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Área do trabalho: Indústria de produtos de origem animal e ciência dos alimentos

### Goat's milk as a source of antihypertensive peptides released by hydrolysis using protease produced by *Mucor guilliermondii* URM 5848

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Goat milk has high biological value proteins in its composition, qualifying it as a food with high nutritional value. In addition to representing great importance in children's nutrition due to its hypoallergenic characteristics and greater digestibility, compared to cow's milk. Linked to this, in recent decades, the field of functional foods has been an expanding area due to the importance of the health benefits that these foods can provide. In this sense, benefits have been attributed to the consumption of milk and its derivatives, such as reducing the risk of cardiovascular problems and type 2 diabetes, are some of the advantages reported in the literature. Several substances with these beneficial properties have been described along with their functionality in the body's physiology. Among these compounds, there are biologically active peptides, that have a positive impact on the functions or conditions of the body and can influence health. Therefore, the objective of the present work was to evaluate the antihypertensive potential of peptides released from goat casein by proteases produced by the filamentous fungus *Mucor guilliermondii* URM 5848. Initially, raw milk was collected from a dairy herd of Saanen goats and immediately stored at 4°C. The milk was skimmed by centrifugation (2100 x g for 30 min at 32°C) and total casein was obtained by isoelectric precipitation at pH 4.2 with 1 M HCl. For casein hydrolysis, a purified protease produced by the filamentous fungus *Mucor guilliermondii* URM 5848, was used. Hydrolysis occurred at 40°C with an enzyme:substrate ratio of 1:15, over time (1, 3, 5, 8, 12 and 24 hours). Subsequently, the assays were centrifuged at 5000 x g at 4°C and the supernatant used to obtain a pool of peptides between 3 and 10 kDa, using Amicon Ultra-15 (Merck Millipore). The antihypertensive activity was performed according to the methodology described by Holmquist et al. (1979) with modifications (Asoodeh; Yazdi; Chamani, 2012), which uses FAPGG as substrate. All activities were carried out in triplicate. Statistical analysis was performed using IBM SPSS v.25 software, through analysis of variance (ANOVA), followed by Tukey's test to compare means ( $p < 0.05$ ). The antihypertensive activity varied between  $20.57 \pm 1.49\%$  (1 hour) and  $51.43 \pm 0.37\%$  (12 hours). There was no statistically significant difference between the 3- and 5-hour tests, presenting results of  $41.14 \pm 2.23\%$  and  $43.42 \pm 2.18\%$ . However, after 24 hours of hydrolysis, the antihypertensive activity dropped to  $14.85 \pm 1.25\%$ , indicating that excessive hydrolysis was harmful to the released peptides, with the breakdown of amino acids important for the analyzed activity. The results obtained highlight that the study of hydrolysis over time was essential to evaluate the best hydrolysis conditions to obtain peptides with antihypertensive activity. Furthermore, the peptides obtained from goat casein can be widely explored by the food industry, for the manufacture of functional dairy products, based on goat milk, which help control consumers' blood pressure, thus strengthening dairy goat farming in Brazil, mainly in the Northeast region.

**Keywords: functional foods, bioactive peptides, blood pressure**