Production of Kefir from synergism between probiotic bacteria and yeast: Therapeutic and nutritional aspects

A Thesis

Submitted in Partial Fulfillment of the Requirement for the Degree of M.Sc. in Microbiology

By

Aliaa Talat Gaber Ali

(B.Sc. Microbiology, 2007)

DEPARTMENT OF MICROBIOLOGY

FACULTY OF SCIENCE

AIN SHAMS UNIVERSITY

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Supervision Sheet

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To my dear Father, Dr. Talat.

To my Mother

ABSTRACT

Kefir is fermented milk product which had many health benefits, this include anti-microbial, anti-inflammatory and metabolic benefits. The most importantly, many studies have proven that kefir may have strong antimicrobial activity and anti-cancerous potential. In this study, sterilized low fat cow milk was inoculated with different concentrations of starter microbial culture inocula (3, 4, 5, 6% V/W) and incubated at 20□C for 24hr. The protein content, ash, and total solids contents increased with the increase of kefir inocula concentration. The highest concentration of microbial starter culture (6%) was accompanied with the highest value of protein content (4.51- 4.85%), while the pH values ranged from 4.48 to 5.52. On the other hand, the lactose content decreased as the concentration of starter microbial inocula increased from 3 to 6%. Also, Fat contents decreased as the concentration of starter microbial inocula increased, especially in kefir products T3 where the fat content decreased from 0.96 to 61%. Total solids increased and moisture contents decreased as the starter microbial concentration increased (3-6%). There was an inverse relationship between syneresis and penetration characteristics of the differently prepared kefir products. The prepared Kefir types T5 and T6 gave the best score of sensory evaluation compared to other preparations. Different types of kefir products had the strong inhibitory effect against each of G (-ve) bacteria (*Escherichia coli* (ATCC 8739), *Salmonella enteritides* (ATCC 14028), G (+ve) bacteria *Staphylococcus aureus* (ATCC25923), *Bacillus subtilus* (ATCC6633)) and *Candida albicans* (ATCC 10231). There was a gradual increase of the mean of inhibition zone in parallel with the

increase of concentration of microbial starter inocula from3-6% .In this study, the concentration inocula of 6% accompanied with the highest inhibitory effect for the five different pathogenic microbial strains, especially in the kefir type T6.

According to the effect of kefir on the experimental animals, the body and organs weights had significantly increased, while the values of the tumor marker CA19.9 had decreased. The results of biochemical analysis revealed that the feeding of experimental animals on different types of kefir led to the increase values of each of HDLc, potassium, sodium and protein. On the other hand, kefir products led to the decreased values of total cholesterol, LDLc, AST and ALT.

Key words: kefir- chemical composition-syneresis- penetration- sensory properties- antimicrobial- anticancer.

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