ISSN 1110-0419

Annals Of Agric. Sc., Moshtohor,
Vol. 46(1): Fo. 53-67, (2008).

YIELD IMPROVEMENT AND PRODUCT QUALITY OF MOZZARELLA CHEESE FROM COW MILK FORTIFIED WITH DRIED SKIM MILK OR DRY MILK PROTEIN CONCENTRATE

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ABSTRACT

Mozzarella cheese was produced from cow milk fortified with dried skim milk (DSM) in ratios 2, 4, 6% or dry milk protein concentrate (MPC) in ratios 0.5, 1, 2%. Control treatment of Mozzarella was made from fresh untreated cow milk. Resultant Mozzarella cheeses were analyzed fresh and followed up to 4 weeks during storage in refrigerator for its physicochemical properties (moisture, total protein, ash, lactose, pH value, soluble nitrogen, total calcium, and total volatile fatty acids, TVFA). Functional characteristics (meltability, firmness, stretchability and oil separation) and sensory quality attributes were also determined. Actual yield, cheese microstructure and texture profile were estimated in fresh treatments. Fortifying cow milk with DSM and MPC increased significantly the actual yield being higher with higher ratio of added materials. Mozzarella cheese of cow milk fortified with DSM or MPC showed lower moisture and pH while ash, lactose, total calcium, total protein, soluble nitrogen, and TVFA values were significantly increased. Meltability and stretchability of Mozzarella were not significantly affected by adding DSM or MPC to cheese milk except in highest ratios of DSM and MPC. Mozzarella cheese fortified with MPC showed much better functional properties than that of DSM. The microstructure of fortified Mozzarella cheeses revealed that addition of DSM or MPC resulted in denser protein strands and close structure. Mozzarella cheese showed higher hardness, gumminess, and chewiness with low springiness by adding DSM or MPC to cow milk. All treatments were sensory acceptable showing higher significant quality attributes in treatments with MPC than that of DSM being best in treatment with 1% MPC. Storage of Mozzarella caused a significant increase in SN, TVFA, meltability, stretchability and oil seperation while moisture, lactose, and firmness were decreased.

Key words: Yield, Mozzarella, Functional properties, Dried Skim milk, Milk protein concentrate, Texture.

INTRODUCTION

Mozzarella cheese has a unique property called stretchability to form fibers or strings when heated which depends on its pH and proportion of colloidal calcium phosphate that has been removed (Ghosh and Singh, 1996). With the spread of fast foods, especially pizza stores, the annual production of Mozzarella cheese has been increased in USA from about 705 thousand tons (1990) to reach up to 1.277 thousand tons in 2006 (AAE, 2006). Mozzarella is an irreplaceable cheese for pizza because of its strechability, and it has a number of precise functional requirements. There has been a sharp increase in the consumption of pizza worldwide, resulting in high demand for Mozzarella or Pizza cheese. Mozzarella cheese classified as a semi hard cheese is regularly produce a lower yield percentages especially with cow milk. Increasing Mozzarella cheese yield without affecting