

PRODUCING OF PROBIOTICS MONTEREY CHEESE AND STUDY ITS CHEMICAL COMPOSITION

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ABSTRACT

Chemical composition of three manufactured Monterey cheese (Control Monterey cheese (C), therapeutic Monterey cheese with the single probiotic strain (A) and therapeutic Monterey cheese with mixture probiotic strains (B)) by adding probiotics bacteria was studied at 0, 14, 28 and 42 days of ripening period. Moisture content decreased in all manufactured Monterey cheese (C, A and B) during the ripening period, protein and fat content increased after 42 days of ripening period and reached 23.41, 23.78 and 23.63% respectively for protein whilst 31.20, 31.03 and 30.43% for fat. Salt and ash content in manufactured monterey cheese by using a mixture of probiotics strains was higher than both manufactured monterey cheese with single probiotic strain and control product (without probiotics)

Key Words: Probiotics, Monterey cheese, Chemical composition.

INTRODUCTION

Tended attention went to fortify food with vital supplements by using therapeutic bacterial strains with a healthy effect in order to improve consumer health and immunity. It has been shown evidently the close link between food and health not only on the development of the disease levels, but also skipped it to combat the disease itself, so the studies tended to produce many manufactured foods especially dairy products due to increasing its consumption as a result because they contain vital supplements, which represent the appropriate means to deliver these supplements to the consumer, the therapeutic cheese represents a favorable environment for keeping vital supplements since this product is a suitable carrier of the bacteria and the most important advantage that these products are therapeutic when they contain no less than 6^{10} CFU/g to perform a therapeutic role by improving the balance of intestinal flora, and getting back the real balance of intestinal flora requires the presence of 80-85% of the vital supplements and for this reason, recently the concept of therapeutic food became common (Vetvicka and Vetvickova, 2016).

Castro *et al.*, (2015) defined functional foods; those foods that contain some health-promoting components that go beyond the traditional nutrients; one way in which foods can be modified to become functional is by adding probiotics, in addition to the viability of probiotics in cheese, the incorporation of probiotic bacteria should not affect the sensory characteristics (flavor, texture, and appearance) of conventional (non-probiotic) cheeses. Although several studies have shown that probiotic cultures didn't considerably affect the Sensory quality of cheese, it is thought that their addition might contribute to different flavors and texture characteristics (Karimi *et al.*, 2012 a, b).

The ingestion of cheese supplemented with pro-biotic bacteria has been associated with a variety of benefits to human health, such as improvements in the immune system, improvements in oral and intestinal health in the elderly and reinforcement of intestinal immunity (Lollo *et al.*, 2012; Albenzio *et al.*, 2013a, b).

The study aims to use probiotics (*Lactobacillus acidophilus* and *Bifidobacterium longum*) bacteria in manufacturing of Monterey cheese to study the chemical changes of manufactured cheese and comparing it with traditional Monterey cheese.

MATERIALS AND METHODS

Milk: Cow milk was obtained from an agricultural research station (College of Agriculture/University of Basra) and was used in cheese manufacturing.

Rennet: Microbial rennet (*Rhizomucor pusillus*) was obtained from Meito Sangyo Co LTD, Japan was used in cheese manufacturing.

Starters: *Lactococcus lactis ssp. lactis* and *Lactococcus lactis ssp. cremoris* from Chr-Hansen (Denmark), *Lactobacillus acidophilus* probiotic bacteria for the single starter and *Bifidobacterium longum* & *Lactobacillus acidophilus* for the mixture starter from CVS/Pharmacy (Japan).

Monterey Cheese: Traditional Monterey cheese manufactured according to Kosikowski (1970). For probiotic Monterey cheese with single probiotic strain was manufactured by adding 10% of *Lb. acidophilus* 10^{10} CFU/g after adding the starter and following the same steps of the manufacturing procedure. While therapeutic Monterey cheese with mixture probiotic strains was manufactured by adding 10% of (*Lb. acidophilus* and *Bif. Longum*) 10^{10} cfu/g after adding the starter and following the same steps of manufacturing procedure. The ripening time was 6 weeks at 16°C and 85% humidity.