PRODUCTION OF ZINC IN NANO FORM AND ITS EFFECT ON ZINC DEFICIENT RATS

BY

SHIMAA ABDELLAH HASHEM

B.Sc. Agric. Sci. (Food Technology), Fac. Agric., Cairo Univ., 2009

THESIS

Submitted in Partial Fulfillment of the Requirements for the degree of

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SUPERVISION SHEET

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SUPERVISION COMMITTEE

Dr. SALAH EL DIN HUSSEIN ABO RAYA
Professor of Food Science, Fac. Agric., Cairo University

Dr. MAGDA IBRAHIM HASSAN
Associate Professor of Nutrition and Food Science, Fac. Agric.
Cairo University

Dr. TAHER AHMED SALAH EL DIN
Senior Researcher of Nanotechnology, Agricultural Research Center

Name of candidate: Shimaa Abdellah Hashem **Degree**: M.Sc.
Title of Thesis: Production of Zinc in Nano Form and Its Effect on Zinc Deficient Rats
Supervisors: Dr. Salah El Din Hussein Abo- Raya
Dr. Magda Ibrahim Hassan
Dr. Taher Ahmed Salah El Din
Department: Food Science **Approval**: / /

ABSTRACT

This study aimed to investigate the effect of nano and bulk zinc oxide on recovery of zinc deficient rats. After preparation of nano zinc oxide form by co-precipitation method. Forty-eight male albino rats weighed 50 ±5g were divided into 8 groups; (C1) as a negative control, (C2) as positive control. The other 6 groups were fed on low-zinc diet for 3 weeks as zinc deficiency period. In the recovery period, the previous groups were fed on different concentrations of zinc oxide in nano or bulk form (13.5, 27, 54 mg/ kg of diet) for 2 weeks as a recovery period. Feed intake, body weight changes, zinc serum levels, relative organ weight and histopathological examination for organs (liver, kidney and testes) were determined. The observed results showed that the optimum body weight, feed intake, zinc serum level, relative organ weight and lowest histopathological changes were for two groups of rats which fed on 27mg of zinc oxide/ kg diet in nano or bulk form. With respect to zinc oxide fortification, 48 male rats weighed 60-70g were divided into 8 groups ;(NC) as a negative control group, (PC) as a positive control group and the other 6 groups were fed on low- zinc diet for 5 weeks as a zinc deficiency period. In the recovery period, the reminder of rats were fed on biscuits fortified with different concentrations of zinc oxide in nano or bulk form (13.5, 27, 54 mg/ kg of diet) for 4 weeks. Feed intake, body weight changes, zinc serum levels, relative organ weight and histopathological examination for organs (liver, kidney and testes) were determined. The observed results showed that the optimum body weight, feed intake, zinc serum level, relative organ weight and lowest histopathological changes were for the groups of rats which fed on biscuits fortified with two concentrations (13.5-27 mg/ kg) of zinc oxide in nano form.

Key words: zinc deficiency, nano particles, low-zinc diet, fortification, supplementation.

DEDICATION

I dedicate this work to whom my heart felt thanks; to my mother for her prayers, to my father for his support, I would also like to dedicate this work to my beloved husband Karim, who provides me with unlimited care; support and encouragement that I need to achieve my goal and success, as well as to my helpful brother and sister for all the support they lovely offered along the period of my post graduation.

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