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بسم اللّه الرحمن الرحيم

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التوثيق الالكتروني والميكروفيلم

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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بالرسالة صفحات

لم ترد بالأصل

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BIOCHEMICAL STUDIES ON SOME NUTRITIONAL ASPECTS

B17048

By

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B.Sc. Agric., (Biochemistry), Ain Shams University,(1995)

A thesis Submitted in partial fulfillment of
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IN
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To
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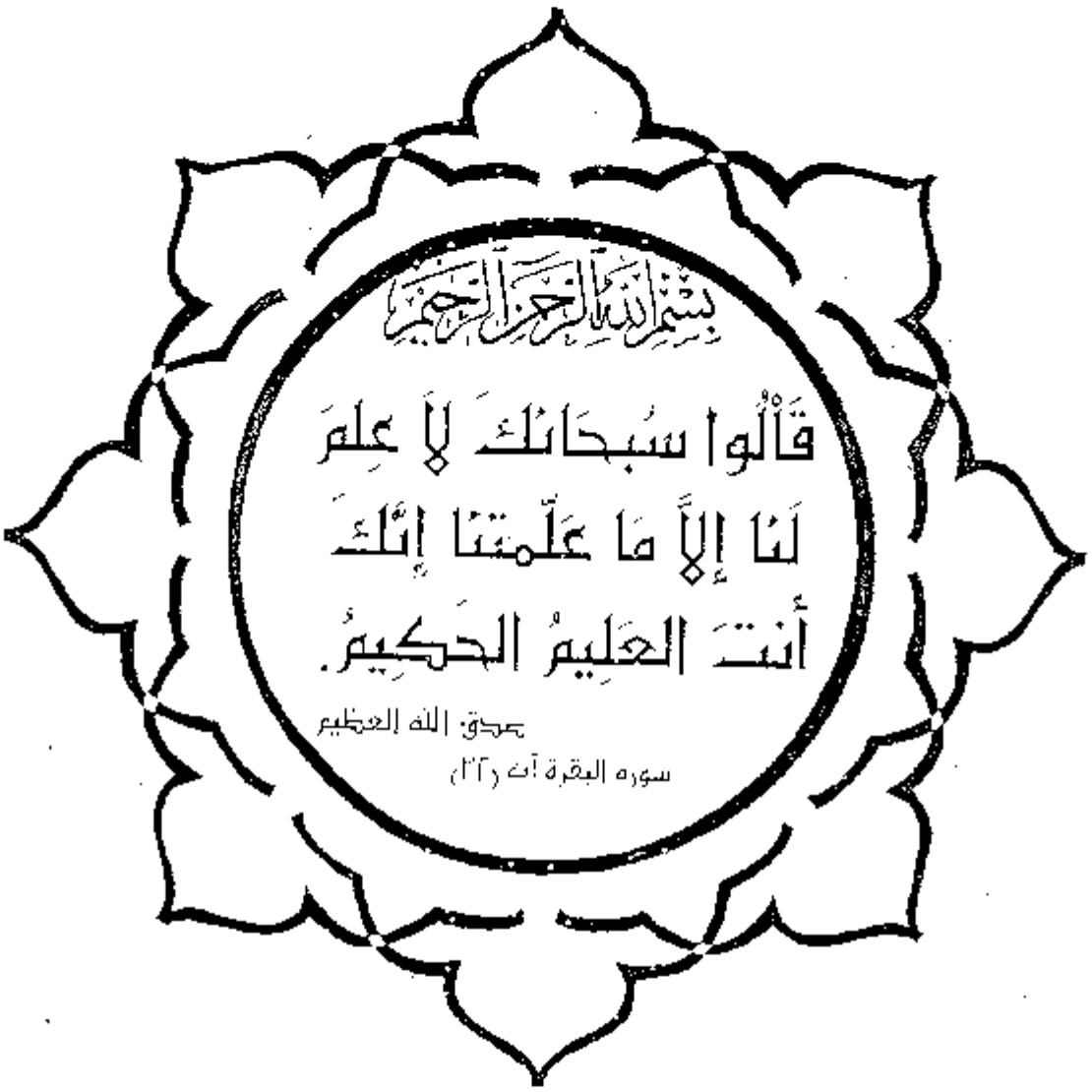
بسم الله الرحمن الرحيم
قَالُوا سُبْحَانَكَ لَا عِلْمَ
لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ
أَنْتَ الْعَلِيمُ الْحَكِيمُ.
صدق الله العظيم
سوره البقرة آيه (٣٢)

BIOCHEMICAL STUDIES ON SOME NUTRITIONAL ASPECTS

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ABSTRACT

A mixture of sucrose fatty acid polyesters (SPE) were synthesized and then it was used as a hypocholesterolemic agent for normal and hypercholesterolemic rats. Forty eight male albino rats weighting 80-90g. divided into normal and hypercholesterolemic rats continued to eat the normal and hypercholesterolemic diet respectively containing 0.0% SPE + 8% sheep tail fat (STF) , 2% SPE + 6% STF , 4% SPE + 4% STF , 6% SPE + 2% STF ,8% SPE + 0.0% STF, 0.0% SPE + 0.0 % STF for thirty days .Body weight were recorded weekly and blood samples were collected every ten days from eye plexuses vein . Total cholesterol, high density lipoprotein – cholesterol (HDL) , low density lipoprotein – cholesterol (LDL), triglycerides, total lipids, Vitamin A and E were measured in serum of normal and hypercholesterolemic rats.

The body weight of control rats were not significantly decreased but substitution of 6% and 8% of lipid fraction with SPE significantly decreased the body weights . total serum cholestrol levels in normal and hypercholesterolemic rats were significantly decreased gradually by increasing the concentration of SPE in the diet as well as increasing the feeding time on SPE . No significant variations in serum HDL – cholesterol levels of normal and hypercholesterolemic rats fed different levels of SPE. Serum LDL – cholesterol levels in normal and hypercholesterolemic rats significantly decreased gradually by increasing the concentration of SPE in the diet and by increasing the time of the feeding on SPE. The concentration of triglycerides in serum was not statistically changed by addition of SPE to diet of normal and hypercholesterolemic rats . Total lipids in serum were significantly decreased by increasing the SPE content in diets and increasing the time of feeding on SPE. In both normal and hypercholesterolemic rats, the serum vitamin A and α-tocopherol levels were gradually decreased by increasing the dietary SPE.

From the above mentioned results it could be recommended that the SPE derivative can be added to the diets of obis people as well as to the persons suffering from hypercholesterolemia .

Key Words : Olestra , Sucrose fatty acid polyesters , hypocholesterolemic agent , serum lipid profile, Vit. A, E

S.A. Ismail

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Contents

Introduction

Dietary fats and oils contribute approximately 38 % of the total calories consumed. Recommendations to the consumers suggest reduction of fat and oil consumption to 30 % or less of total calories. Excessive intake of fat in the diet has been linked to certain diseases, such as heart and circulation diseases in addition to cancer and obesity (**Akoh and Swanson , 1994 and Nestle , 1998**).

Carbohydrate and alkyl glycoside fatty acid polyesters have functional and physical properties resembling conventional triglycerides without contributing much, if any, calories to the diet (**Siigur *et al.*, 1996**). These polyesters can be added into food products for modifying the functional properties, of frying fats and oils (**Peters *et al.*, 1997**). The most studies of the carbohydrate- based fatty acid polyesters are sucrose polyesters (olestra), sorbitol polyesters, and raffinose polyesters followed by alkyl glycoside-based fatty acid polyesters (**Shieh *et al.*, 1996**) .

Procter and Gamble company, which acquired the original patent on olestra in 1971, have spent over $ 180 million over 20 years to develop this fat substitute and are currently seeking an extension of patent from the U. S. congress. Approval for use of olestra as a food additive was filed with the **Food Drug Administration** (FDA) in April 1983 by their company (**Akoh and Swanson , 1994**) .

Free sucrose has eight hydroxyl groups available for estrification. Olestra, manufactured by the Procter and Gamble company, is the common name for the mixture of hexa-, hepta-, and octaesters formed by the chemical reaction of sucrose and long-chain fatty acid methyl esters from edible oils.

LITERATURE REVIEW