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Effect of diets fortificated with some antioxidants and certain biological materials on the experimental rats immune system

Thesis
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بسم الله الرحمن الرحيم

"قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم"

صدق الله العظيم

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List of Abbreviations

Ab	:Antibody.
ABTS	:Azino- 3-ethyl-benzthiazoline sulfate.
AD	:Anno Domini.
ADCC	:Antibody-dependent cellular cytotoxicity.
AIDS	:Acquired Immune Deficiency Syndrome.
ALK	:Alkaline phosphatase.
ALT	:Alanine aminotransferase.
AST	:Aspartate aminotransferase.
ARMD	:Age-related macular degeneration.
BHA	:Butylated hydroxyanisole.
BHT	:Butylated hydroxytoluene.
BUN	:Blood Urea Nitrogen.
BWg	:Body weight gain.
CHD	:Coronary heart disease.
Con A	:Concanavalin A.
CU	:Copper.
CVD	:Cardiovascular disease.
DNA	:Deoxyribonucleic acid.
DTH	:Delayed-type hypersensitivity.
EDTA	:Ethylene diamine tetra acetic acid.
EE	:Ethanol extracts.
ELISA	:Enzyme-linked immunosorbent assay.
ETAS	:Electrothermal absorption spectrometry.
FER	:Food efficiency ratio.
GI	:Gastrointestinal.

HA	:high phenolic content.
H_2O_2	:Hydrogen peroxide.
Hb	:Hemoglobin.
HCT	:Hematocrit.
HIV	:Human immune deficiency Virus.
hu PBL	:human Peripheral blood lymphocytes.
IgA	:Immunoglobulin A.
IgE	:Immunoglobulin E.
IgG	:Immunoglobulin G.
IgM	:Immunoglobulin M.
IL-1	:Inter leukin-1.
INF	:Interferon-γ.
IU	:International unit.
KLH	:Keyhole-limpet hemocyanin.
LA	:Lower phenolic content
LBW	:Live body weight.
LDL	:Low density lipoprotein.
MCH.	:Mean Cell Hemoglobin.
MCHC.	:Mean Cell Hemoglobin Concentration.
MCV.	:Mean Cell Volume .
MDA	:Malondialdehyde.
MLC	:Mixed lymphocyte cultures.
MLN	:Mesenteric lymph node.
MM6	MonoMac-6.
MPV	:Mean Platelet volume.
NAIDS	:Nutritionally Acquired Immune Deficiency Syndrome.
NF	:Nuclear factor.

NK	:Natural Killer.
NO	:Nitric oxide.
O_2	:Oxygen.
O_2	:Superoxide.
OM	:Ovomucoid.
ORAC	:Oxygen radical absorbance capacity.
PBMC	:Peripheral blood mononuclear cells.
PCV	:Packed cell volume.
PDW	:Platelets Distribution width.
PEM	:Protein-energy malnutrition
PHA	:Phytohemagglutinin
PLT	:Platelets.
PMNs	:Polymorphonuclear neutrophil leukocytes.
ppm	:Part per million.
PS	:Polysaccharide.
PUFA	:Polyunsaturated fatty acid.
PWM	:Pokeweed mitogen.
RBC	:Red blood cell.
RDA	:Recommended dietary allowances.
RDW	:Red blood cell Distribution width.
SCID	:Severe combined immunodeficient.
Se	:Selenium.
SRBCs	:Sheep red blood cells.
SRRS	:Social Readjustment Rating Scale.
T.A.	:Total Albumin.
TBA	:Thiobarbeturic acid.
TBARS	:Thiobarbeturic acid reactant substances
TE	:Trace elements.

TH1	:T- Helper cell Type 1.
TH2	:T- Helper cell Type 2.
TNF	:Tumor necrosis factor.
T.P.	:Total Protein.
TT	:Tetanus toxoid.
vLDL	:Very Low density lipoprotein.
VO	:Volatile oil
WBC	:White blood cell.
Zn	: Zinc.

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ABSTRACT

The present work aimed to investigate the effect of some natural antioxidants (Vit. E, Vit. A, Vit. C and Folic Acid also Copper, Zinc and Selenium) and some special foods (Yogurt, Nigella sativa, Honey and Apple peel) on increasing the efficiency of the immune system or reactivity of experimental animals. 60 Rats were divided into ten groups, each group included 6 rats, the experimental ten groups were divided into two main experiments, experiment I: rats were fed on basal diet only (Co.+) or basal diet + the four prepared food additives groups (1-4). After 6 weeks, the animals were subjected for stress treatment and the analysis was carried out to evaluate the effect of food supplements on immune status (as curative effect).

In experiment Π {group (Co.-) and groups 5-8} the trend used was as in the first experiment but the immune suppression (stress) was preceded just after the adaptation period and before supplemented feeding. The analysis of the parameters was preceded each two weeks. Diet mixtures were as follows: 1- (Honey + Yogurt + Apple peel). 2- (Yogurt+ Nigella sativa +Honey). 3- (Zinc +Selenium + Vit. C + Copper +Yogurt). 4- (Vit. E + Vit. A +Folic Acid + Honey + Nigella sativa). Ratios of the components were as follows: (/Kg diet): V. (A) (30000 IU), V. (E) (120 mg), V. (C) (600 mg), Folic acid (500 mg), Se (15 mg), Zn (120 mg), Cu (400 mg), Yogurt (150 g), Nigella Sativa (12 g), Honey (100 g), Apple peel (75g). Biological results showed that all groups recorded significant increases in body weight in the experimental period; groups 4 and 8 recorded the highest increases in body weight. All groups recorded significant increases in body weight gain when compared with control groups in the experimental period; groups 3, 7 and 8 recorded the highest increases in body weight gain. groups 4 and 8 recorded the highest increases in food intake. Groups 5 and 7 recorded the highest increase in food efficiency. All groups recorded significant increases in relative spleen weight, the highest increase was in groups 4 and 8. All groups recorded significant decrease in red blood count when compared with control group; groups 1, 2, 6 and 7 recorded the lowest count in red blood cell. All groups recorded significant decrease in hemoglobin value and hematocrite concentration when compared with the control groups, the lowest decreases were noticed in groups 2 and 6 in hematocrite concentration. All groups recorded decreases in MCH, MCHC, RDW, PLT and PDW. All groups recorded decrease in percentage of lymphocytes, whereas all groups recorded increases in granyolocyte and monocytes. All groups recorded decrease in level of urea, creatinine and BUN, the lowest decreases were detected in groups 3 and 8 when compared with control. Groups 1 and 2 recorded decrease in ALK, ALT and AST in experiment I, whereas, groups 5 and 8 recorded decrease in AST, ALT and ALK in experiment Π. Groups 3 and 4 recorded increase in total protein, Albumin and globulin when compared with control group, whereas, groups 7 and 8 recorded insignificant decrease in total protein, albumin and globulin. All groups recorded increases in IgG when compared with control group. Groups 4 and 8 recorded significant increase in MDA when compared with the control groups. The best values to improve histopathological examinations in spleen rats were observed with groups 3 and 4. Whereas the insignificant improve in histopatholigical examinations were observed in groups of experiment Π.Results of the present study recommend the high importance of honey bee, Nigella sativa, apple peel and yogurt and antioxidant either separate or combined. Vit. C and Se have important role hence they play a good role in raising the efficiency of the immune system and body protection against diseases.

Contents

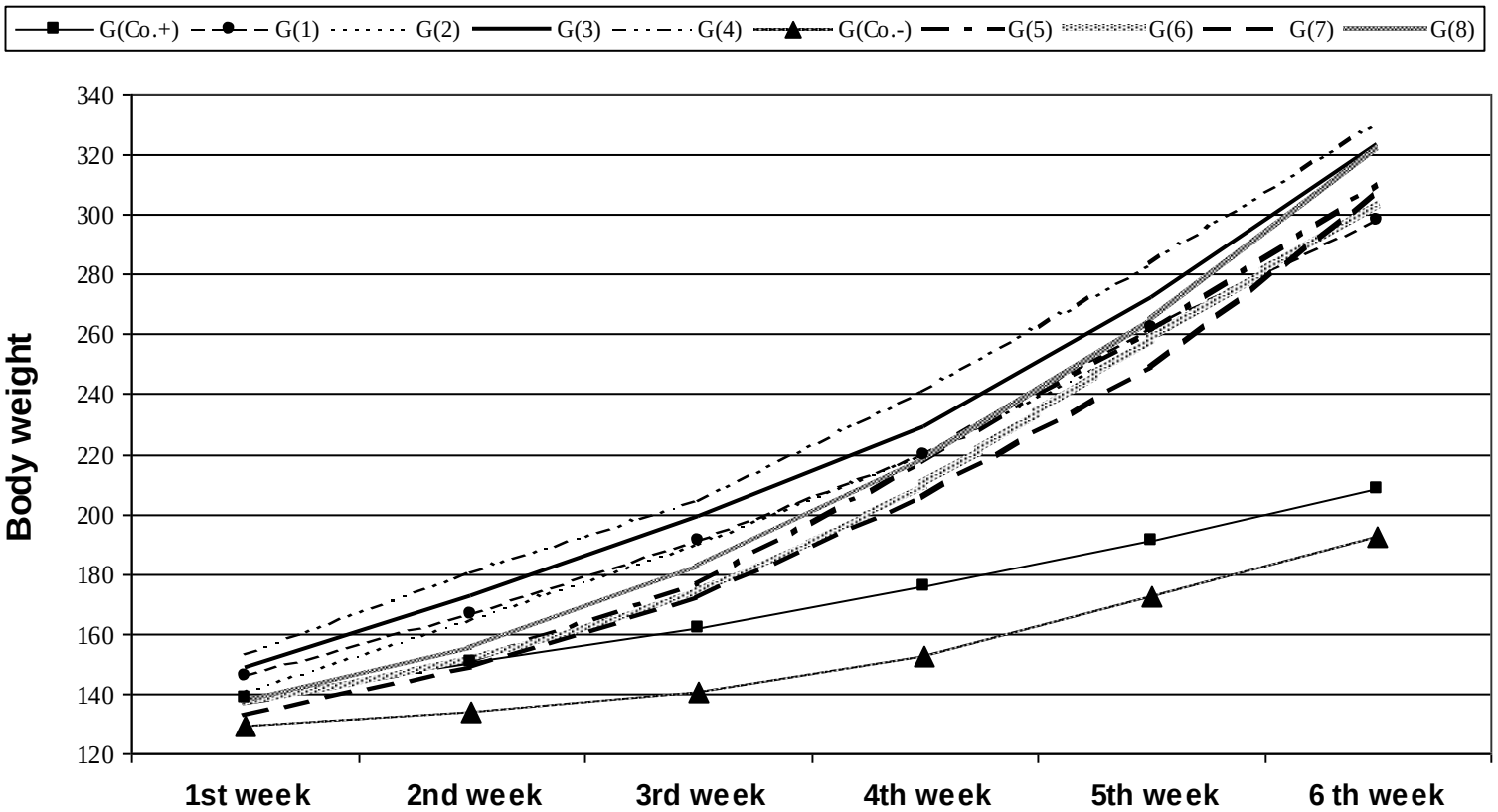
G(Co.+)
G(1)
G(2)
G(3)
G(4)
G(Co.-)
G(5)
G(6)
G(7)
G(8)
Body weight
340
320
300
280
260
240
220
200
180
160
140
120
1st week
2nd week
3rd week
4th week
5th week
6 th week

Figure (1): Body weight (g) of rats fed on different supplementations at different experimental periods.

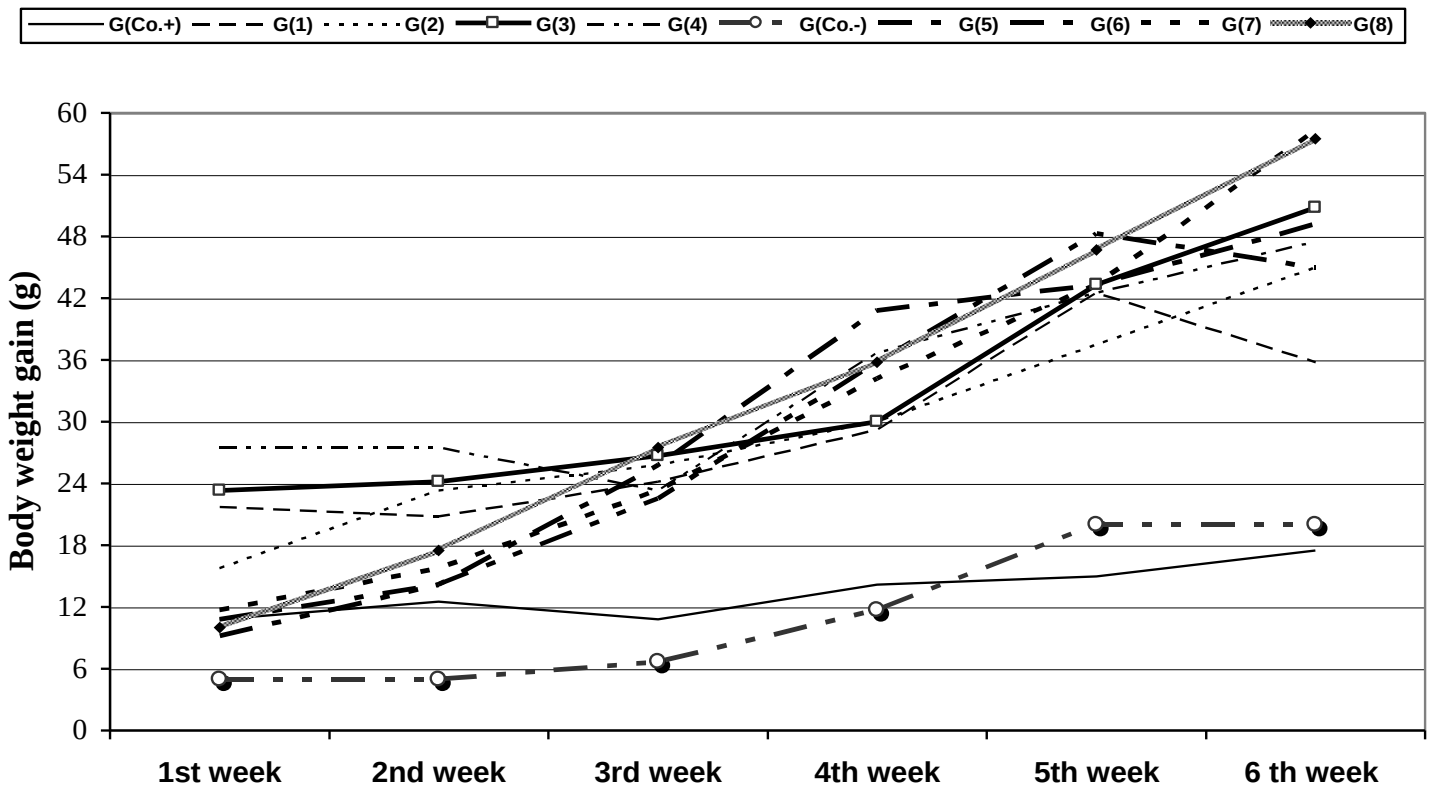

Figure (2): Body weight gain (g) of rats fed on different supplementations at different experimental periods.