that both parts completely occupy the width of four squares, the space between letters varies between the passages.	The graphics (stylized letters) that give the name to the ARTE Seal should be as centered as possible on the grid, with due attention to always touching, but never invading, the squares of the text present.

Source: MAPA, 2020.

As presented in Table 2 - Elements of the Art Seal, these guidelines ensure a uniform use of the seal in handicraft products, encouraging its appreciation and reliability in the consumer market (MAPA, 2020).

2.3 ECONOMIC AND SOCIAL IMPACT OF CERTIFICATION

The challenges faced by artisanal cheese producers are significant and reflect the complexities of current legislation. According to a study carried out by Matos (2023), respondents from Geographical Indications (GIs) reported several difficulties related to sanitary requirements, especially considering the particularities of artisanal cheese, such as the use of raw milk and the time required for maturation.

Maintaining traditional manufacturing methods is key to preserving the unique characteristics of the products, but Brazilian legislation is predominantly focused on industrial cheeses, which creates a challenge for artisanal producers. The comparison between industrial and artisanal production practices reveals a significant discrepancy in production patterns, making the legislation inadequate for the specific needs of artisanal cheeses (MATOS, 2023). In addition, the current legislation prevents the export of artisanal cheeses, allowing these products to obtain only the Art Seal, which is not sufficient for export (MATOS, 2023).

Traceability and certification of the origin of artisanal cheeses are essential to ensure the veracity of products and to combat counterfeiting. In Brazil, one of the methods used for this control is the implementation of casein labels, especially for the manufacture of cheeses with Geographical Indication (GI). APROCAN (Association of Canastra Cheese Producers) began to use these labels as a direct identification badge on the product. This system was implemented after an exchange of experiences with French producers, and was later approved by ANVISA and the Ministry of Agriculture, Livestock and Supply between 2015 and 2016. Casein brands ensure that only cheeses made in accordance with the guidelines defined by the Canastra GI obtain this certification, reducing unfair competition and promoting the strengthening of the market for authentic artisanal cheeses.

In addition, the traceability that this method offers allows for more effective control over the quantity of production of the members, ensuring adherence to regulatory requirements (MUÝLDER *et al.*, 2022). Matos (2023) points out that, due to the difficulties imposed by sanitary requirements, many producers sought to form associations and register their productions with a geographical indication to highlight the quality and differentials of the products. However, these associations face high costs and challenges related to legislation that regulates the production of artisanal cheeses and prevents export. The reality of many small producers, who have difficulties in making large investments, further complicates the situation.

In a study conducted by Silva *et al.* (2022), the analysis of the results indicates that most small producers are unable to comply with legal standards due to the high costs involved. There is an urgent need to adapt legislation to facilitate the entry of small enterprises into the formal market and to implement a training plan that ensures greater product safety.

3 METHODOLOGY

This study, from the methodological perspective, can be defined as a bibliographic research carried out through a systematic approach to the literature. According to Lakatos and Marconi (2003), scientific investigation is a formal and meticulous procedure that seeks the acquisition of knowledge, based on logical and systematic principles. Thus, more than simply collecting data, research seeks to establish a path to understand reality and discover solutions to specific issues, employing appropriate scientific methods. The implementation of this rigorous method ensures the reliability and validity of the analyses conducted during the research.

For the construction of the present study and formulation of results, a systematic review of the literature was carried out. According to the authors Galvão and Ricarte (2020), conducting a systematic review of the literature goes beyond the common procedure of conducting a review as part of an academic research.

Systematic review is a research method that adopts specific protocols and seeks to organize a vast set of documents in a logical way. After defining the concept and presenting the different types of systematic review, the stages of this process are discussed, which include the definition of the research problem, the choice of databases, the formulation of the search strategy, the selection of documents and the organization of the results. Finally, aspects related to the dissemination and publication of systematic literature reviews are addressed. Understanding these aspects is essential not only for researchers who carry out this type of investigation, but also for reviewers and editors of academic journals from different fields of knowledge.

This study is also structured as a descriptive study, as outlined by Prodanov and Freitas (2013), when the researcher limits himself to recording and describing the phenomena he observes, without intervening in them, seeks to detail the characteristics of a specific population or phenomenon, in addition to establishing links between different variables. This process uses standardized data collection techniques, such as questionnaires and systematic observation, usually taking the form of a survey.

3.1 DATA COLLECTION, PROCESSING AND ANALYSIS

Information was obtained through a literature review in several academic databases. The sources consulted include Capes Journals, Google Scholar and *Scientific Electronic Library Online* (SciELO). The research was carried out between May 23 and 24, 2024,

through a simple search, using the key expressions: "artisanal cheese" and "art seal", from which 215 documents were found, namely: scientific articles, dissertation, electronic books, monographs, report, abstracts, academic journal, doctoral thesis, course completion works (TCC). In addition, relevant legislation on the subject was analyzed on the official platforms of the Brazilian Institute of Geography and Statistics (IBGE), the Minas Gerais Institute of Agriculture (IMA) and the Ministry of Agriculture, Livestock and Supply (MAPA).

For the treatment of the collected data and the appropriate organization by platform, a spreadsheet was created in which each tab created referred to the platforms chosen for the study. And in each tab there were the following columns: number, type of work, title, citation, type of work, year, journal/journal, abstract of the article, topics of the theoretical framework, category of analysis to be created from the keywords of the article, conclusion obtained and the *link* to access the work. Articles published in English and Portuguese that are related to the theme were selected. However, all the articles found were in Portuguese.

Thus, the research protocol created aimed to select the works participating in this research and established the parameters for inclusion and exclusion of these articles. The parameters for the protocol have been detailed below:

- Parameter for inclusion of the works resulting from the protocol: carried out from the detailed reading of the abstract of each document, containing the key expressions, *artisanal cheese* and *Art Seal*.
- Exclusion of articles that did not contain the theme *artisanal cheese* and *Art Seal*.
- Any works that are not articles from journals/magazines (TCC, dissertation, thesis, specialization monograph, abstracts, event articles and books may be excluded).
- Deletion of repeated articles on the same platform and on different platforms.
- Deletion of articles that are not complete or that do not open or the page is no longer available.

The research protocol is summarized in Table 3, which details how the investigation was conducted and the systematic review carried out.

Table 3

Research protocol

Platform	SciELO	Google Scholar	Capes Journals
Date	23/05/2024	24/05/2024	23/05/2024

Search term	"Artisanal cheese" and "Art seal"	"Artisanal cheese" and "Art seal"	"Artisanal cheese" and "Art seal"
Language	Portuguese	Portuguese	Portuguese
Specific period	No time frame to know the time history of publications	No time frame to know the time history of publications	No time frame to know the time history of publications
Overall search result on the platforms based on the search terms	0	159	3
Articles chosen after refinement with the application of the search protocol with inclusion and exclusion parameter	0	23	0

Source: Prepared by the authors, 2024.

The search carried out in the SciELO data platform resulted in no article that met the parameters established for the study. As for the articles excluded based on the exclusion criteria, it was found that none focused only on the theme of artisanal cheese or the Art Seal, without addressing both simultaneously. All articles were in the stipulated languages (Portuguese and English), and there were no duplicate articles on the same platform or between the different search platforms. In addition, no article was excluded because it was incomplete, that is, containing only the abstract, and no article was discarded due to inoperative links or inaccessible content.

The search on the Google Scholar data platform resulted in 115 articles. Of these, 44 articles were selected because they met the parameters determined for the study. Of the excluded articles, 21 addressed only artisanal cheese or the Art Seal, but not both topics simultaneously. There were no articles outside the established languages (Portuguese and English). Two duplications were identified on the same platform and 53 articles could not be accessed due to inoperative links or unavailable content.

The search carried out in the CAPES Periodicals data platform resulted in three articles, which did not comply with the parameters established for the study, and there were no selected articles. Of the excluded articles, none addressed exclusively artisanal cheese or the Art Seal simultaneously. All articles were in the established languages (Portuguese and English) and there were no duplications on the same platform or among other search platforms. In addition, no article was excluded because it was incomplete, that is, containing only the abstract, and there were no inaccessible articles due to *inoperative* links.

Thus, a total of 23 scientific articles were selected after refinement and application of the research protocol, based on the inclusion and exclusion criteria. None of the articles came from SciELO or the CAPES Journals platform, and all 23 came from the Google Scholar platform. The selected articles were analyzed together and summarized in Table 4.

Table 4

Articles selected from the applied research protocol

No.	Quote	Title
01	Araújo <i>et al.</i> (2020)	A historical-critical analysis of the development of Brazilian standards related to artisanal cheeses
02	Campello <i>et al.</i> (2021)	The ways to obtain the Art Seal in Rio de Janeiro
03	Azenha e Silva (2021)	Contamination by <i>L. Monocytogene</i> in cheese
04	Silva e Melo (2020)	Macururé cheese made from men's alligator, AL: physicochemical, microbiological and production characteristics
05	Martinelli and Angels (2023)	Valorization of Brazilian artisanal cheeses: Applicability of three distinctive quality signs for curd cheese from the perspective of experts
06	Cislaghi and Badaró (2021)	Dilemmas of the production of artisanal colonial cheese in the southwest of Paraná
07	Porto <i>et al.</i> (2022)	Microbiological quality of curd cheese produced in salt pans, MG: a case study
08	Silva <i>et al.</i> (2022)	Good practices in the production of artisanal cheeses: a systematic review of the literature
09	Ströher <i>et al.</i> (2024)	Evaluation of good agricultural practices (GAP) and manufacturing practices (GMP) of an artisanal serrano cheese (QAS) agroindustry in Rio Grande do Sul (RS)
10	Faria and Aveni (2023)	The institute of geographical indication in Brazilian law and the tolerance of the word "type" on the label
11	Ferreira e Costa (2021)	The protection of the cultural heritage of Minas Gerais by regulating the production and commercialization of artisanal cheeses
12	Goulart and Pinto (2023)	Brazilian artisanal and authorial cheeses: what is said about these products in the media and in the scientific community?
13	Rocha and Caldas (2023)	A study of the cottage cheese of Santa Bárbara-BA for the recognition of Geographical Indication (GI)
14	Benincá <i>et al.</i> (2020)	Raw milk cheese: case studies with agro-industries and health surveillance in the Department of Sarthe, France

15	Cruz <i>et al.</i> (2020)	Social networks and preservation of artisanal cheese production methods on Marajó Island, PA
16	Braccini <i>et al.</i> (2022)	Legality versus informality in the commercialization of colonial cheeses in southern Brazil: the consumer at the center of the debate
17	Souza and Borges (2023)	The regional culture in the production of cabacinha cheese: a study based on subjects from Goiás and Mato Grosso
18	Ströher, Silva and Nunes (2023)	Microbiological quality of colonial artisanal cheese (QAC): impact of good manufacturing practices - a systematic review
19	Silva <i>et al.</i> (2022)	Obstacles and challenges for the implementation of a geographical indication: the case of the curd cheese of Jaguaribe-CE
20	Ragazzon and Marconato (2023)	The Socioeconomic Impact of SUSAF-PR on Cheese Dairies in the Southwest Region of Paraná
21	Silva and Borelli (2020)	The importance of lactic acid bacteria in the safety and quality of artisanal Minas cheeses
22	Costa <i>et al.</i> (2022)	Artisanal Minas cheeses – a brief review
23	Pena <i>et al.</i> (2022)	Gastronomic know-how in Brazil: intangible heritage and Geographical Indication as resources for its protection

Source: Prepared by the authors, 2024.

The analysis of the collected data involved a critical and comparative reading of the identified legislation and standards, as well as the evaluation of the challenges and legal requirements that artisanal cheese producers face. The main points of compliance and the bureaucratic obstacles that impact the legalization and certification of artisanal products were identified. The analysis also included the verification of the differences between state and federal regulations, with a particular focus on the specificities of the state of Minas Gerais.

The 23 articles selected for content analysis were read in depth and completely. According to Bardin (1977), this process aims to structure in an appropriate way and present information in a different way, using transformation processes. The objective is to store information in a varied way and facilitate access to the observer, allowing him to extract the maximum amount of data (quantitative aspect) and relevance (qualitative aspect).

The content analysis allowed thematic categorization of the articles, divided into three large groups, based on their contents and the keywords of each article: 1) Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses; 2) Legislation and Regulation and; 3) Physicochemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety. This classification was crucial to organize the analysis and understand the main areas of interest addressed in the articles.

The distribution of articles by groups addressed a view of the most recurrent approaches in the literature. The next section presents the results of the systematic review carried out.

4 RESULTS AND DISCUSSION

This section addressed the results of the studies presented in this research. Initially, it discussed the general characterization of the articles selected for the study in relation to the years of publication, the Qualis Capes classification of the journals, the methodologies adopted and the objects of study investigated. Next, he presented the theoretical foundations and the main works used in the selected articles of this study. And, finally, he explained about the categories of analysis created from the content of the selected articles on artisanal cheese, synthesizing the approaches of the articles under study.

4.1 GENERAL CHARACTERIZATION OF THE ARTICLES

In this section, the characterization of the 23 articles selected for analysis was presented. The approach showed the Qualis classification of these articles, the years of publication, the methodologies used in the studies and the objects of investigation analyzed. The objective was to provide a broad and detailed view of the characteristics of the selected articles. Table 5 presents the Qualis Capes classification of the journals whose selected articles were published.

Table 5

Qualis Capes classification of journals

No.	Title	Journal/Magazine	Qualis Capes Classification
1	A historical-critical analysis of the development of Brazilian standards related to artisanal cheeses	Periodicals Brazilian Archives of Veterinary Medicine and Animal Science (Arq. Bras. Med. Vet. Zootec.)	B1
2	The paths to obtain the Art Seal in Rio de Janeiro	Food Magazine: Science, Technology and Environment	C
3	L. Monocytogenes <i>contamination</i> in cheese	Brazilian Journal of Animal and Environmental Research	B4
4	Macuriré cheese manufactured in Jacaré dos Homens, AL: physicochemical,	Cândido Tostes Dairy Institute Magazine	C

	microbiological and production characteristics		
5	Valorization of Brazilian artisanal cheeses: applicability of three distinctive quality signs for curd cheese from the perspective of experts	Memória em Rede Magazine	B1
6	Dilemmas of the production of artisanal colonial cheese in the southwest of Paraná	Faz Ciência Magazine	B2
7	Microbiological quality of curd cheese produced in Salinas, MG: a Case Study	Cândido Tostes Dairy Institute Magazine	C
8	Good practices in the production of artisanal cheeses: a systematic review of the literature	Revista Diversitas Journal	B2
9	Evaluation of good agricultural practices (GAP) and manufacturing practices (GMP) of an artisanal serrano cheese (QAS) agroindustry in Rio Grande do Sul (RS)	Agricultural Science Magazine	C
10	The institute of geographical indication in Brazilian law and the tolerance of the word "type" on the label	JRG Journal of Academic Studies	C
11	The protection of the cultural heritage of Minas Gerais by regulating the production and commercialization of artisanal cheeses	Prisma Legal Magazine	A4
12	Brazilian artisanal and authorial cheeses: what is said about these products in the media and in the scientific community?	Concilium Magazine	A4
13	A study of the cottage cheese of Santa Bárbara-BA for the recognition of Geographical Indication (GI)	Journal of Management and Secretariat	B1
14	Raw milk cheese: case studies with agro-industries and health surveillance in the Department of Sarthe, France	Cândido Tostes Dairy Institute Magazine	C
15	Social networks and preservation of artisanal cheese production methods on Marajó Island, PA	Redes Magazine (Santa Cruz do Sul, Online)	A3

16	Legality versus informality in the commercialization of colonial cheeses in southern Brazil: the consumer at the center of the debate	Journal of Social Studies	B4
17	The regional culture in the production of cabacinha cheese: a study based on subjects from Goiás and Mato Grosso	Building the Way Magazine	B4
18	Microbiological quality of colonial artisanal cheese (QAC): impact of good manufacturing practices - a systematic review	Journal of Nutrition and Health Surveillance	C
19	Obstacles and challenges for the implementation of a geographical indication: the case of the curd cheese of Jaguaribe-CE	Economic Journal of the Northeast	A4
20	The Socioeconomic Impact of SUSAF-PR on Cheese Dairies in the Southwest Region of Paraná	Paranaense Development Journal	B1
21	The importance of lactic acid bacteria in the safety and quality of artisanal Minas cheeses	Journal of the Cândido Tostes Dairy Institute	C
22	Artisanal Minas cheeses – a brief review	Research, Society and Development Journal	A3
23	Gastronomic know-how in Brazil: intangible heritage and Geographical Indication as resources for its protection	Cultural Confluences Magazine	A4

Source: Prepared by the authors, 2024.

The analysis of Table 5 revealed that there are no articles (0%) classified in categories A1 and A2, which pointed to the inexistence of journals with greater academic repercussion among the selected articles. It is observed that 8.7% of the articles are in category A3 and 17.4% in A4, resulting in a total of 26.1% of publications in journals with significant academic impact. In group B, 17.4% are classified as B1, 8.7% as B2 and 13% as B4, adding up to 39.1% in intermediate-level journals. Finally, 34.8% of the articles belong to classification C, evidencing a higher frequency of publications in journals with less academic impact.

Regarding the years of publication, it can be observed that the articles analyzed are distributed in a varied way over time. In 2020, five articles were identified, while in 2021, there was a slight decline to four. In 2022, there was an increase, with six articles published. In

2023, the highest number was recorded, totaling seven articles. Finally, in 2024, only one study was found. This distribution shows a growing trend of interest in the topic until 2023, with a slight reduction in the last year analyzed, as shown in Table 6, below.

Table 6

Year of publication of the selected articles

Year	Absolute value	Relative Value (%)
2020	5	21,74
2021	4	17,39
2022	6	26,09
2023	7	30,43
2024	1	4,35
Total	23	100,00

Source: Prepared by the authors, 2024.

It should be noted that the research protocol was carried out without a time frame to know the time history of the publications. What can be verified in relation to this point is that the first published articles date from 2020, converging with the moment when the subject begins to be discussed in academia. The Art Stamp Law was enacted in 2018 (Law 13.680/2018 and regulated by Decree 9918/2019). It should also be added that the Minas Gerais Institute of Agriculture - IMA (2019) regulated this law with the creation of Decree No. 9,918, of 07/18/2019, which established guidelines for granting the Art Seal by the IMA, allowing handicraft products of animal origin to be marketed interstate, as long as they are subject to sanitary inspection.

In addition, the association of the subject of artisanal cheese certification related to the Art Seal took place two years after the publication of Law No. 13,860, of July 14, 2018, which defined in its first article artisanal cheese as that produced by traditional methods, which values and is linked to a certain territorial area, regional or cultural.

The methodology or material and methods of a study describes the process of development of the research, including the typology of the investigation carried out and details about the collection, analysis and treatment of the data obtained. Next, in Table 7, the methodological approach of the selected articles was presented, which deal with the certification of artisanal cheese and the art seal.

Table 7

Methodologies adopted

No.	Quote	Methodology	Data collection
01	Araújo <i>et al.</i> (2020)	Bibliographic research with critical analysis considering: 1) the main types of artisanal cheeses produced in Brazil and their characteristics, 2) a historical presentation of the standards related to the production and commercialization of Brazilian artisanal cheeses and 3) critical discussion about the challenges and perspectives for the development of new standards and their potential impacts on identity, quality and harmlessness of these products.	Primary sources: official legislation; Secondary sources: reviews of scientific literature and databases.
02	Campello <i>et al.</i> (2021)	Qualitative approach with a bibliographic and documentary review to examine the legislation that regulates the production of artisanal cheese in Brazil.	Documents and scientific literature.
03	Azenha e Silva (2021)	The Federal Official Gazette was used as the main reference, the search tool "Google Scholar" with the keywords "Listeriosis", "Cheese" and "Listeria", and books such as " <i>Modern Food Microbiology</i> " and " <i>The Microbiology of Safe Food</i> " for the development of the work.	Secondary sources: books, scientific articles, and government data.
04	Silva e Melo (2020)	Experimental research. Four technical visits were carried out between August and November 2018, where all manufacturing stages were monitored and described in detail through direct observation, audiovisual records and dialogue with the producer throughout manufacturing. The acidity (% lactic acid) of the dough was also monitored from its obtaining to the final shaping process (by direct titration with NaOH 0.1 mol/L). Another parameter monitored throughout the process was the temperature of scalding/washing and cooking the dough. Physicochemical, microbiological and cheese production analyses.	Primary sources: interviews with producers and laboratory data; Secondary sources: revision of legislation.
05	Martinelli and Angels (2023)	This is a qualitative study, with data collection through semi-structured interviews with specialists. Case study, with content analysis.	Primary sources: qualitative interviews; Secondary sources:

			review of academic literature and institutional data.
06	Cislaghi and Badaró (2021)	Qualitative research. Case study. This article reports the main actions already carried out by some projects developed on artisanal Colonial cheese from the Southwest of PR, such as the mapping of producers, preparation and publication of didactic materials, qualification actions carried out with producers, description of the production process, water and milk analysis, in addition to the physical-chemical, microbiological and sensory characterization of the cheeses. It presents a brief history of the creation of the Association of Artisanal Cheese Producers of Southwest Paraná (APROSUD) and also describes the legal issues involving the production of artisanal cheeses, as well as the challenges that still need to be faced to legitimize artisanal Colonial cheese from Southwest Paraná.	Primary sources: interviews, laboratory analyses and on-site visits. Secondary sources: historical data and teaching materials.
07	Porto <i>et al.</i> (2022)	Experimental research. This was a case study that evaluated the microbiological quality of brown cottage cheese commercialized in the city of Salinas, MG, and tested the efficiency of different processes with varying levels of adoption of safety practices in the pathogenic microbiota of brown cottage cheese.	Primary sources: laboratory microbiological analyses of experimental and commercial samples. Secondary sources: legislation and quality standards.
08	Silva <i>et al.</i> (2022)	A systematic review of the literature was conducted. To obtain the works, a search was made in the databases of Scielo, <i>Scopus</i> , <i>Web Of Science</i> and Database of Theses and Dissertations (BDTD).	Secondary sources: scientific articles, dissertations and theses reviewed in databases.
09	Ströher <i>et al.</i> (2024)	It presents an evaluation of the good practices applied in an agroindustry producing QAS in this region. On the occasion, the tools of good practices of the agroindustry installed on the property were	Primary sources: technical visits and <i>checklists</i> in certified property.

		evaluated, as well as the milking of the animals and the manufacture of the QAS.	Secondary sources: legislation and technical manuals.
10	Faria and Aveni (2023)	The work explores the legislation in the case of tolerance to the "type", and proposes to bring cases and examples that deal with such tolerance. It is, therefore, a bibliographic and internet research in the search for cases of use of the word "type" in labeling.	Secondary sources: national and international legislation, case analysis, and examples of labels collected online.
11	Ferreira e Costa (2021)	It used the legal-theoretical methodology, as well as deductive reasoning and transdisciplinary bibliographic research addressing reflections that permeate environmental and constitutional law, with an interface in anthropology, in addition to analysis in the legislative field.	Secondary sources: legal texts, legislative analyses and transdisciplinary studies.
12	Goulart and Pinto (2023)	A search was carried out on the Web of <i>Science</i> and <i>Scopus</i> search platforms using the terms "artisanal cheese" and "authorial cheese". Alerts were also received from Google with internet news on these two topics. It was observed that scientific research has as its main theme, when it comes to artisanal and authorial cheeses, the microbiological quality of these foods. The internet news broadcast to the population has as its main focus an event that took place in São Paulo, where the world cheese contest was held.	Secondary sources: data from scientific publications and news alerts categorized and statistically analyzed.
13	Rocha and Caldas (2023)	The methodology used consists of the use of bibliographic research procedures, through physical and virtual collections, with documentary, normative analysis and field survey. In addition, the perceptions obtained from visits to the municipality of Santa Bárbara-BA are added, in order to obtain information about the chosen object of study regarding its representativeness for the place, as well as the processes and technological innovations involved in its manufacture, and the challenges encountered for its recognition as a Geographical Indication (GI).	Primary sources: field survey and visits to local producers; Secondary sources: legislative analysis and institutional publications.

14	Benincá <i>et al.</i> (2020)	It is characterized as a qualitative research with a triangulated, exploratory and descriptive-interpretative study based on interviews with two owners of French agroindustries in the Department of Sarthe, France, in December 2019. The data collection instrument was a semi-structured interview questionnaire with guiding questions.	Primary sources: interviews and <i>on-site</i> observations. Secondary sources: bibliographic review and French and European legislation.
15	Cruz <i>et al.</i> (2020)	Using a qualitative approach, through semi-structured interviews and thematic oral history, it was sought to analyze and understand the social networks developed around the production and consumption of different types of cheeses from Marajó, the impacts on production and marketing, their characteristics considered essential in the maintenance and preservation of their quality, producers' view of changes in the production process, its difficulties, forms of resistance and permanence over time.	Primary data: interviews. Secondary data: scientific and historical literature.
16	Braccini <i>et al.</i> (2022)	The study appropriated a descriptive, exploratory and quantitative approach, as it seeks to reflect on the data recruited, seeking to outline the reality, through an exposition based on works and authors in the area. The data for this study come from a convenience sample of 121 consumers of Colonial Cheese (QC) in Santa Maria, Rio Grande do Sul State, Brazil.	Primary data: structured questionnaires. Secondary data: scientific literature.
17	Souza and Borges (2023)	In the study approach, qualitative research was defined. We studied aspects of the way of making cabacinha cheese, the regionalization and the identity of the artisanal product, especially with a couple of producers from Santa Rita do Araguaia (GO) and with a producer from Alto Araguaia (MT).	Primary data: interviews and field observation. Secondary data: cultural and historical literature.
18	Ströher, Silva and Nunes (2023)	Literature search was conducted in three databases, Google Scholar, <i>Scopus</i> , and <i>Web of Science</i> , using the following keywords: "colonial artisanal cheese" or "good manufacturing practices" or "colonial cheese" "microbiological analysis" using Boolean operators and quotation marks.	Secondary data: scientific articles on microbiological quality and food safety.

19	Silva <i>et al.</i> (2022)	In this study, a descriptive and exploratory research was used, based on a qualitative approach and focus on a case study, with the objective of understanding the challenges for the implementation of the GI of Jaguaribe Curd Cheese in Ceará. For a study of this nature, multiple and varied sources of evidence are needed.	Primary data: semi-structured interviews and direct observation. Secondary data: documentary analysis.
20	Ragazzon and Marconato (2023)	The field research was exploratory (since it aims to bring the researcher closer to the researched object) and descriptive, as it proposes to collect and analyze data, in order to identify whether SUSAF-PR contributed to improve the socioeconomic conditions of cheese producers in the Southwest region of the state.	Primary data: online questionnaires. Secondary data: legislation and technical literature.
21	Silva and Borelli (2020)	The following review presents information on the antagonistic activity of lactic acid bacteria and their ability to ensure the safety and quality of artisanal cheese.	Secondary data: scientific literature on lactic acid bacteria and microbiological safety.
22	Costa <i>et al.</i> (2022)	The work was carried out through a bibliographic review in different indexing databases to collect information on artisanal Minas cheeses. The main electronic databases used were <i>Scopus</i> , <i>Scielo</i> , <i>Science Direct</i> , <i>Web of Science</i> , <i>Wiley Online Library</i> and <i>Google Scholar</i> . The search was carried out using the keywords: "artisanal cheese", " <i>artisanal cheese</i> ", " <i>artisanal Minas cheese</i> ", "pingo", "sano-fermento", "rala", " <i>endogenous starter culture</i> ".	Secondary data: scientific, legislative and historical bases.
23	Pena <i>et al.</i> (2022)	Documentary and bibliographic review, with analysis of the resources for the protection of traditional knowledge in artisanal food production interpreted based on scientific production on the subject, published in the last five years. The resources analyzed in the study were: the registration of intangible assets of IPHAN, under Decree No. 3,551, of August 4, 2000; and the Geographical Indications (GI) granted by the BPTO, with the legal framework of Law No. 9,279, of May 14, 1996.	Secondary data: national legislation and recent scientific productions.

Source: The authors, 2024.

The data described in Table 6 show that of the 23 articles examined, 43.5% were dedicated exclusively to bibliographic or documentary research, using secondary data. This indicates a predominance of approaches based on theoretical review and document analysis. On the other hand, 26.1% of the studies were categorized as experimental research, in which primary data were collected, evidencing an expressive application of practical methods and the direct collection of information. Finally, 30.4% of the articles opted for a qualitative approach, with the collection of primary data through interviews or questionnaires, which highlights the importance of interpretative and exploratory analyses on the topic in question.

This distribution reveals the variety of methodological approaches used in research related to the certification of artisanal cheese. It combines the theoretical robustness of literature reviews with practical and qualitative studies, providing important insights for understanding the phenomenon.

With regard to the objects of study, the analysis addressed the geographic regions investigated in the selected articles. The studies covered a variety of locations, with an emphasis on rural areas involved in artisanal cheese production in Minas Gerais, highlighting the micro-regions of Cerrado and Serra da Canastra, as well as other parts of Brazil that face similar challenges, such as Goiás, Jacaré dos Homens (AL), Jaguaribe (CE), Marajó (PA), Mato Grosso, Nordeste, Rio de Janeiro, Salinas (MG), Southwest of Paraná and São Francisco de Paula (RS). A study was also carried out on cheese production in Le Mans, France. It is noteworthy that eight articles did not specify the region of the objects of study. Table 8 illustrates the objects of study and the regions investigated in each of the selected articles.

Table 8

Objects of study and region researched

No.	Quote	Objects of Study	Region
01	Araújo <i>et al.</i> (2020)	Bibliographic research on artisanal cheeses without defined location.	-
02	Campello <i>et al.</i> (2021)	Bibliographic research, focusing on the municipality of RJ. The objective is to verify the demand for the sale of raw milk and artisanal cheeses, through informal trade; the need to regulate the artisanal cheese market, especially in the state and municipality of Rio de Janeiro and the adherence to inspection	Rio de Janeiro-RJ

		systems by small producers, as a way to mitigate risks to public health.	
03	Azenha e Silva (2021)	Bibliographic research on artisanal cheeses without a defined object of study.	-
04	Silva e Melo (2020)	Macururé cheese has been produced for about 100 years by a single family, in the village of Caititu, located in the city of Jacaré dos Homens, AL.	Jacaré dos Homens-AL
05	Martinelli and Angels (2023)	Artisanal curd cheese for the northeast region.	Northeast
06	Cislaghi and Badaró (2021)	Artisanal Colonial Cheese from the Southwest of PR.	Southwest of PR
07	Porto <i>et al.</i> (2022)	Brown cottage cheese sold in the city of Salinas-MG.	Salinas-MG
08	Silva <i>et al.</i> (2022)	To investigate whether the production of artisanal cheeses meets the requirements established by the legislation in force in Brazil. For this, a systematic review of the literature was carried out.	-
09	Ströher <i>et al.</i> (2024)	A dairy farm located in the municipality of São Francisco de Paula-RS was chosen as the object of investigation for the evaluation of the GAP applied in the rural property and the GMP implemented in the agroindustry.	São Francisco de Paula-RS
10	Faria and Aveni (2023)	The work explores how Brazil faces challenges in the protection of Geographical Indications in light of new international agreements, especially in relation to the current tolerance of products without GIs, but marketed in a misleading way.	-
11	Ferreira e Costa (2021)	This work analyzes the importance of cultural heritage as a way of preserving the identity of a collectivity, focusing on the artisanal production of cheese in the state of Minas Gerais.	Minas Gerais
12	Goulart and Pinto (2023)	This study identifies the main interests of the scientific community and the population in relation to artisanal and authorial cheeses.	-
13	Rocha and Caldas (2023)	The object of study chosen concerns its representativeness for the place, as well as the processes and technological innovations involved in its manufacture, and the challenges encountered for its recognition as a Geographical Indication (GI).	-

14	Benincá <i>et al.</i> (2020)	The work evaluates the perception of cheese producers and veterinary technicians through interviews in Le Mans, in the Department of Sarthe, France, according to the social and sanitary aspects in relation to the production and commercialization of this product.	Le Mans, in the Sarthe department, France
15	Cruz <i>et al.</i> (2020)	It reflects on social networks developed throughout the cheese production system (butter and cream types) in Marajó/PA, Brazil.	Marajó-PA
16	Braccini <i>et al.</i> (2022)	This study explores the level of importance attached to sociocultural aspects, beliefs and preferences, food safety, and state regulation in the purchase of Colonial Cheese (QC).	-
17	Souza and Borges (2023)	It briefly addresses the history of cabacinha cheese, produced in two neighboring states: Goiás and Mato Grosso.	States of Goiás and Mato Grosso
18	Ströher, Silva and Nunes (2023)	It addresses the production and commercialization of colonial artisanal cheeses, with emphasis on microbiological parameters.	-
19	Silva <i>et al.</i> (2022)	It analyzes the process of implementation of the Geographical Indication of Curd Cheese from Jaguaribe-CE, pointing out the role of the agents involved, the main obstacles and challenges that prevent the advancement towards its implementation.	Jaguaribe-CE
20	Ragazzon and Marconato (2023)	To collect and analyze data, in order to identify the contribution of SUSAF-PR to improve the socioeconomic conditions of cheese producers in the Southwest region of the state.	State of Paraná - PR
21	Silva and Borelli (2020)	It is the analysis of the characteristics and benefits of the lactic acid bacteria present in artisanal Minas cheese, especially in relation to its antagonistic activity against pathogenic microorganisms.	Minas Gerais
22	Costa <i>et al.</i> (2022)	To present a literature review, contemplating the main characteristics of the producing regions and the aspects of each cheese produced.	-
23	Pena <i>et al.</i> (2022)	It addresses the issue of the protection and enhancement of cultural elements, which make up a food system, with a specific focus on food products produced under signs of cultural distinction. The article investigates how these foods, elaborated based on ancestral and geolocated knowledge, are perceived	-

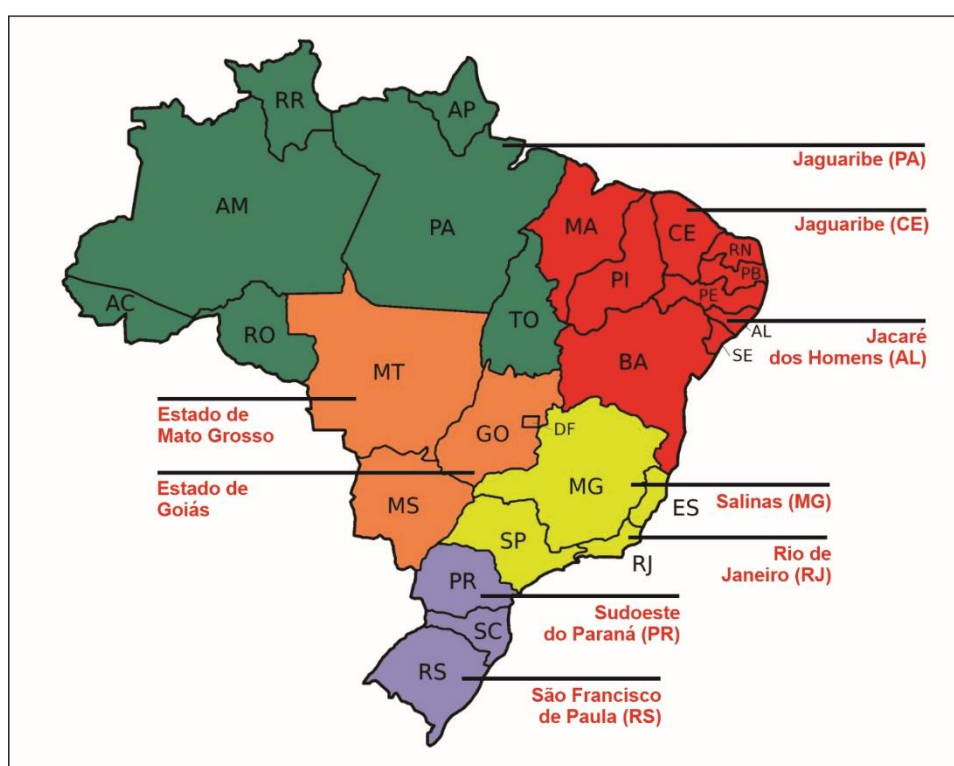
		as important alternatives in a global market, where food culture may be becoming homogenized and questionable.	
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Source: The authors, 2024.

The evaluation of the geographical dispersion of the chosen research shows a significant concentration of studies in certain areas of Brazil, evidencing the importance of the production of handmade cheese in these areas. Figure 2 illustrates in detail the areas analyzed, highlighting the federative units and micro-regions where the investigations took place, making it possible to observe the geographic extent of the research and detect trends in the location of producers and the difficulties encountered to certify artisanal cheese.

Figure 2

Map of the regions studied



Source: The authors, 2024.

The presentation of the regions studied is complemented by an illustrative image (Figure 2), which highlighted the geographical distribution of the objects of study and provided a visual and contextualized synthesis of the areas analyzed by these studies chosen for this research.

4.2 THEORETICAL APPROACHES TO ARTISANAL CHEESE AND THE ARTE SEAL IN THE WORKS INVESTIGATED

This second part of the results presented the theoretical foundations and main works used in the articles participating in this study in order to theoretically know the approach of these articles.

Table 9

Theoretical foundations of the articles studied

No.	Quote	Topics of the theoretical framework
01	Araújo <i>et al.</i> (2020)	Historical data related to cheese production in Brazil are controversial, both in relation to the period and the regions in which this practice was initiated. Minas Gerais was the first to develop its own legislation that enabled the artisanal production of cheeses with raw milk. The artisanal cheese production chain in Brazil has not been adequately regulated for decades, due to scarce, evasive or inefficient legislation. With the update of the Regulation of Industrial and Sanitary Inspection of Products of Animal Origin (Riispoa) (Brazil, 2017) and the regulation of the Arte seal (Brazil, 2018; 2019a), a series of state and municipal standards related to artisanal products, including cheeses, began to be developed and implemented. Theoretical critical foundation on: 1) the main types of artisanal cheeses produced in Brazil and their characteristics, 2) a historical presentation of the standards related to the production and commercialization of Brazilian artisanal cheeses and 3) a critical discussion on the challenges and perspectives for the development of new standards and their potential impacts on identity, quality and harmlessness of these products.
02	Campello <i>et al.</i> (2021)	2.1 Milk production and informal trade 2.2 The artisanal cheese market in Brazil and its regulation 2.3 Regulation of artisanal cheeses in the state of Rio de Janeiro 2.4 Adhesion to inspection seals
03	Azenha e Silva (2021)	Reasons why half-ripened cheese is considered susceptible to listeria <i>monocytogenes contamination</i> . About Listeriosis: mortality, incubation period, risk population and diagnosis.
04	Silva e Melo (2020)	Description of the Macururé cheese manufacturing process. Collection and transport of samples. Physicochemical analysis Microbiological analyses. Experimental design and statistical analysis of the data.
05	Martinelli and Angels (2023)	Digging up the roots of artisanal curd cheese. Potentialities of Brazilian valorization and safeguard devices. Expert reports on recovery and safeguard

		<p>devices. Perceptions about intangible cultural heritage. Perceptions about the labels of differentiation of agri-food products.</p> <p>Perceptions about geographical indications. Perceptions about the Arte label</p>
06	Cislaghi and Badaró (2021)	<p>Artisanal colonial cheese manufacturing technology. Physicochemical parameters of artisanal Colonial cheese from Southwest Paraná. Sensory characteristics of artisanal Colonial cheese and consumer perception.</p> <p>Microbiological quality of artisanal Colonial cheese from the Southwest of Paraná. Legislation for artisanal Colonial cheese</p> <p>Main difficulties in the production of artisanal Colonial cheese.</p>
07	Porto <i>et al.</i> (2022)	<p>Verification of the microbiological quality of brown cottage cheeses. Detection of <i>Salmonella sp.</i> Coagulase-positive staphylococci determination.</p> <p>Determination of total and thermotolerant coliforms.</p>
08	Silva <i>et al.</i> (2022)	<p>Brazilian legislation for the production of artisanal cheeses. There are several laws regulating production in the country, which undergo constant changes over time in order to ensure a product of excellent quality.</p>
09	Ströher <i>et al.</i> (2024)	<p>The Serrano Artisanal Cheese (QAS) has great economic, social and environmental importance in the northeast region of Rio Grande do Sul (RS), being a bicentennial and traditional product to the point of undergoing few changes over the years. And when adopted, good agricultural practices (GAP) and good manufacturing practices (GMP), together, make artisanal activity safer for consumers of these products. Thus, the GAPs on the property and the GMPs in the cheese factory end up providing refrigerated raw milk and artisanal cheese, respectively of good quality according to regulatory specifications.</p>
10	Faria and Aveni (2023)	<p>Tolerance in Brazilian law to foods that do not use the Geographical Indication seal, but continue to be marketed as long as they are under the nickname of the word "type" added to the name of the legitimate Geographical Indication. Ordinance No. 146 of March 7, 1996 published by the Brazilian Ministry of Agriculture, which regulates the production of cheese in the country, as well as Normative Instruction No. 22 of November 24, 2005, which allows products of animal origin manufactured according to technologies characteristic of different geographical places. In order to obtain products of animal origin with sensory properties similar or similar to those that are typical of certain recognized areas, the name of the product of animal origin must include the expression "type", with letters of the same size, prominence and visibility as those corresponding to the name approved in the regulation in force in the country of consumption, in violation of international treaties.</p>
11	Ferreira e Costa (2021)	<p>The manufacture of artisanal cheeses in Brazil, with emphasis on Minas Gerais, constitutes a valuable intangible cultural heritage, closely linked to</p>

		<p>traditional knowledge and regional identity. This process uses raw milk and manual maturation techniques that have been passed down from generation to generation.</p> <p>In the past, the absence of adequate regulation brought difficulties to the formalization of this practice, leading many producers to operate clandestinely. The evolution of legislation, especially with the introduction of the Art seal and state and federal regulations, sought to balance cultural preservation with sanitary requirements, promoting economic viability and ensuring the continuity of artisanal production.</p>
12	Goulart and Pinto (2023)	Main interests of the scientific community and the population in relation to artisanal and authorial cheeses.
13	Rocha and Caldas (2023)	Definitions and legislation involved with Geographical Indication (GI), which is a distinctive sign of Intellectual Property, for collective use, and refers to the recognition of a place that has become known for offering a unique product or service.
14	Benincá <i>et al.</i> (2020)	The production of artisanal cheeses, especially those made with raw milk, still remains a problem around the world. The analysis and understanding of the functioning of the production and market of these products in countries where they are traditional can be an important tool for the reproduction of know-how in other cultures. Current Brazilian legislation on the regulation for the production and commercialization of traditional cheeses made from raw milk and questions about the safety of consumption of these artisanal foods.
15	Cruz <i>et al.</i> (2020)	Production systems and product classification criteria. Criteria for evaluating food quality, reflecting in public policies and legislation that assume a "quality" based on conventional metric criteria, linked to industrial production, leaving small production in the background or even in informality. Process of (re)valorization and resignification of the rural and its products, connoting these meanings of reliability, healthiness and transparency in relation to the techniques used and, therefore, capable of providing safe and healthy food, leading to the construction of demands, new markets and consumption patterns with a strong territorial and cultural connection. Development of trusted social networks that strengthen and support local products and producers, enabling the continuity and preservation of differentiated and unique knowledge, production techniques, ways of life and products, aspects that have generally been neglected by official inspection and inspection standards.
16	Braccini <i>et al.</i> (2022)	The theoretical framework of the New Institutional Economics was used to examine sociocultural factors, beliefs and preferences, food security, and state

		regulation. The institutional environment. Informal and formal rules. Sanitary regulations for cheeses in Brazil.
17	Souza and Borges (2023)	The identities, the origin of cabacinha cheese and the regionalization of production in Brazilian culture.
18	Ströher, Silva and Nunes (2023)	Production and marketing of artisanal colonial cheeses, with emphasis on microbiological parameters. Good manufacturing practices.
19	Silva <i>et al.</i> (2022)	Geographical Indications (GI) and their importance. The process of implementing a GI. Main obstacles and challenges to the process of institutionalization / implementation of Geographical Indications in Brazil. Geographical Indication (GI) in Brazil and the potential of the State of Ceará.
20	Ragazzon and Marconato (2023)	Family agribusiness has transformed the rural environment in several aspects, bringing advantages in the social and economic area to producing families. Food legislation at the municipal, state and federal levels began to look at colonial and artisanal products as being traditional and began changes in the legislation, differentiating large and small foods, as is the case of family agribusiness. To support the agro-industrialization process, the state of Paraná, through the Secretariat of Agriculture and Supply (SEAB), established new regulations that instituted the Unified System of Attention to Agricultural Health, Family and Small Farming in the State of Paraná (SUASA-SUSAF-PR), and introduced the concept of uniformity, harmonization and equivalence between the inspection services of the municipalities of the territory of Paraná, in the inspected establishments.
21	Silva and Borelli (2020)	The artisanal Minas cheeses. Microbiological safety. Lactic acid bacteria. Antagonistic compounds produced by BAL (Lactic Acid Bacteria). Antagonistic activity. Resistance of pathogenic bacteria to the maturation process of cheeses.
22	Costa <i>et al.</i> (2022)	Characteristics of the manufacturing process of Minas Artesanal cheese. Pingo used in the manufacture of QMA. QMA producing regions: Araxá, Campos das Vertentes, Cerrado, Serra da Canastra, Serra do Salitre, Serro, Triângulo Mineiro, Serras da Ibitipoca, Diamantina and Entre Serras da Piedade ao Caraça.
23	Pena <i>et al.</i> (2022)	Intangible cultural heritage: the safeguard proposed by Iphan for the traditional know-how of food. The Geographical Indication as an instrument of intellectual property for the preservation of intangible heritage. Protection of the know-how of artisanal food products in Brazil: possible articulations.

Source: The authors, 2024.

The concepts and definitions related to artisanal cheeses emerge as a frequent theme in the academic literature, highlighting cheese as an intangible cultural heritage. The manufacture of artisanal cheeses in Brazil, exemplified by the Artisanal Minas Cheese (QMA), represents traditional knowledge, passed down from generation to generation, associated with regional identity and the use of raw milk, in addition to manual techniques for maturation. These activities maintain a deep connection with the local culture, as pointed out by Ferreira and Costa (2021), who underline the cultural and economic importance of cheeses made in Minas Gerais. Another fundamental aspect is legislation and certification, especially the Art Seal. The Industrial and Sanitary Inspection Regulation (RIISPOA) together with the Art Seal marked significant achievements in the regulation of artisanal cheeses, allowing their sale between states without compromising traditional practices.

According to Araújo *et al.* (2020), these regulations brought modernization to the production chain, raising quality and safety. However, research points to the obstacles faced by small producers to adapt to legal requirements without compromising the cultural authenticity of their products.

The Geographical Indication (GI) emerges as a crucial instrument to protect and enhance artisanal cheeses, ensuring their genuineness and connection to specific regions. Examples such as Artisanal Minas Cheese, recognized by IPHAN, demonstrate the positive effect of this certification on the strengthening of local economies and the preservation of traditional know-how (ROCHA; CALDAS, 2023). However, as pointed out by Silva *et al.* (2022), there are still difficulties and challenges in the institutionalization of GIs in Brazil.

Issues related to health and microbiology have been widely debated, focusing on the dangers linked to the consumption of raw milk and contamination by pathogens, such as *Listeria monocytogenes* and *Salmonella*. Research indicates that the adoption of good manufacturing practices (GMP) and good agricultural practices (GAP) is essential to ensure product safety and meet established standards, without compromising artisanal techniques (STRÖHER *et al.*, 2024; PORTO *et al.*, 2022).

In addition, the social and economic effects of artisanal production were highlighted as significant aspects. Family agribusiness has promoted transformations in the rural environment, boosting the local economy and valuing both culturally and territorially handicraft products. Ragazzon and Marconato (2023) point out that the creation of specific regulations for small producers was an important advance to ensure their sustainability and continuity.

4.3 CATEGORIES OF ANALYSIS AND SYNTHESIS OF THE ARTICLES UNDER STUDY

This section covered the analysis categories created from the content covered in the selected articles. It should be noted that many contents are related and the categorization sought to compile the themes involved in the studies, considering the complete content of each article. In all, three broad categories of analysis were created, namely: 1) Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses; 2) Legislation and Regulation and; 3) Physicochemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety. Table 10 describes the numbers and titles of articles included in each category.

Table 10

Analysis categories created

Category		Article No.	Title
1	Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses	19	Obstacles and challenges for the implementation of a geographical indication: the case of the curd cheese of Jaguaribe-CE
		17	The regional culture in the production of cabacinha cheese: a study based on subjects from Goiás and Mato Grosso
		13	A study of the cottage cheese of Santa Bárbara-BA for the recognition of Geographical Indication (GI)
		23	Gastronomic know-how in Brazil: intangible heritage and Geographical Indication as resources for its protection
		5	Valorization of Brazilian artisanal cheeses: Applicability of three distinctive quality signs for curd cheese from the perspective of experts
		6	Dilemmas of the production of artisanal colonial cheese in the southwest of Paraná
		20	The Socioeconomic Impact of SUSAF-PR on Cheese Dairies in the Southwest Region of Paraná
		22	Artisanal Minas cheeses – a brief review

		15	Social networks and preservation of artisanal cheese production methods on Marajó Island, PA
2	Legislation and Regulation	1	A historical-critical analysis of the development of Brazilian standards related to artisanal cheeses
		2	The paths to obtain the Art Seal in Rio de Janeiro
		10	The institute of geographical indication in Brazilian law and the tolerance of the word "type" on the label
		11	The protection of the cultural heritage of Minas Gerais by regulating the production and commercialization of artisanal cheeses
		16	Legality versus informality in the commercialization of colonial cheeses in southern Brazil: the consumer at the center of the debate
3	Physicochemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety	18	Microbiological quality of colonial artisanal cheese (QAC): impact of good manufacturing practices (GMP) - a systematic review
		12	Brazilian artisanal and authorial cheeses: what is said about these products in the media and in the scientific community?
		7	Microbiological quality of curd cheese produced in Salinas, MG: a Case Study
		3	Contamination by <i>L. Monocytogenes</i> in cheese
		21	The importance of lactic acid bacteria in the safety and quality of artisanal Minas cheeses
		9	Evaluation of good agricultural practices (GAP) and manufacturing practices (GMP) of an agroindustry of Artisanal Serrano Cheese (QAS) in Rio Grande do Sul (RS)
		14	Raw milk cheese: case studies with agro-industries and health surveillance in the Department of Sarthe, France
		4	Macururé cheese manufactured in Jacaré dos Homens, AL: physicochemical, microbiological and production characteristics

		8	Good practices in the production of artisanal cheeses: a systematic review of the literature
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Source: The authors, 2024.

The articles examined were classified into three main categories, which summarize the most common topics in research related to artisanal cheeses in Brazil: (1) Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses; (2) Legislation and Regulation; and (3) Physicochemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety. The category Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses is the one that contains the largest number of articles. These investigations emphasize the relevance of GI as an instrument to protect and enhance artisanal cheeses, ensuring their authenticity and their connection with specific regions.

In addition, the cultural and economic effects of regional production are discussed, highlighting how traditional knowledge expresses the identity of the producing communities. Objects of study of the selected articles included the curd cheese from Jaguaribe-CE and research on the local culture in the manufacture of cabacinha cheese in Goiás and Mato Grosso.

With regard to Legislation and Regulation, the articles analyze the challenges and progress of legal standards related to the production and sale of artisanal cheeses. The creation of the Art Seal and the regulation of Geographical Indications are considered relevant milestones for the formalization of this sector, although problems such as informality and the difficulty of following regulations persist. This category demonstrates the search for balancing technical and sanitary requirements with cultural preservation, with Minas Artesanal cheese being a significant example in this discussion.

Finally, the section that deals with Physico-Chemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety focuses on the microbiological safety and physicochemical parameters of artisanal cheeses. The investigations examine the presence of pathogens, such as *L. monocytogenes*, and highlight the relevance of good manufacturing practices (GMP) and agricultural practices (BPA) to ensure the quality and safety of products.

In addition, they address the influence of lactic acid bacteria on the safety and flavor of cheeses, in addition to the particularities of regional products, such as Macururé cheese, produced in Alagoas.

This investigation highlights the emphasis on themes related to cultural appreciation and regulation, while technical-scientific and sanitary issues emerge as a fundamental basis to ensure the quality and sustainability of artisanal production.

Each of these themes was explored independently, aiming to deepen the understanding of the contributions, difficulties and impacts on the scenario of artisanal cheese production in the country. This approach enabled a more detailed investigation of each category, highlighting the subtleties that define research in this area.

4.3.1 Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses

The Geographical Indication (GI) stands out as one of the most relevant mechanisms for the appreciation of artisanal cheeses in Brazil, ensuring their authenticity and link with specific areas. As pointed out by Silva *et al.* (2022), the implementation of the GI faces considerable bureaucratic obstacles, but its potential to leverage the regional economy is indisputable. The study deals with the curd cheese of Jaguaribe-CE, where the certification aims to reinforce the cultural identity and increase the value of the product.

Comparatively, Rocha and Caldas (2023) underline that GI acts as a tool for collective intellectual protection by recognizing regional products for their unique characteristics, as well as the quality linked to the place of origin. The research explores the cottage cheese of Santa Bárbara-BA, illustrating how GI can transform the local economy and preserve traditional knowledge, in addition to facing both technical and institutional challenges.

Souza and Borges (2023) comprehensively address the cultural and regional dimension when studying the production of cabacinha cheese in Goiás and Mato Grosso. The authors emphasize that this product represents an icon of the cultural identity of these locations, reflecting a historical heritage, passed down through the generations. Similarly, Pena *et al.* (2022) emphasize that gastronomic knowledge should be considered an intangible heritage, subject to protection through the Geographical Indication (GI), which strengthens both the culture and the economy of the regions involved.

In addition, the appreciation of artisanal cheeses, by distinctive signs of quality, is a prominent theme. Martinelli and Anjos (2023) investigate the effect of seals, such as the Art Seal and the GI, on curd cheese, pointing out the positive view of experts about the cultural and commercial advantages that these certifications offer. The authors state that such

initiatives not only ensure the protection of products, but also sustain the economic viability of the communities that produce them.

Social networks were identified as an important element in the preservation of production practices. Cruz *et al.* (2020) examine the influence of these platforms on cheesemaking on Marajó Island-PA, highlight how they help to preserve traditions and build trust between producers and consumers. This type of interaction is essential to reinforce the connection between the product and its place of origin.

In addition, studies on regional appreciation emphasize the socioeconomic impact of artisanal cheese production. Ragazzon and Marconato (2023) analyze the transformations resulting from SUSAF-PR in cheese dairies in southwestern Paraná, showing that differentiated regulation promotes local development and protects small producers. Costa *et al.* (2022) carry out a review of Minas Artesanal cheeses, highlighting the importance of certifications in the preservation of traditions and economic strengthening.

Thus, the articles examined show that the Geographical Indication works as an effective tool for the protection and appreciation of artisanal cheeses, uniting cultural, regional and economic dimensions. In addition, this approach proves to be a competent strategy to ensure the sustainability of these traditions and reinforce the identity of the producing communities.

4.3.2 Legislation and Regulation

The category referring to legislation and regulation underlined the relevance of legal standards and certifications, including the Art Seal and the Geographical Indication (GI), for the organization and development of the artisanal cheese market. While the greatest emphasis is on the cultural and economic aspects of artisanal cheese, regulations have played a crucial role in the formalization and growth of the sector. According to Campello *et al.* (2021), the Art Seal has proven to be an essential instrument to enable the commercialization of handicraft products between states, as evidenced in the case of Rio de Janeiro. The study points out that, despite significant achievements, adherence to the Art Seal still faces administrative and bureaucratic obstacles.

A relevant aspect discussed concerns the use of the term "type" on product labels that seek to refer to Geographical Indications (GIs). As noted by Faria and Aveni (2023), this practice can cause confusion among consumers, as it insinuates a connection with the quality

and authenticity of products with GIs, even if they do not meet the strict criteria required for certification.

The study criticizes this approach as an attempt to take advantage of the prestige of GIs, which weakens the valuation of truly certified products and compromises the credibility of the GI protection system in Brazil. Thus, the urgency of more intense control and specific regulations that prohibit the inappropriate use of terms that may deceive the consumer and discredit producers who comply with certification standards is highlighted.

Furthermore, Faria and Aveni (2023) address the legislation that regulates the use of the term, underlining its importance to distinguish products with certification of origin from those that only refer to tradition. This analysis emphasizes the need for stricter control in order to avoid confusion among consumers and ensure the protection of local producers.

Araújo *et al.* (2020) also highlight the evolution of legal norms by outlining a historical overview of Brazilian regulations related to artisanal cheese. The authors point out that, for decades, the sector has faced difficulties due to ambiguous and inconsistent legislation. However, significant advances, such as the Industrial and Sanitary Inspection Regulation (Riispoa) and the Art Seal, have brought significant improvements. Despite this, there are still challenges for small producers to adapt to the standards without compromising the authenticity of their products.

The regulation of Minas Artesanal cheese was addressed by Ferreira and Costa (2021), who emphasize the importance of balancing sanitary requirements with the preservation of traditional practices. The study proposes that legislation be adjusted to take into account regional and cultural particularities, favoring the inclusion of small producers in the formal market.

In addition, Braccini *et al.* (2022) draw attention to the duality between legality and informality in the commercialization of colonial cheeses in southern Brazil. The survey indicates that many producers still face difficulties in complying with legal standards, which limits their presence in the market and decreases their growth potential. This situation is compounded by the lack of institutional support and the complexity of regulations.

The five articles examined demonstrate that, despite the importance of legislation and regulation to ensure the quality and safety of artisanal cheeses, these aspects also impose considerable challenges on small producers. While initiatives such as the Art Seal represent significant progress, there are still opportunities for enhancements that favor greater inclusion and access within the sector.

4.3.3 Physicochemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety

The physicochemical and microbiological properties of artisanal cheeses are essential to ensure food safety and product quality. As presented by Porto *et al.* (2022), the brown cottage cheese from Salinas, MG, faces challenges related to microbiological contamination, especially with pathogens such as *Salmonella sp.* and *coagulase-positive staphylococci*. This study highlights the need to monitor these conditions in order to ensure the safety of the product.

Similarly, Silva and Melo (2020) emphasize the physicochemical and microbiological characteristics of Macuré cheese, produced in Jacaré dos Homens, AL. The research highlighted the importance of adopting good manufacturing practices to reduce the risks of contamination and maintain the sensory and nutritional qualities of the cheese.

Within the scope of good manufacturing and agricultural practices, Ströher *et al.* (2024) highlight that the implementation of GMP and BPA in an agroindustry that produces Serrano Cheese (QAS) in Rio Grande do Sul resulted in notable improvements in product quality and safety. These protocols ensured high-quality refrigerated raw milk, in addition to promoting the sustainability of artisanal practices in the region.

In addition, research has examined the effect of lactic acid bacteria on the microbiological safety of cheeses. As mentioned by Silva and Borelli (2020), these bacteria have antagonistic properties that fight pathogens and favor both the maturation and quality of Minas Artesanal cheeses. These compounds are essential to ensure the safety of products and enhance their sensory characteristics.

Finally, Silva *et al.* (2022) conducted a systematic analysis of best practices in artisanal cheese production, highlighting the importance of regulations that ensure product quality and reduce public health risks. The implementation of strict protocols has been linked to a substantial drop in contamination and increased competitiveness in the market.

These researches show that the combination of good manufacturing practices, microbiological monitoring and control of physicochemical characteristics are essential to ensure the quality and safety of artisanal cheeses. In addition, these measures help to maintain the cultural authenticity of the products and strengthen consumer confidence.

5 FINAL CONSIDERATIONS

The conclusions were formulated based on the objectives defined in this study, taking into account the results of the systematic review of the literature regarding the certification of Artisanal Cheese and the Art Seal. The comprehensive evaluation of the selected articles shows that most of the publications are in journals in categories A4 and B1, followed by categories B2 and C. The trend of publications over time shows that, even without a specific time frame, studies on the certification of artisanal cheese and the Art Seal began to grow from 2020 onwards, with 2023 presenting the highest number of publications among the articles participating in this study. The data showed that bibliographic and documentary research, based on secondary sources, were the most used methods in the articles examined. Qualitative research, which included interviews, and experimental studies also showed relevance.

The research themes cover several regions of Brazil, with emphasis on Minas Gerais, Paraná and areas of the Northeast. The main theoretical bases discussed the cultural importance of artisanal cheese, legal and regulatory difficulties, as well as good manufacturing practices and microbiological safety. These elements emphasize the relevance of certification in strengthening and protecting traditional knowledge associated with production.

Three categories of analysis were established to better organize the related subjects: (1) Geographical Indication (GI), Culture, Regionalism and Appreciation of Brazilian Artisanal Cheeses; (2) Legislation and Regulation; and (3) Physicochemical and Microbiological Characteristics, Good Manufacturing Practices and Food Safety. The distribution of studies among these categories was balanced, with a slight predominance of the first two.

In category (1), it was possible to conclude that the Geographical Indication plays a crucial role in the appreciation of artisanal cheeses, ensuring their authenticity and promoting the preservation of local traditions, in addition to strengthening the economies of the regions.

Category (2) revealed that, although the regulation has advanced with initiatives such as the Art Seal, there are still obstacles for small producers, who face difficulties in complying with the standards without compromising the authenticity of their products.

Finally, category (3) showed that the adoption of good manufacturing and agricultural practices, combined with microbiological control, are essential to ensure the quality and food safety of artisanal cheeses, contributing to greater competitiveness in the market.

The considerations on the certification of Artisanal Cheese and the Art Seal allowed an in-depth understanding of the theme, highlighting the cultural, economic and regulatory relevance linked to this practice. Moreover, this research offers significant practical contributions, particularly with regard to the consequences for public policy makers and policymakers. The evaluation highlights the need for actions that simplify access to certification, reduce bureaucratic obstacles, and provide technical and financial assistance to smallholder farmers. Likewise, the considerations presented can contribute to the creation of more efficient public policies, ensuring both the recognition of artisanal products and food security and competitiveness in the market.

The present study found limitations, such as the scarcity of comprehensive primary data, the dependence on secondary sources, and the concentration of research in certain regions of Brazil.

It is recommended for future research to explore how certification affects the view of consumers and to analyze the feasibility of modifications in regulatory rules that promote the insertion of small producers in the formal market. In addition, the evaluation of the export of certified artisanal cheeses can be vital to enhance the economic effect of this practice.

It is also suggested to expand the research universe through access to global databases and the execution of studies in other languages, particularly in nations with a tradition in the manufacture and certification of artisanal cheeses. In addition, future research may focus on primary studies, such as interviews with producers and consumers, experimental evaluations of the quality of certified cheeses, and case studies in regions with varying levels of regulation. The application of comparative methods between the effects of certification in Brazil and in other nations can also help in a more complete understanding of the problem.

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