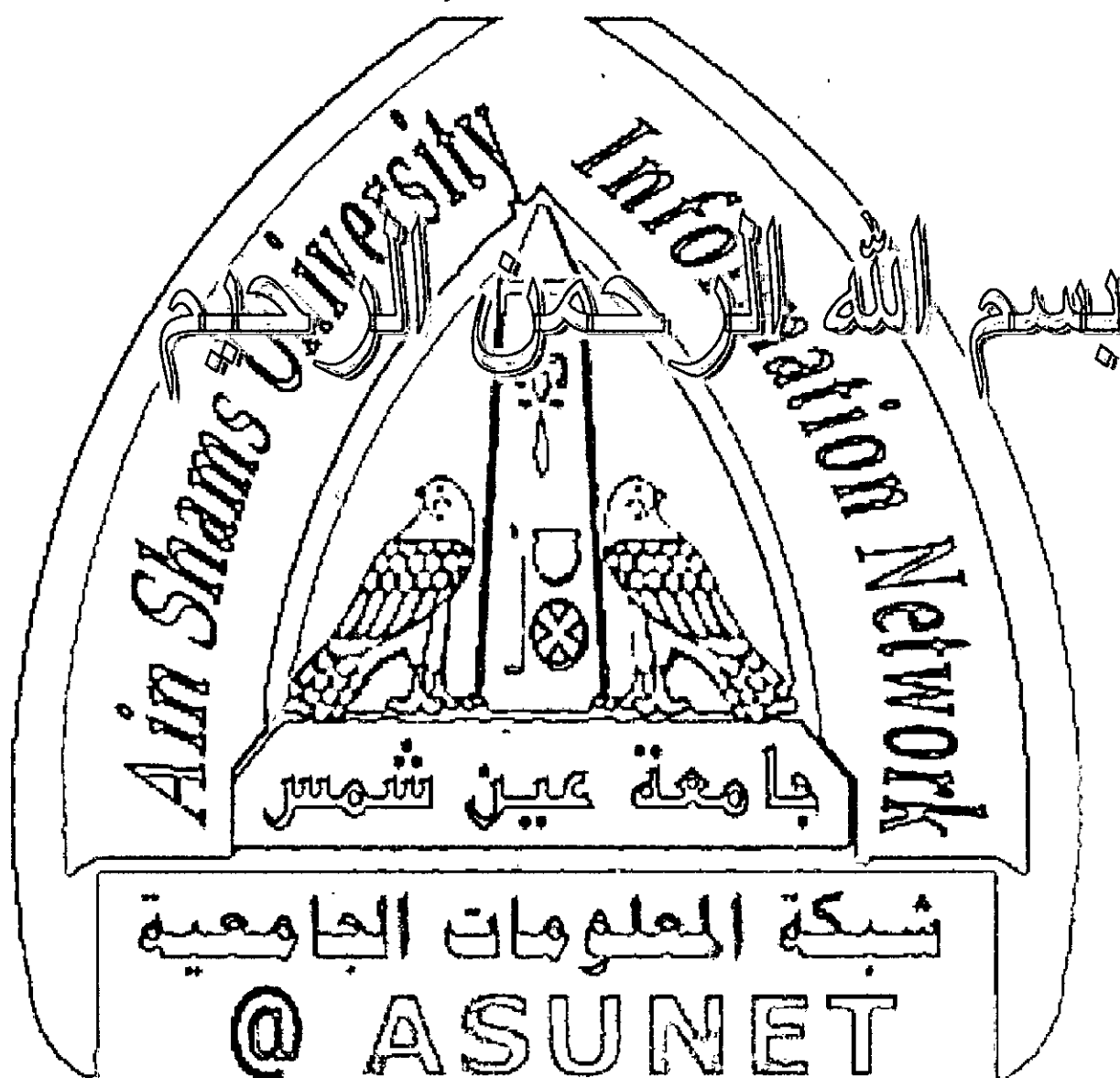




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**THE HEALTH POTENTIAL ROLE OF
YOGHURT AND SOY-YOGHURT
CONTAINING BIFIDOBACTERIA**

By

FARAG ALI SALEH IBRAHIM

B.Sc. Agric. (Dairying), Ain Shams Univ. 1991.

M.Sc. Agric. (Dairying), Cairo Univ. 1997.

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TO

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Faculty of Agriculture

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2002

30.12.02

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ
الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَىٰ وَلَدِي
وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ
وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ
الصَّالِحِينَ

صَدَقَ اللَّهُ الْعَظِيمَ.

مِنْ آيَةِ (١٩) سُورَةِ التَّوْبَةِ

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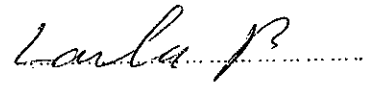
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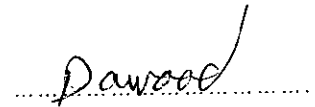
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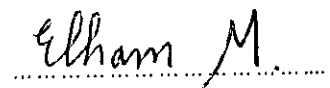
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ABSTRACT

The potential role of yoghurt and soy-yoghurt containing bifidobacteria was investigated in three parts.

Part (I): The hypocholesterolaemic effect of the probiotic yoghurt and soy-yoghurt in rats fed on a cholesterol-enriched diet.

The dietary probiotic yoghurt Bb-12 & Bb-46 and soy-yoghurt Bb-12 increased significantly the body weight gain in contrast with the dietary cholesterol free diet. There were significant differences in the plasma and liver lipids concentration among the two negative (cholesterol-free diet) and positive (cholesterol-enriched diet) control groups. The addition of the probiotic and non-probiotic supplementation to the cholesterol-enriched diet had a markedly affect on the plasma and liver lipid levels. Of the supplementation ingredients, probiotic yoghurt and soy-yoghurt containing *Bifidobacterium* Bb-12 and Bb-46 were most effective on lowering plasma and liver cholesterol concentration followed by non-probiotic products (plain yoghurt and soymilk). Compared to the cholesterol-enriched diet (positive control), both probiotic yoghurt and soy-yoghurt Bb-12 & Bb-46 resulted in a significantly lower plasma total cholesterol, VLDL+LDL-cholesterol and triglycerides levels as well as liver cholesterol and triglycerides concentrations. *Bifidobacterium* Bb-46 containing yoghurt and soy-yoghurt were more affective in the lowering of plasma and liver cholesterol levels than that of corresponding containing *Bifidobacterium* Bb-12. The probiotic yoghurt and soy-yoghurt Bb-12 & Bb-46 remarkably enhanced faecal bile acid excretion. There were an inverse relation between the faecal bile acid excretion and plasma & liver cholesterol levels.

Part II: Antimicrobial activity of probiotic yoghurt and soy-yoghurt against *Escherichia coli* and *Staphylococcus aureus*.

There was a sharp decline in bifidobacterial count of all treatments (probiotic yoghurt and soy-yoghurt) during the refrigerated storage period. The number of yoghurt culture in plain and probiotic yoghurt inoculated with or without test organisms decreased gradually in all of these treatments during refrigerated storage period. Probiotic yoghurt containing Bb-12 and Bb-46 exhibited a slight pH drop and slight increase in the titratable acidity compared with plain yoghurt during the refrigerated storage period. In the probiotic soy-yoghurt made with Bb-12 and Bb-46 inoculated with and without test organisms, pH-values were higher than the corresponding values in the plain and probiotic yoghurt containing Bb-12 & Bb-46, over the refrigerated storage period. Probiotic yoghurt containing Bb-12 and Bb-46 inoculated with or without test organisms showed sharper increase in lactic and acetic acids contents than the corresponding values in plain yoghurt direct after the incubation time, and these increasing continued for acetic acid only, during the refrigerated

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storage period. Direct after incubation time and during the refrigerated storage period, plain yoghurt and probiotic yoghurt containing Bb-12 and Bb-46 inoculated with or without test organisms showed a considerable increase in lactic and acetic acids than the probiotic soy-yoghurt containing Bb-12 and Bb-46 which produces not only lactic and acetic acids but also formic acid. The counts of *E.coli* in all treatments decreased direct after incubation time and during the refrigerated storage period. *E.coli* counts were disappeared in probiotic yoghurt, soy-yoghurt and plain yoghurt after 2, 3 and 5 days of storage, respectively. The counts of *S.aureus* decreased in all treatments direct after the incubation time and during the refrigerated storage periods. The growth of *S.aureus* was not detected in the probiotic yoghurt containing Bb-12 and Bb-46 after the 10th day of storage. Low numbers of *S.aureus* survived in the plain yoghurt and probiotic soy-yoghurt Bb-12 & Bb-46, after 15 days of cold storage.

Part III: Inhibitory effect of probiotic yoghurt and soy-yoghurt on Ehrlich ascites tumor cells.

The effect of probiotic yoghurt and soy-yoghurt containing *Bifidobacterium* Bb-12 & Bb-46 on the inhibition of Ehrlich ascites tumor cells were investigated *in vitro* and *in vivo* studies

1. *In vitro* studies.

Bifidobacterium Bb-12 and Bb-46 cultivated in MRS broth medium exhibited the highest inhibitory effect on the Ehrlich ascites tumor cells, where % dead tumor cells reached 85.42 & 94.74% and 85.10 & 94.00% after 2 and 24h of incubation time, respectively. In case of supernatant, the corresponding ratios were 77.61 & 83.33% and 71.43 & 88.06%, respectively, while the precipitate fraction of *Bifidobacterium* Bb-12 and Bb-46 showed the lowest effect, where the corresponding ratios were 4.00 & 16.07% and 9.09 & 11.11%, respectively. The probiotic yoghurt and soy-yoghurt treatments were the highest effective as inhibitory effect on the Ehrlich ascites tumor cells, where % dead tumor cells. The heat-treatment at 85°C was decreased the inhibition effect on the Ehrlich ascites tumor cells of all test treatments compared with before heating.

2. *In vivo* studies:

Feeding on diet containing tested products resulted in variable differences in body weight and body weight gain compared with control group. The count of feces bifidobacteria were the highest in the group fed on probiotic yoghurt and soy-yoghurt containing Bb-12 and Bb-46. The probiotic soy-yoghurt and yoghurt groups exhibited the highest life span and accordingly the survival rate. Although the increase in life span of all tested groups compared with those of control group, the difference was significantly only in case of mice fed on diet containing probiotic soy-yoghurt Bb-12 and Bb-46, whereas in the other groups was not significantly different from the control.

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