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INFLUENCE OF STARTER CULTURE CONCENTRATION ON THE SENSORY AND PHYSICO-CHEMICAL CHARACTERISTICS OF BRIE CHEESE

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Abstract

This article reports on the comparative analysis of Brie cheese wich was prepared using a different concentration for the starter culture and how this concentration influences the organoleptic and physicho-chemical characteristics of the final product. The appearance, color, consistency, odor and taste were sensory evaluated for three different samples using with a starter culture in a proportion of: 0,4%, 0,5% and 0,6%. The physico-chemical determinations of Brie cheese samples: moisture, fat content, fat content in dry matter, salt content, titratable acidity and pH were measured to characterize and evaluate the quality of the final product.

•Introduction

Brie cheese falls into the category of mold-ripened cheeses with florid rind, characterized by the development of a white rind, due to the action of Penicillium candidum. Starter cultures are essential in the cheesemaking process, influencing both acidification and the development of the final flavor and texture. In the production of Brie, lactic acid starter cultures (such as Lactococcus lactis subsp. lactis and Lactococcus lactis subsp. cremoris) are used to initiate the fermentation of milk, which leads to a reduction in pH and protein coagulation.

•Material and method

The following raw and auxiliary materials were used in the preparation of the Brie cheese manufacturing recipe: pasteurized whole milk with 3.5% fat, a production starter culture, mold spore culture, natural rennet (chymosin), calcium chloride, and salt. For inoculation, a starter culture containing Streptococcus lactis and Streptococcus diacetylactis, along with a sporulated mold culture of Penicillium candidum, was used.

This study highlights how the concentration of the starter culture can influence the acidity of the cheese and the formation of the curd. The sensory characteristics assesed by each individual evaluator were: appearance, color, consistency, smell and taste, using the consumer acceptability score.

The physico-chemical determinations: moisture, fat content, fat content in dry matter, salt content, titratable acidity and pH were measured to qualitatively characterize the obtained samples of the Brie cheese.

•Results and discussions

The sample with the lowest concentration of starter culture received the highest overall scores, especially for color and taste, while the sample with the highest concentration had the lowest ratings across all sensory attributes. From physico-chemical point of view, the moisture content decreased from the first to the third sample, while the fat content in dry matter increased. The second sample had the highest overall fat percentage, and the third sample had the highest fat in dry matter and the lowest moisture.

Higher acidity levels result in a firmer curd. This occurs because acid causes milk proteins, particularly casein, to coagulate more tightly, expelling more whey and creating a denser structure. A higher acidity increases elasticity and has results in a softer cheese texture, while a lower acidity leads to a firmer, more crumbly texture. Acidity also affects the melting properties of the cheese. The ability to melt smoothly is often compromised when acidity is too high. Another significant impact of acidity is on shelf life. Higher acidity creates environment for spoilage bacteria and pathogens, thereby extending the shelf life of the cheese. This preservation benefit is one reason why some aged or fermented cheeses can remain edible for long periods without refrigeration.

•Conclusions

Changes in acidity affect the protein structure of the cheese, which in turn determines the final product characteristics. From texture to flavor, the level of acidity not only shapes the sensory experience of cheese but also determines its quality and longevity on the shelf of the final product.

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