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Evolution of the Free Amino Acid Profile in Ewe's Milk Cheese Throughout Ripening

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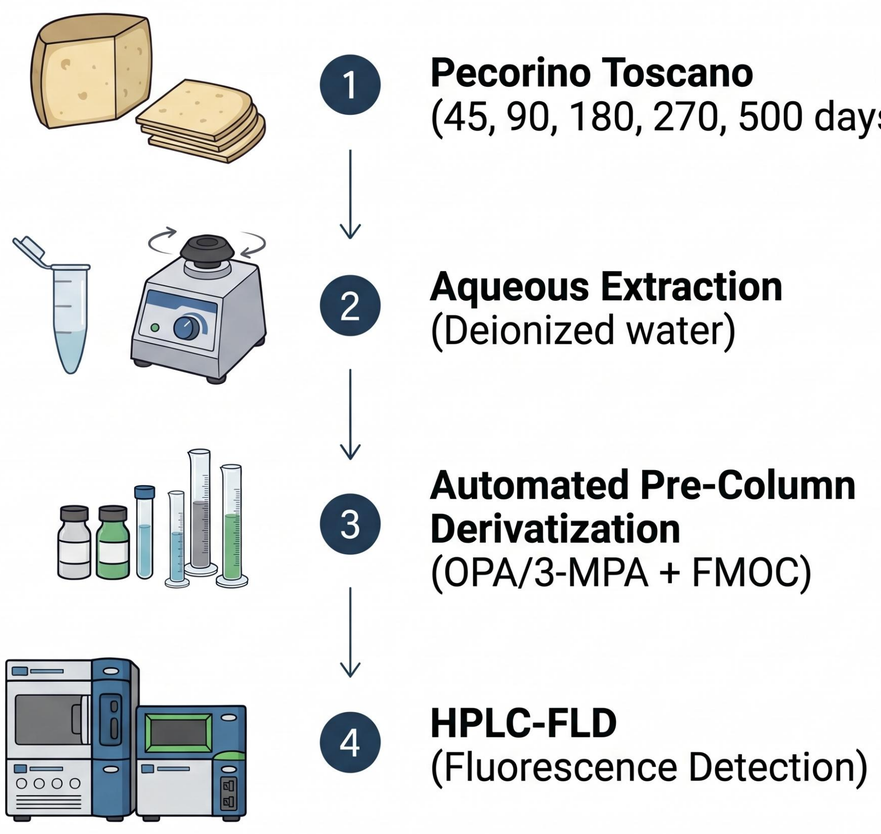
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Introduction

In the dairy sector, ewe’s milk cheese production is highly valued for its nutritional profile. During ripening, complex biochemical transformations occur, shaping the physicochemical and sensory attributes of the final product. In this context, profiling free amino acids provides valuable insights into cheese proteolysis and allows tracking dynamic changes throughout the ripening process. This study aimed to evaluate the free amino acid profile of ewe’s milk cheese across different ripening times.

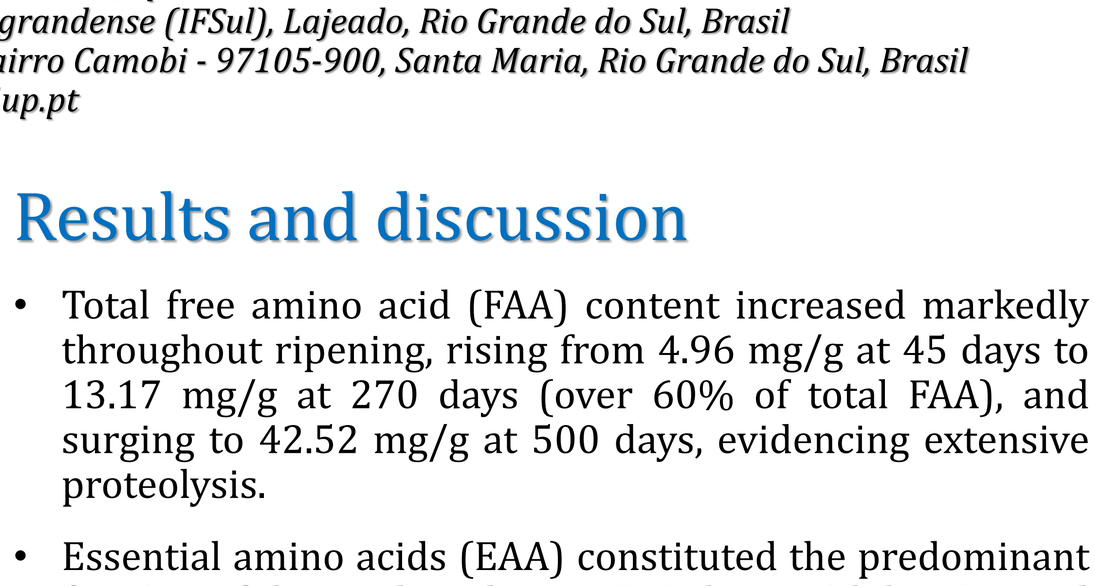
Material and methods

Pecorino Toscano-type cheeses manufactured from pasteurized ewe’s milk were ripened for 45, 90, 180, 270, and 500 days. Following extraction with deionized water and automated pre-column derivatization (OPA/3-MPA and FMOC), free amino acids were quantified by high-performance liquid chromatography coupled with fluorescence detection (HPLC-FLD).



Results and discussion

- Total free amino acid (FAA) content increased markedly throughout ripening, rising from 4.96 mg/g at 45 days to 13.17 mg/g at 270 days (over 60% of total FAA), and surging to 42.52 mg/g at 500 days, evidencing extensive proteolysis.
- Essential amino acids (EAA) constituted the predominant fraction of the total pool up to 270 days, with leucine and lysine being the most abundant.
- At 500 days, a pronounced surge in non-essential amino acids, particularly glutamic acid (7.66 mg/g) and aspartic acid, reshaped the profile.



Conclusion

These results demonstrate that ripening time plays a crucial role in promoting free amino acid release, simultaneously enhancing the nutritional value regarding bioavailable essential amino acids and fostering the distinctive flavour profile of Pecorino-type ewe's cheese.

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