

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

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SUPERVISION SHEET

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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 ± 5 g 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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CONTENTS

	Page
INTRODUCTION.....	1
REVIEW OF LITERATURE.....	4
1. Nanotechnology.....	4
2. Nanoparticles.....	6
3. Properties of Nano Materials.....	7
4. Preparation methods of Nanoparticles	8
5. Synthesis of Zinc Oxide Nanoparticles.....	9
6. Advantages of Chemical Synthesis.....	12
7. Disadvantages of Chemical Synthesis of Nanoparticles.....	13
8. Characterization Techniques of Nanoparticle.....	13
9. Types of Nano materials.....	15
10. Zinc oxide.....	17
11. Chemical properties.....	18
12. Physical properties.....	18
13. Antimicrobial Properties.....	19
14. Applications of Nanotechnology and Nanoparticles.....	20
15. Zinc oxide Applications.....	20
16. Zinc in nutrition.....	23
17. Zinc metabolism.....	25
18. Zinc deficiency and diagnosis.....	26
19. Importance of zinc.....	28
20. Assessment of zinc status.....	40
21. Dietary sources and bioavailability of zinc.....	43
22. Recommended intakes for Zn.....	45
23. Zinc supplementation and fortification.....	45
MATERIALS AND METHODS.....	50
RESULTS AND DISCUSSION.....	63

CONTENTS (continued)

	Page
1. Preparation and characterization of zinc oxide nano particles.....	63
2. Effect of zinc supplementation on recovery of zinc deficient-rats.....	64
3. Effect of zinc fortification on deficient rats.....	89
SUMMARY.....	113
REFERENCES	118
ARABIC SUMMARY	

LIST OF TABLES

No.	Title	Page
1.	The current recommended dietary allowances for zinc (as mg).	45
2.	Composition of basal diet (g/100g diet).....	52
3.	The composition of salt mixture (g/kg mixture).....	52
4.	Composition of the vitamin mixture (g/kg mixture).....	53
5.	Composition of low- zinc diet (g/100g diet).....	54
6.	The composition of free zinc salt mixture (g/kg mixture).....	54
7.	Ingredients of biscuit (g/ 100 g).....	57
8.	Initial body weight, Final body weight (mean \pm S.D) and weight gain of rats in different groups under study.....	66
9.	Feed intake (mean \pm S.D) of rats for control, bulk and nano zinc oxide groups.....	67
10.	Zinc serum concentration of rats at the end of experiment.....	70
11.	Relative organ weight (mean \pm S.D) of rats fed on different forms of ZnO (bulk and nano).....	72
12.	Body weight (mean \pm S.D) of rats in different groups during deficiency and recovery periods.....	90
13.	Feed intake (mean \pm S.D) of rats for control, bulk and nano zinc oxide groups.....	91
14.	Zinc levels in serum (mean \pm S.D) of rats at the end of experiment	94
15.	Relative organ weight (mean \pm S.D)of rats fed on different forms of ZnO (bulk and nano).....	96