شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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Biochemical studies on some factors affected on bioavailability of carotene and vitamin A in some Egyptian foods in experimental animals

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THESIS

Submitted in partial fulfillment of the Requirements for the degree of

DOCTOR OF PHILOSOPHY

IN

Agriculture Biochemistry

Department of Biochemistry

Faculty of Agriculture

Cairo University

2001

APPROVAL SHEET

Biochemical Studies on Some factors affected on bioavailability of carotene and vitamin A in some Egyptian foods in experimental animals

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Date. / /2001

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Title of Thesis Biochemical studies on some factors affected on bioavailability of carotene and vitamin A in some Egyptian foods in experimental animals

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Department : Biochemistry

Branch : Biochemistry **Approval**

ABSTRACT

Some factors such as iron, zinc, ratio of animal protein, ratio of plant protein and sodium nitrite were affected on bioavailability of vitamin A and its precursors B-carotene. Different diets containing two levels of ferrous citrate (224 mg\ 100 g diet, 11.2mg \ 100g diet), Tow levels of zinc chloride (2.04mg \ 100g diet, 0.102mg \ 100g diet), two levels of casein (30% , 5%), two levels of soy protein (30%,5%) and two levels of sodium nitrite (4mg\kg, 2mg\kg) were prepared. Biological results showed that body weight gain, food intake, food efficiency, total protein, albumin glubuline , total lipid, total cholesterol and triglyceride . Liver function (GPT, GOT), heamoglobine and glucose are appear to significantly difference of different prepared diets also results showed that vitamin A content of serum rats fed on high ratio of protein and high content of iron had higher values. Moreover rats fed on high content of zinc and high ratio of soy protein were closed to normal control rats fed on low content of zinc, iron, casein, soy protein and two levels of nitrite had lower values relative to normal control. The highest amount of vitamin A in their liver rats fed on low control of zinc while the lowest amount in rats fed on high content of zinc. Results of rats fed on 2% dried carrot as a source of (Precursor of vitamin A) showed that the feeding on high ratio of casein, iron, soy protein, zinc and normal content of nitrite increased the levels of serum vitamin A. Rats fed on low iron, high nitrite, low zinc, soy protein and low casein decreased the levels of serum vitamin A. Liver vitamin A increased in rats fed on low zinc, iron, casein, soy protein and high content of nitrite and decreased in rats fed on high iron, zinc, casein, soy protein and normal content of nitrite.

ACKNOWLEDGEMENT

First of all, ultimate thanks are due to ALLAH
Who without his aid this work could not be done

The author wishes to express her deepest gratitude to **Prof. Dr. H. M. Salem,** Professor of Biochemistry, Faculty of Agriculture, Cairo University, **Dr. Osama Abd El-Fatah**, Associated Professor of Biochemistry, Faculty of Agriculture, Cairo University, and **Prof. Dr. N. Abdel-Hameed,** Director of Food Technology Research Institute, Agricultural Research Center for their supervision and valuable advice throughout this work, sincerest appreciation for the guidance.

Deep thanks are also, due to all colleagues and staff members of Special Food Dept., Food Technology Research Institute, ARC for their useful helps, encouragement and facilities offered which, make this work possible.

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INTRODUCTION

Introduction

Minerals and vitamins are two essential groups of nutrients that play an important role in energy production and other metabolic processes in the body. Vitamin A is a vital nutrient for cellular differentiation vision, bone growth, reproduction and integrity of the immune system **(Oslon, 1984).** It is also essential for erythropoiesis.

β-Carotene is the most abundant provitamin A in foods approximately 10-50 % of the total β -Carotene consumed is absorbed in the gastrointestinal tract and within the intestinal wall is partially converted into vitamin A.

Probably the first nutritional deficiency disease to be clearly recognized was night blindness. The ancient Egyptians as indicated in the Papyrus Ebers and later in London Medical Papyrus, recommended that Juice squeezed from cooked liver should be topically applied to the eye to cure night blindness. These writings data from 1500 B. C., but the observations probably are of much earlier origin. The Greeks, who depended heavily on Egyptian medicine, recommended both the ingestion of cooked liver as well as its topical applications as a cure for night blindness, a tradition which has persisted in many societies to this day **(Wolf, 1978).** Minerals such as iron and zinc perform vital role in the metabolism, the first is essential for the synthesis of haemoglobin and in turn for gas exchange **(Goodhart and Shils, 1983).** The other mineral is needed for protein synthesis and growth. Iron- deficiency anemia and hypovitaminosis A are two of the most prevalent nutritional problems particularly in children.

On this occasion, it is estimated that about 2,150 million people are iron deficient **(WHO, 1991)** and that this deficiency is severe enough to cause anemia in 1,200 million people globally. About 90 % of all anemia have an iron deficiency component. In the developing world nearly 1/2 of the population is iron deficient. However the industrial world is not free from it, about 11% of its population has iron deficiency.

Fortification with plant protein has received considerable attention for many years. This makes protein-enriched cookies attractive for target areas, particularly child feeding programs, the elderly and low-income groups **(Claughton and Peace, 1989).**

Soybean protein product can play an important role in providing the nutrition food consumer's demand. Soybean proteins can enhance or improve the nutritive value of finished food and can help lower production costs due to their functional properties.

Nitrite is present in food naturally, or may be present as a result of the use of fertilizers on crops or from their uses as preservatives. There have been concerns over the presence of nitrites in food as it can be metabolize to potentially carcinogenic N-nitroso compounds.

The present work aimed to evaluate the influences of iron content, zinc content, ratio of animal protein, ratio of plant protein and nitrite content on the bioavailability of vitamin A and its precursor β- carotene by studying the follows:

1- Chemical analysis of raw materials.

2- Preparation of different experimental diets.

3- Investigate the effect of feeding experimental diets {high content of zinc, low content of zinc, high content of iron, low content of iron, high ratio of casein (animal protein), low ratio of casein, high ratio of soy protein (plant protein), low ratio of soy protein, normal content of nitrite and high content of nitrite} to rats by the following parameters:

1- Biological parameters:

(Body weight gains, food consumption, and feed efficiency).

2- Biochemical analysis:

- Serum glucose, total protein, albumin, globulin, total lipid, total cholesterol and triglycerides.
- Liver function (GPT, GOT).
- Vitamin A content in serum after 12 weeks of feeding rats on a vitamin A deficiency diets.
- Vitamin A content in liver after 12 weeks of feeding rats on a vitamin A deficiency diets.