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Description of Ewiss cheese, a new ewe's milk cheese processed by Swiss cheese manufacturing techniques: microbiological, physicochemical and sensory aspects

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Abstract

Typically, Swiss-type cheese is made from cow's milk. However, in the present work an attempt to expand the sheep supply chain and product offering in this field was made by developing a new type of cheese using Swiss-type cheese technology. The cheese was manufactured under industrial conditions, and fermentations were carried out using freeze-dried commercial starters that are traditionally used in the production of Swiss cheese. Two experimental "Ewiss cheese" (EC) products were produced using raw milk (RM-EC) and pasteurized milk (PM-EC), respectively. No statistical differences ($p > 0.05$) were found for the levels of lactic acid bacteria (LAB) during all steps of cheese making. Undesired microbiological groups were found only in the curd of raw milk cheese in the range of 10^4 - 10^5 CFU/g, but reaching undetectable levels in the cheese at the end of ripening (9 months). RM-EC and PM-EC were characterized by 76% and 68% of dry matter, respectively. These cheeses contained 29.30% and 34.36% of protein, and 51.31% and 50.38% of fat, respectively. Textural analysis showed differences in terms of hardness, chewiness, and gumminess between the experimental cheeses. The main fatty acids in the cheeses were palmitic acid, myristic acid, oleic acid, and capric acid. Among the organic acids, RM-EC had higher concentrations of lactic acid, while PM-EC was higher in propionic acid. The ewe's cheeses emitted forty-six volatile compounds, including acids, aldehydes, ketones, esters, alcohols, and other compounds. PM-EC was characterized by the main compounds of Swiss-type cheese: acetic acid, butyric acid, ethyl butyrate, ethyl caproate, propanoic acid, and tetramethylpyrazine. Sensory evaluation showed that the PM-EC was the most preferred by the judges. This research has enabled the development of new ewe's milk products, which could stimulate the valorization of a sector that has been long neglected and still has a large margin of improvement.

Keywords

ewe's cheese, novel dairy products, Swiss-type cheese, microbiological safety, sensory evaluation