



جامعة الأزهر
كلية الاقتصاد المنزلى
قسم التغذية وعلوم الأطعمة

تأثير الوجبات منخفضة الدهون وبعض أنواع العصائر على فئران التجارب المصابة بأمراض الكبد المزمنة

رسالة مقدمة من الباحثة

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ماجستير فى الاقتصاد المنزلي تخصص التغذية وعلوم الأطعمة -

كلية الاقتصاد المنزلي - جامعة الأزهر (2008)

استكمالاً للحصول على درجة دكتوراه الفلسفة فى الاقتصاد المنزلى تخصص التغذية وعلوم
الأطعمة

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جامعة الأزهر

2013



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التاريخ / / 2013

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الدرجة العلمية: دكتوراة الفلسفة فى الاقتصاد المنزلى "تخصص التغذية وعلوم الأطعمة".

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تحريراً فى:

/ / 2013 م



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Effect of Low Fat Diets and Some Types of Juices on Rats Suffering from Chronic Liver Diseases

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Submitted to Nutrition and Food Science Department for
Completing The Requirement for The Doctor of Philosophy Degree in
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ABSTRACT

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The main target of this study was to investigate the effect of some fruit juices namely apple, grape and pomegranate juices with or without low fat diet on the nutritional and health status of rats suffering from chronic liver injury.

The experiment was carried out using 75 male albino rats (Sprague Dawley strain) weighing 200 ± 10 g. Animals were randomly divided into two main groups including negative control group (n=5) and CCl₄-injected group (n=70). After the induction period, the latter group was randomly divided into 14 equal groups. Of which, 7 groups were fed on basal diet only (positive control group "I") or basal diet plus either apple, grape or pomegranate juices in their two doses (2 and 4 ml), while the others were fed on low fat diet only (positive control group "II") or low fat diet plus either apple, grape or pomegranate juices in their two doses (2 and 4 ml) for 28 days. At the end of the experiment, feed intake, body weight gain, feed efficiency ratio and weights of liver, kidneys and heart/body weight (%) were calculated. Also, liver enzymes, total bilirubin, lipid profiles and kidney functions were determined in serum. Moreover, livers of sacrificed rats were histopathologically examined.

Results indicated that injection by CCl₄ resulted in a significant increase in both the activities of ALT, AST and ALP in serum and the concentrations of serum total bilirubin, uric acid, urea nitrogen and creatinine. Except for HDL-C, all studied lipids were significantly elevated. In contrast, FI, BWG and hence FER recorded a significant decrease. Histopathological examination supported these findings and revealed a marked lesion in liver tissue. Administration of apple, grape or pomegranate juices, especially when accompanied with feeding on low fat diet, led to a marked improvement in liver tissue which, in turn, resulted in a significant decline in the activities of all studied liver enzymes and the concentration of serum total bilirubin. There was also a significant decrease in the mean values of uric acid, urea nitrogen, creatinine and lipid profiles, except for HDL-C which was significantly increased. In general, the high dose (4 ml) of each juice was more efficient than the low dose (2 ml) and when compared with each other, regardless of the dose, it could be noticed that pomegranate juice was the best, followed by grape juice, while apple juice came at the end.

It could be concluded that the regular consumption of pomegranate, grape or apple juices, especially when fat was reduced in the daily meals, could be of value in helping patients suffering from chronic liver disease.

Key words: CCl₄, chronic liver disease, low fat diet, apple, grape, pomegranate, juices, rats.

ACKNOWLEDGMENT

ACKNOWLEDGMENT

First and foremost thanks are to **Allah** for helping me in achieving this work. Without the aid of **Allah**, this work couldn't be done.

I would like to express my sincere appreciation to **Prof. Dr. Sohair Saeed Ahmad**, Professor in Nutrition and Food Science Dept., Faculty of Home Economics, Al- Azhar University, for her supervision, suggesting the problem of the research as well as her generous advice, valuable help and useful guidance throughout this work.

I'm grateful to **Prof. Dr. Ashraf Abd El-Aziz Abd El-Megeid**, Professor of Nutrition and Dean of Home Economics Faculty, Helwan University for his kind supervision, permanent encouragement, generous advices and great help throughout this study.

I would like to express my deep thanks and gratitude to **Dr. Samah Ahmed Ahmed El-Hashash**, Lecturer in Nutrition and Food Science Dept., Faculty of Home Economics, Al- Azhar University, for her real supervision, continuous encouragement, support, cooperation and great help until the end of the work.

My deep thanks and grateful acknowledgement is expanded to **Prof. Dr. Wafaa Abo-Halema**, Dean of Home Economics Faculty, Al – Azhar University and all staff members especially in Nutrition and Food Science Dept. for their co-operation and assistance.

Last but not least, sincere appreciation is extended to my family especially my father, mother, brothers, sisters , my husband and my beloved son mahmoud for their continuous support along the time I took to achieve this work.

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