PRODUCTION OF MILITO-TYPE CASSAVA FLOUR IN THE BRAZILIAN AMAZON REGION: A SYSTEMATIC REVIEW

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ABSTRACT

Objective: Identifying and describing the production stages of "milito" flour is important for standardizing the production process, preserving the product's identity, and promoting its commercialization and consumption through public policies. The objective of this study is to consolidate previous research and identify strategies to improve the quality and economic viability of "milito" flour production.

Theoretical framework: "Milito" flour is a unique product highly valued by consumers in Acre and is expanding to other Brazilian states. Although produced traditionally, the manufacturing process is not well characterized or documented, which may result in variations in quality among different producers and, consequently, loss of product identity.

Method: A systematic literature review (SLR) was conducted to identify the state-of-the-art research on "milito" flour in the Amazon region. The review was carried out by searching for scientific papers, regardless of the year, in three databases.

Results and conclusion: Only two studies containing any mention of "milito" flour were selected. The findings highlight the importance of identifying production sites and characterizing the manufacturing process of "milito" flour. The creation of a geographical indication (GI) for this product could increase its recognition throughout the country and encourage socio-economic and cultural development in the region.

Research implications: The creation of a GI could stimulate the implementation of public policies that support cassava cultivation and "milito" flour production, as well as other by-products that have not yet been commercially exploited.

Originality/value: This study fills a research gap by providing valuable information on "milito" production and can serve as a model for other regions interested in developing similar products. Promoting sustainable agriculture and generating income for local communities, especially small farmers, are important objectives of this study.

Keywords: Cassava Flour, "Milito" Flour, Production Process, Artisanal Production, Acre State.

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PRODUÇÃO DE FARINHA DE MANDIOCA TIPO MILITO NA REGIÃO AMAZÔNICA BRASILEIRA: UMA REVISÃO SISTEMÁTICA

RESUMO

Objetivo: Identificar e descrever as etapas de fabricação da farinha “milito” é importante para padronizar o processo de produção, preservar a identidade do produto e fomentar a sua comercialização e consumo por meio de políticas públicas. O objetivo do estudo é consolidar pesquisas anteriores e identificar estratégias para melhorar a qualidade e viabilidade econômica da produção da farinha "milito".

Referencial teórico: A farinha do tipo "milito" é um produto único e muito valorizado pelos consumidores no Acre, e está se expandindo para outros estados brasileiros. Apesar de ser produzida de forma artesanal, o processo de fabricação não é bem caracterizado ou documentado, o que pode resultar em variações na qualidade entre diferentes produtores e, consequentemente, perda da identidade do produto.

Método: Objetivou-se realizar uma Revisão Sistemática da Literatura (RSL), buscando identificar o estado-da-arte das pesquisas sobre a farinha tipo “milito” na região amazônica. A revisão foi conduzida a partir da busca de trabalhos científicos, independente do ano, em três bases de dados.

Resultados e conclusão: Foram selecionados apenas 02 estudos contendo algum tipo de menção à farinha do tipo “milito”. Os achados destacam a importância de identificar locais de produção e caracterizar o processo de fabricação da farinha de “milito”. A criação de uma Indicação Geográfica (IG) para este produto poderia aumentar o seu reconhecimento em todo o país e incentivar o desenvolvimento socioeconômico e cultural da região.

Implicações da pesquisa: A criação de uma IG poderia estimular a implementação de políticas públicas que apoiam o cultivo de mandioca e a produção da farinha “milito”, bem como outros subprodutos que ainda não foram explorados comercialmente.

Originalidade/valor: Preenche uma lacuna na pesquisa ao fornecer informações valiosas sobre a produção de “milito” e pode servir como modelo para outras regiões interessadas em desenvolver produtos similares. A promoção da agricultura sustentável e a geração de renda para as comunidades locais, especialmente para os pequenos agricultores, são objetivos importantes deste estudo.


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1 INTRODUCTION

The consumption and cultivation of cassava and corn were an important part of many civilizations that developed in the Americas before the arrival of Christopher Columbus. Archaeological and botanical evidence suggests that cassava was already being cultivated in 7,000 BC in the Midwest region of Brazil, 6,000 BC in the Andes and Central America, and in 4,500 BC in Mexico and the Caribbean (Giesso, 2018; Hawkes, 2014; Kent, 2016; Silva & Murrieta, 2014).

The cassava root is treated as the most important part of the plant, having a high moisture content (between 65% and 70%), which makes it highly perishable (Ajayi et al., 2015). The reduction of the product's water activity contributes to the production of various artisanal or industrial products, such as different types of flours, tucupi, cassava gums, and starches. Cassava is a staple food in the daily diet of low-income populations (Duarte et al., 2019). Nutritionally, it is considered a good source of energy, as it is rich in starch and also contains...
plenty of fiber, being widely used in the preparation of various other derived products such as beijus, biscuits, soups, porridges, pies, and breads (Lody, 2019). The roots can be eaten raw, roasted, or boiled in water and can be prepared alone or in combination with other starchy foods such as yams and sweet potatoes (Neves et al., 2017).

According to its use, cassava can be classified into two main categories: table cassava and industrial cassava. Table cassava usually belongs to the sweet variety, and most of it is sold fresh (Aparecido et al., 2020). The roots used in the industry must have white pulp, cortex, and film, without streaks, of large diameter, good conformation, and thin film, which facilitates peeling and ensures the quality of the final product. They must also have a high starch content, especially when used in the production of cassava starch (Panghal et al., 2019).

Flour is the product obtained by grinding the edible part of a plant, subjected to appropriate technological processes, identified by the word "flour" followed by the name of the plant origin, for example wheat flour, corn flour, rice flour, almond flour, among others (Ndjourènekeu et al., 2021). Cassava flour is the product obtained by lightly roasting grated cassava roots that have been previously peeled and washed. The product that undergoes a second stage of roasting is called roasted cassava flour (Uchechukwu-Agwa et al., 2015).

Most of the cassava flour mills in Brazil are made up of small family-owned businesses. These processing units are typically located near the plantations and have a simple and traditional appearance (Vilpoux et al., 2017). In general, both the harvesting and processing of cassava are carried out by the same community group, often members of the same family. The facilities are covered constructions, but usually open on the ground floor, using wooden equipment and utensils, without the application of Good Manufacturing Practices (GMP) (Silva et al., 2017). GMP describes the requirements that an industry must follow throughout the production process, from the screening of raw materials to the handling of finished products.

In Brazil, in order to be commercialized, cassava flour must meet the criteria established in Normative Instruction No. 52, of November 7, 2011, which describes the technical limits for classification, categorization, and quality standards (Brazil, 2011). Cassava flour can be classified into three groups, according to the manufacturing process: 1) dry flour, obtained from washed roots that are peeled, grated, pressed, sieved, and dried in an oven; 2) water flour, obtained by immersing peeled or unpeeled roots in water and fermented for a variable time, then peeled, grated, sieved, and dried in an oven to obtain a coarse-grained product; and 3) mixed flour, which is a mixture of dry and water flour (Brazil, 2011).

In Acre, the cassava flour produced in the municipality of Cruzeiro do Sul stands out (a municipality located in the Juruá River valley, 640 km from Rio Branco). This artisanal cassava flour presents unique characteristics (Quinzani et al., 2016), being widely appreciated in the region. However, another specific type of cassava flour has been standing out in the state of Acre, the "milito" flour. Popularly known in the northern region and produced in the municipality of Tarauacá-AC by settlers of the Joacy rubber plantation, "milito" flour has gained space in the regional food market, being increasingly present in Acrean cuisine. It is a flaked flour, elaborated in an artisanal way with sensory characteristics that differentiate it from other flours in the region, such as the flour from Cruzeiro do Sul - AC (Quinzani et al., 2016; Silva et al., 2020).

This study will conduct a systematic literature review to investigate the production of "milito" type flour in Tarauacá, a municipality in the northern region of Brazil. While the production of "milito" flour is a traditional practice in this area, there is limited knowledge on the production process, quality control, and market demand for this product. The objective of the study is to address this gap in knowledge by consolidating previously conducted research and identifying optimal strategies that have the potential to enhance the quality and economic feasibility of producing "milito" flour. By doing so, the study aims to help develop public
policies that support sustainable production and marketing of "milito" flour and other underexplored byproducts in the Tarauacá region.

The intended results of the study comprise imparting valuable knowledge to regional groups and cooperatives that produce "milito" flour, which could aid them in formulating productive marketing tactics and growing their consumer base. Additionally, the study aims to contribute to scientific knowledge on "milito" flour production by filling a research gap in the literature. This could potentially serve as a model for other regions interested in developing similar products, while promoting sustainable agricultural practices and generating income for local communities, especially small farmers.

2 THEORETICAL FRAMEWORK

2.1 Artisanal Cassava Flour Production in the State of Acre

The North Region leads the cassava production in Brazil with 36.1% of the national crop, followed by the Northeast Region with 25.1% and the South Region with 22.1% (Embrapa, 2018). The North and Northeast regions also have a significant concentration of rural establishments with agroindustries, representing 44% and 48% of the total, respectively (IBGE, 2017). Although cassava flour is a widespread food throughout the country, it is believed that the artisanal version of the flour is more common in regions with higher consumption, presenting variations in terms of formats and types of structures, and often being produced for communal use (Álvares, 2014).

The production of cassava flour in an artisanal way occurs in small family agroindustries called "flour houses", which consist of small structures built in rural areas and operated by local families (Cruz et al., 2022). This production process is categorized as artisanal because even though some of these structures have modernized with the use of electrical equipment such as ovens and motors to grind the roots, the method is the result of manual production or the use of traditional or rudimentary techniques, with skills, dexterity, quality, and creativity (Barbosa et al., 2012).

The artisanal production of cassava flour is an ancient tradition in several states of Brazil and has significant importance for family farmers, often being their main source of livelihood. In the state of Acre, the production of cassava flour has its origins in the 19th century when indigenous people came into contact with Northeastersnrs who worked in latex extraction for rubber plantation owners (Velthem & Katz, 2012). The identity of the region as a producer of cassava flour was formed after the decline of this activity in the 1940s caused by the rationalized cultivation in rubber plantations of English colonies in Asia, which changed the regional economic structure. The production of cassava flour became an alternative for the region during the transition to agribusiness (Álvares et al., 2017).

The majority of the "flour houses” in the state of Acre are simple and rustic, having a basic structure and low use of inputs, as well as not having large capital investments (Cruz et al., 2022). In addition, the production is done in an artisanal way and often linked to family labor, which makes large-scale production difficult. This can result in variations and heterogeneity in the final product, which can become a problem in meeting the demands of an increasingly demanding market (Lima Junior et al., 2017; Souza et al., 2017; Siqueira et al., 2022).

In Acre, the flour houses have adapted their physical structures over time to meet the good manufacturing practices required for all food industries to comply with regulations established by the National Health Surveillance Agency (Anvisa) and the Ministry of Agriculture, Livestock, and Supply (Mapa) (Peniche, 2014). However, the produced cassava flour still maintains its artisanal characteristic, with the use of handcrafted artifacts and
knowledge passed down from generation to generation, resulting in a typical and recognized quality flour (Álvares et al., 2022).

The artisanal production of cassava flour in Cruzeiro do Sul stands out as the main byproduct of cassava in the state of Acre, being recognized for its unique characteristics (Gomes de Freitas et al., 2012). For several decades, the product gained recognition first at the regional level and then throughout the country due to its unique taste and texture that other cassava flours do not possess. In addition, its production follows a traditional pattern that is intrinsically linked to natural, cultural, and historical agricultural practices (Brito & Silva et al., 2023).

The flour known as "milito" from Tarauacá is another locally produced artisanal flour that has been gaining attention, and it differs from Cruzeiro do Sul flour in terms of its sensory properties. However, due to the lack of uniformity in the artisanal manufacturing process, which is mainly based on traditional techniques used in local flour houses, the valorization and industrial production of the flour are limited. This results in a wide variety of artisanal flour types and prevents its standardized commercialization throughout the country, restricting production to local consumer markets.

The classification of cassava flour is influenced in a different way by the stages of the artisanal production process (Álvares et al., 2022). It is therefore crucial to follow GMP to ensure satisfactory product sorting. It is essential to carry out regular and scheduled maintenance of the equipment and utensils used in the flour mill, in addition to specific care at each stage of the manufacturing process. In general, there is no standardization of these steps among the various flour mills in the state of Acre, which gives a high variability in the final product (Álvares et al., 2021).

Figure 1 shows the steps of the traditional artisanal processing of cassava flour in the order they are performed.

![Figure 1: Traditional artisanal processing stages of cassava flour. Source: Adapted from Álvares et al., 2022.](image)

Due to the small-scale production and artisanal manufacturing method, there is a wide variation in traditional cassava flour, which often prevents compliance with the Normative Instruction No. 52/2011 from the Ministry of Agriculture, Livestock, and Food Supply (Mapa), which establishes minimum quality standards (Silva et al., 2015). Nevertheless, artisanal flours do not lose their own quality characteristics, highly valued by consumers from the North and Northeast of Brazil, such as typical flavor, crispness, and aroma.

The stages of artisanal cassava flour processing have distinct impacts on its classification, changing the product's quality requirements (Fernandes et al., 2013). The study conducted by Álvares et al. (2022) investigated the stages involved in the handmade process of cassava flour production and how each of them affects the final classification of the product. During the first stage, manual peeling, it is crucial to completely remove the peel fragments, as their presence can cause the formation of dark particles and alter the ash content of the flour,
affecting the product classification. The ash content is determined by the mineral salts present in the flour, which are obtained by burning the organic matter.

In the second stage, crushing, especially when turmeric is used, affects not only the color but also the ash content of the flour. Turmeric is added by some farmers in this stage due to the preference of local consumers for a yellowish product. However, care must be taken as high concentrations of this spice interfere with the ash content of the flour. Furthermore, according to the study by Álvares et al. (2022), many farmers from the state of Acre claim that leaving the gum, known as starch, is a factor that contributes to the differentiated quality of the flour, and therefore there is great variation in this stage, as removing the gum would reduce the starch content in the flour, a detail that has a significant impact on the final product classification.

During the pressing stage, if it is done at hot times of the day or for too long, the dough can ferment, resulting in an increase in the acidity of the flour. As for the sifting stage, the choice of sieve type can affect the final product classification due to variations in the meshes and the use of commercial sieves specific to other products. In the whitening stage, the experience and skill of the roaster are crucial to obtaining a flour with ideal particle size and crispiness, which results in a great variation in the moisture content of flours produced by different processes. Finally, the toasting stage determines the moisture content of the flour, which affects its crispiness and durability during storage. The moisture content is one of the most important factors for the preservation of the flour (Ferreira et al., 2021).

The quality of the flour is evaluated based on characteristics such as color, particle size, and texture, and it is one of the factors that determine its price, which can vary in cycles of high and low prices. Buyers evaluate these attributes empirically, and the flours considered of better quality are sold at differentiated prices (Álvares et al., 2017).

3 METHODOLOGY

The aim of this study is to fill the knowledge gap surrounding the production of "milito" flour in Tarauacá, Brazil by conducting a systematic literature review. Through this systematic literature review (SLR), the study will consolidate prior research and pinpoint optimal techniques that can enhance the quality and economic feasibility of "milito" flour production.

Between July and December 2022, the SLR was conducted using the Scielo, Scopus, and Web of Science databases, which provided ample resources for the research. For the SLR, the methodology recommended by Michel-Villarreal et al. (2019) was applied, with adaptations, through a 3-step search strategy: "Review planning", "Review conduct" and "Reporting and dissemination". The three SLR steps are exemplified in Figure 2 below.

![Figure 2: Steps of Systematic Literature Review](source: Adapted from Michel-Villarreal et al., 2019.)
A 3-steps approach was used to narrow down and select the most relevant studies, as shown in Figure 2. In Step 1, the search was conducted using the keywords, resulting in one article and one thesis. In Step 2, the titles and abstracts of the found works were read with inclusion/exclusion criteria, and these two works were kept for the next evaluation phase. In Step 3, the full text of the two selected works was read according to the inclusion/exclusion criteria. Finally, the two evaluated works were kept for further analysis.

A comprehensive research process was conducted on the electronic databases Scopus, Scielo, and Web of Science, with no publication date limitation. The main keywords and their synonyms were concatenated using the "OR" and "AND" operators to construct the search strings that were used to identify relevant studies.

The review included peer-reviewed journal articles, books, undergraduate course papers, master's dissertations, and doctoral theses that mentioned the production, commercialization, and/or consumption of "milito" type flour. Research studies that did not explicitly discuss the context of "milito" flour production were excluded. Duplicate articles were not considered. In addition, articles written in languages other than Portuguese or English were also excluded.

The primary articles were selected according to the search string listed with the following combination of keywords and inclusion of the study in one of the global databases listed below the keywords. The search string, which was prepared with the keywords used for the study, is as follows: " Milito flour " AND "Acre" OR "Production of flour" AND "Tarauacá".

The methodology used in this study was crucial in identifying and selecting the most relevant studies related to the production of "milito" flour in Tarauacá. The 3-step search strategy allowed for a thorough SLR, which helped consolidate prior research and pinpoint optimal techniques for improving the quality and economic feasibility of "milito" flour production. This study provides valuable insights and directions for future research in this field.

4 RESULTS

The search for scientific studies on milito-type cassava flour was extensive, yet only two sources were found, consisting of one article and one undergraduate thesis. The authors carefully studied each source to identify areas for improvement in the production, distribution, and consumption of milito flour. These references in these works were brief, relating to the raw material (cassava) used in the production of "milito" flour, the consumption of this product by the local population (Silva, 2020), and the location/origin (Tarauacá) of "milito" flour (Quinzani et al., 2016). Table 1 provides a general overview of studies.

<table>
<thead>
<tr>
<th>Author</th>
<th>Study Details</th>
<th>Year</th>
<th>Mention of Milito Flour</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILVA, B. E.</td>
<td>Type of study: undergraduate course papers</td>
<td>2020</td>
<td>• Raw material used in the production of milito flour.</td>
</tr>
<tr>
<td></td>
<td>Title: Demystification, gastronomic potential and biodiversity: an experience report from Acre</td>
<td></td>
<td>Consumption of milito flour in local cuisine.</td>
</tr>
<tr>
<td></td>
<td>Source: Federal University of Rio de Janeiro</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUINZANI, S. S. P; CAPOVILLA, V. M; CORRÊA, A. A.</td>
<td>Type of study: Article</td>
<td>2016</td>
<td>• Local/origin of production of &quot;milito&quot; type flour.</td>
</tr>
<tr>
<td></td>
<td>Title: Gastronomic Pluralism of Amazonic Region: tastes from Acre, Pará and Alto do Rio Negro</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Source: Revista Hospitalidade</td>
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</tbody>
</table>

Source: Authors (2023).
These results demonstrate the need for in-depth studies involving the physical-chemical and microbiological characterization of this product, as well as the characterization of the manufacturing process. This will create essential scientific knowledge of a product with cultural aspects of a region.

Cassava flour is the staple food of many Brazilian states, especially in the North and Northeast, where it is consumed by rural, riverine, and urban populations of all social classes, according to the customs of the various regions, such as meat and fish-based accompaniments (Corrêa & Silva, 2021). Cassava flour can be used to make a variety of dishes and products, such as bread, cakes, cookies, noodles, and pancakes. It is also used as a thickener in soups, stews, and sauces (Lody, 2019). Additionally, it can be used to make gluten-free and grain-free alternatives to traditional wheat flour products.

Although cassava flour is a significant food product, there is a lack of sufficient quality standards to classify all types of flour, primarily due to the use of artisanal manufacturing processes (Neves et al., 2017; Silva et al., 2017; Vilpoux et al., 2017). Furthermore, the "milito" flour lacks a characterization of its manufacturing process, which poses challenges in implementing policies to improve the manufacturing process, especially in terms of adhering to GMP.

The primary issues with the current production of cassava flour are its inconsistent quality and significant variation in composition, which can be affected by factors such as the age and type of the plant and the time lapse between harvesting and processing (Filho et al., 2013). Other factors such as crop management, climate, soil, and culture also contribute to the variability of cassava flour quality (Klang et al., 2020). However, the processing method is seen as the main factor responsible for the quality of cassava flour (Neves et al., 2017; Ndjouenkeu et al., 2021).

To minimize the variation in product quality, it would be necessary to define a set of GMPs by creating a workflow diagram with technical guidance for the processing stages, such as defining pressing time, oven temperature, and toasting techniques (Arvanitoyannis & Traikou, 2005). These criteria, combined with traditional knowledge, would help to promote uniformity in the production process, reduce efforts, and ensure higher product quality.

5 DISCUSSION

Acre is known for its great cultural diversity and biodiversity, as well as for the presence of different populations with ethnic, cultural, and traditional knowledge particularities that together form the socio-biodiversity (Acre, 2016). To protect and preserve this common heritage of humanity, Geographical Indications (GIs) represent an innovative alternative. Through the delimitation of the production area, GIs make it possible to identify the origin of a product, thus protecting its local and regional characteristics and attesting to its quality, which is the result of both natural factors and human intervention (Cabral & Palomino, 2019).

Throughout time, some cities or regions are renowned for their exceptional products or services. Whenever a product or service's quality or tradition can be traced back to its place of origin, GI plays a crucial role in securing its protection and differentiation in the market, while also enabling the creation of added value (Belletti et al., 2017). The GI is a long-lasting tool that establishes the production area and restricts the use of the region's name solely to the producers within that area, often brought together in representative entities. Furthermore, the GI maintains local standards and prevents others from misusing the region's name in their products or services (Giovannucci et al., 2010).

In 2017, Cruzeiro do Sul flour became the first product in Brazil to obtain the GI seal, highlighting its origin and quality (Embrapa, 2022). Milito flour produced in Tarauacá could
also pursue GI recognition, just like Cruzeiro do Sul flour. This innovative method for safeguarding products aims to distinguish the product’s origin by identifying its production area.

5.1 Potential of "Milito" Type Flour for Granting Geographical Indication (GI)

GI is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin (Belletti et al., 2017). The "milito" type flour is a product that has the potential to receive it, which can be constituted in two forms: Indication of Provenance (IP) and Denomination of Origin (DO). While IP attests to the reputation of the origin of products/services, DO ensures the quality or characteristics related to the place (geographical environment) of origin (Inhan Matos & La Rovere, 2017).

Implementing a GI can bring various benefits to the production of local products, such as building a relationship of trust between producers and consumers, protecting against fraud and imitation of product names, and ensuring authenticity through labeling. GIs also promote unique historical backgrounds, specific local manufacturing techniques, and distinct characteristics associated with their place of origin, which help maintain a good reputation and distinguish them from similar products from other regions (Dagne, 2015). Figure 3 will illustrate the necessary steps for obtaining a GI.

Figure 3: Phases of the analysis procedure for obtaining GIs.
Source: Adapted from INPI, 2021.

According to the Brazilian National Institute of Industrial Property (INPI, 2021), the phases of the analysis procedure for obtaining Geographical Indications are as follows: first, the quality of each product is verified and proven through documentary evidence of its notoriety, which may include registration data, newspaper publications or articles. Second, objective data are presented to demonstrate that the products are distinct from those of other regions, for example, in their composition. Third, the authenticity, reputation or other characteristics of the products are confirmed as originating from their respective geographical areas (climate, soil) and/or from human factors of the region, such as exclusive production methods.

The implementation of GIs represents a new market opportunity for Amazonian products, as well as adding an important competitive advantage for traditional populations, such as riverside communities, indigenous peoples, and quilombolas, who cultivate exotic and regionalized products and deserve to be identified and valued. GIs present a potential avenue for fostering the advancement of regions characterized by their unique identity and exceptional products, such as the production of milito flour in Tarauacá, Acre.

The implementation of a GI for the "milito" type of cassava flour would bring recognition and value to the product nationally and contribute to socioeconomic and cultural development in the region. The GI could promote sustainable production practices, preserve cultural heritage, and foster new business opportunities and markets while guaranteeing product quality and authenticity for consumers. Investing in research and promotion of local products is crucial to preserve cultural diversity, promote sustainable development, and enhance regional competitiveness globally (Souza et al., 2021).
6 CONCLUSION

The SLR has revealed the importance of cassava flour as a food product, especially in the North and Northeast regions of Brazil, highlighting the lack of studies that characterize the manufacturing process and quality of this product. Although the "milito" type of flour is consumed by local populations, few scientific studies mention this variety of flour, which reinforces the need for more in-depth studies on its physicochemical and microbiological composition, as well as the characterization of its manufacturing process.

Cassava flour is a very important food for the Brazilian population, however, the lack of uniformity and great variation in composition is a problem that affects the quality of the product. This inconsistency can be influenced by several factors, such as the type and age of the plant used, the interval of time between harvesting and processing, aspects of cultivation, climate, soil, and culture. Despite this, the lack of standardization in the production process has been identified as the main factor responsible for the quality of the flour. The processing method plays a crucial role in determining the quality of cassava flour. Therefore, it is essential to minimize variations in product quality by defining a set of Good Manufacturing Practices (GMPs).

Creating a Geographic Indication (GI) for the "milito" type of cassava flour produced in Tarauacá would be a way to achieve national recognition for the product and stimulate socioeconomic and cultural development in the region. However, to accomplish this, more studies providing detailed information on the quality of the flour and its production process are necessary to meet the criteria for obtaining the GI. Thus, it is crucial to invest resources in scientific research on cassava flour and its production processes in order to promote sustainable development in this important production chain.

REFERENCES


