



*Institute of African Research and Studies
Department of Natural Resources*



Cairo University

**SUPPLEMENTATION OF SOME DAIRY PRODUCTS
WITH SOME MICROELEMENTS FOR IMPROVING ITS
NUTRITIONAL VALUE IN EGYPT AND ETHIOPIA.**

A Thesis

**Submitted in Partial Fulfilment of the Requirements
For The Degree of Doctor of Philosophy (Ph.D.).**

By

MOUNIRA MOHAMED AHMED MOHAMED

B. Sc. Agric, Sc. (Agric. Biochemistry), Ain Shams University (1981)
M.Sc. (Biochemical Agricultural). Ain-Shams University (2011)

In

**African Studies, Dep. of Natural Resources.
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ABSTRACT

SUPPLEMENTATION OF SOME DAIRY PRODUCTS WITH SOME MICROELEMENTS FOR IMPROVING ITS NUTRITIONAL VALUE IN EGYPT AND ETHIOPIA.

The present study concerned with three parts. **Firstly:** silicon concentration in milk from different species (buffalo, cow, camel and goat) and some dairy products (skim milk: fresh & powder, soft and processed cheese, and yoghurt) were evaluated.

Silicon concentration was analyzed by using microwave plasma atomic emission spectrometry. The results revealed the linearity and high recovery of method for milk and cheese. The lowest concentration of silicon was observed in buffalo milk (0.20 ppm) and the highest concentration was in camel milk (3.34 ppm). The values of silicon in fresh and dry skim milk were 0.80 and 33.11ppm respectively. Also, the silicon concentration in processed cheese was higher than that in soft cheese. Whilst the yoghurt was the highest in silicon compared to fresh milk and cheeses.

Secondly: Fortification of stirred yoghurt with some microelements and natural antioxidants to improve its nutritional value. The control was stirred yoghurt. Stirred yoghurt fortified with 5 % oats and some fruits (mango, banana and strawberry jam) were prepared and their impacts on physicochemical properties and some microelements (Si, Fe, Mn, Zn and Cu) content of resultants products were investigated.

The data revealed that addition of oats slight increased pH value and it decreased with fruit addition. Also the lower in protein content was lower fat while the higher in fat, fiber and carbohydrate contents were higher than control.

Mineral analyses showed that Si, Mn, and Fe contents were great difference between all treatments as they ranged between: (28.70-36.50) for Si, (4.60-5.25) for Mn, (3.50 – 4.10) for Fe and (3.30-3.60) for Zn ppm. Concerning the control, the values obtained were: (14.70), (0.90), (0.70), (3.60) for Si, Mn, Fe and Zn respectively. The sensory evaluation showed that addition of fruits improved the total acceptability.

Thirdly: Impact of fortified stirred yoghurt with oats and mango on preventing osteoporoses Ovariectomy (OVX) rats were investigated. The results of the biochemical parameters of rats, as influenced by OVX and the oral administration of nature (A) and fortified stirred yoghurt with oats or calcium silicate and mango (B,C) after five weeks showed that there was an increasing BMD for all groups.

Also, ALP decreased in OVX rat's serum with and without Fosamax. It concluded that fortified stirred yoghurt (A, B, C) may be contributed in preventing osteoporosis disease. While fortified stirred yoghurt (B) and (C) enhanced the results with the best result in treatment (B).

Key words: microelements, fortification, milk, cheese, samples, oats, stirred yoghurt, chemical, sensory properties, Wister rats, ovariectomy, osteoporoses.

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