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Geographical indication and technical regulations for artisanal pasta filata cheese: technological, physicochemical and microbiological characteristics

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Geographical Indication (GI) is a legal instrument of protection that officially recognizes that a product has qualities, reputation, or characteristics intrinsically associated with its geographical origin. Minas Artesanal Cheese (MAC) has a Technical Regulation of Identity and Quality (TRIQ), which establishes normative criteria for its standardization, including physical-chemical and microbiological parameters. The GI guarantees that only cheeses produced in the delimited area and in accordance with the TRIQ can use the regional name, ensuring the authenticity of the product, traceability, and the valorization of the producing territory. In addition to MAC, artisanal pasta filata cheeses stand out, such as Cabacinha cheese, in the Vale do Jequitinhonha, which has its own TRIQ and has been recognized as an intangible cultural heritage of the state, although it does not yet have a formal GI registration. Technologically, pasta filata cheeses undergo the stretching of the curd in hot water (≈ 65 °C), a step absent in the MAC process. For this reason, they cannot be called MAC, but rather Artisanal Cheeses of Minas. Other regions of Minas Gerais, such as the municipality of Jequeri, produce pasta filata cheeses and still require the development and validation of a specific TRIQ, a step prior to requesting GI recognition. To assist in microbiological characterization, culture-dependent methods (counts and isolation in selective media) and culture-independent methods (metataxonomics and shotgun sequencing) can be used in a complementary way to understand the microbial biodiversity associated with the product. Physicochemical characterization involves analyses of moisture, pH, titratable acidity, total fat, total dry extract, fat in dry extract, total protein, salt content, ash, and water activity, essential parameters for defining the technological profile and compliance with technical regulations. For cheeses like Cabacinha and other pasta filata cheeses, the consolidation of technical standards and

the progress towards recognition as a GI are strategic steps for preserving cultural heritage, adding value to the product, expanding markets, and promoting sustainable regional development.

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