

**TECHNOLOGICAL STUDIES ON
MOZZARELLA CHEESE FROM EGYPTIAN
BUFFALO MILK**

BY

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B.Sc. Agric. Sc. (Dairy Science), Cairo University, 1993
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ABSTRACT

Wafaa Mahmoud Salama Mansour. Technological Studies on Mozzarella Cheese From Egyptian Buffalo Milk. Unpublished Doctor of Philosophy Thesis, Ain Shams University, Faculty of Agriculture, Food Science Department, (2005).

This study was planned to improve the functional properties of Egyptian buffalo milk Mozzarella through either lowering Ca^{++} content by using chelating salts or modifying the casein micelle in the milk with proteolytic agent, or by both methods together. The research was carried out into three parts. In the first part, sodium polyphosphate (SPP) as calcium chelating salt was added either to buffalo milk before coagulation (section, A) in ratios of 0.025%, 0.050% and 0.075% or to cheese kneading water (section, B) in ratios of 0.5%, 1.0 % and 1.5%. Samples of resultant Mozzarella cheese were analyzed for chemical, physical and sensory properties when fresh and weekly up to four weeks during storage at refrigerator ($5\pm 2^\circ\text{C}$). Cheese yield increased with adding SPP into milk or kneading water by different proportion being affected with SPP ratio. Addition of SPP to buffalo milk or kneading water enhanced to certain extent the meltability and stretchability and decreased the firmness and free oil of Mozzarella. The microstructure of buffalo Mozzarella revealed that addition of SPP resulted in better protein solubility with much more fiberness and open structure. The sensory quality of buffalo Mozzarella was improved with main reflection on body and texture of cheese with adding SPP in milk or kneading water.

In the second part of study, buffalo milk was treated with proteolytic enzyme (protease) in ratios of 16, 32 and 48 units. Treating buffalo milk with protease significantly increased the moisture content of cheese and therefore the cheese yield increased. Meltability and stretchability were improved by treating the milk with protease but the addition caused a slightly higher oil separation. Buffalo Mozzarella had better fiberness structure and higher wateriness of body with treating the milk by protease. The best buffalo Mozzarella was produced by treating the milk with up to 32 units of protease.

The third part of the research was conducted to improve functional properties of buffalo Mozzarella using combinations of calcium chelating salt (SPP) and proteolytic agent (protease). The synergistic effect of both SPP and protease on buffalo Mozzarella characteristics was more obvious than the effect of each separately. All treatments showed better meltability and stretchability with lower oil separation and all were organoleptically acceptable. Buffalo Mozzarella with best quality can be produced using protease and SPP in combination of 16 units + 0.025 % respectively.

Key words: Mozzarella–Buffalo–Functional properties–Yield–Meltability–Stretchability– Microstructure.

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