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The effect of gamma irradiation on natural antioxidants and quality of fenugreek and lupine seeds in hyperlipidemic rats.

Thesis
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Amal Abdel Aziz Mansour

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List of Abbreviations

ALT	Alanine Amino Transferase
4AAP	4-Amino-Anti Pyrine
A.O.A.C.	Association of Official Analytical Chemists
AST	Aspartate amino transferase
CAT	Catalase
^{60}Co	Cobalt- 60
CE	Cholesterol Esters
CHOD	Cholesterol Oxidase
CVD	Cardiovascular Disease
DPPH	1, 1-Diphenyl-2-Picryl Hydrazyl
EDTA	Ethylene Diamine Tetracetic Acid
FER	Feed Efficiency Ratio
GK	Glycerol kinase
GPX	Glutathione Peroxidase
GPO	Glycerol Phosphate
GST	Glutathione S transferase
HDL-c	High Density Lipoprotein -Cholesterol
HP 6890	Helwett Packerd apparatus
HFHC	High-Fat High Cholesterol
IVPD	IN-vitro protein digestability
kGy	kilo Gray
LDL-c	Low Density Lipoprotein -Cholesterol
LPL	Lipoprotein Lipase
MAD	Malondialdyhyde
NCRRT	National Center for Radiation Research and Technology
NO	Nitric Oxide

NOS	Nitric Oxide Synthase
PER	Protein Efficiency Ratio
P.O	*Per Ose*
POD	peroxidase
P-value	Probability value.
RDA	Recommended Dietary Allowance
ROS	Reactive Oxygen Species
RT	Retention Time
SOD	Superoxide Dismutase

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Abstract

Abstract

The present study aims to evaluate the effect of gamma irradiation on natural antioxidants and quality of fenugreek (***Trigonella joenum-greacum***) and lupine ***(lupinus terms)*** seeds at dose levels of 10 and 20 kGy in hyperlipidemic rats. Rats were divided into: group (1) fed on balanced diet (negative control), group (2) fed on high fat high cholesterol (HFHC) diet (positive control), groups (3,4,5,6,7 and 8) fed on HFHC diet with either 15% non-irradiated or irradiated fenugreek or lupine seeds at dose levels of 10 or 20 kGy, respectively for eight weeks.

The statistical analysis of fenugreek and lupine seeds at above mentioned dose levels on its approximate analysis showed no significant differences. An exception for this general observation was fiber content of irradiated lupine seeds. The fatty acids profile of all samples exhibited certain increase in some fatty acids and decrease in others. The amino acids pattern was affected by gamma irradiation, at the applied gamma irradiation doses where some amino acids increased and others decreased. Meanwhile, statistical analysis of total phenols, flavinoides and 1, 1-diphenyl- 2 -picryl hydrazyl (DPPH) results in significant increase in all samples except for flavonoides, which showed no significantly change in 20 kGy of fenugreek seeds when compared with non-irradiated fenugreek seeds.

The biochemical performance showed that there were a significant decrease in relative liver weight except for group (3), protein efficiency ratio (PER) except for group (4), food intake, gain in body weight, serum alanine amino transferase (ALT) activity, serum aspartate amino transferase (AST) activity, total cholesterol, triacylglycerols, low density lipoprotein-cholesterol (LDL-c), liver malondialdehyde and liver nitric oxide. On the other hand, it was observed that there were a significant increase in feed efficiency ratio (FER) except for group (5), blood hemoglobin, serum high density lipoprotein-cholesterol (HDL-c), liver superoxide dismutase (SOD), liver glutathione peroxidase (GPx) and liver catalase (CAT) in groups of applied doses of non-irradiated or irradiated fenugreek or lupine seeds when compared with HFHC diet (group 2).