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قسم الإقتصاد المنزلي

دراسات بيولوجية على مضادات الأكسدة فى قشور البطاطس
(دراسة تطبيقية)

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التغذية وعلوم الأطعمة

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The present study aimed to investigate the influence of antioxidant of potato peel (*Solanum tuberosum*, L) on lowering blood lipids as a practical solution to improve the nutritional care for hyperlipidemic patients. The chemical composition of potato peel. Forty eight adult male albino rats (Sprague dawley strain) weighing between (170-180/gm). The rats were divided into 6 groups each of 8 rats. The experiment was carried out in two periods one in 3 weeks and the second in 6 weeks. In the first period, the normal (control group) was fed on basal diet, while the other five groups were fed on hyperlipidemic diet. In the second period, one group of the hyperlipidemic rats fed on hyperlipidemic diet and the other fed on with hyperlipidemic diet supplemented with four levels (5, 10, 15 and 20%) potato peel powder.

Then the animals were divided into 6 homogenous groups.

Group (1): Control group fed on standard diet.

Group (2): Untreated group fed on hyperlipidemic diet.

Group (3): Fed on hyperlipidemic diet with 5% potato peel powder.

Group (4): Fed on hyperlipidemic diet with 10% potato peel powder.

Group (5): Fed on hyperlipidemic diet with 15% potato peel powder.

Group (6): Fed on hyperlipidemic diet with 20% potato peel powder.

Body weight gain and feed intake were calculated. At the end of experiment, rats were fasted overnight and anaesthetized, blood

samples were collected in dry centrifuge tube from hepatic portal vein, the organs (liver, kidney, spleen and heart) were removed and dried by filter paper then weighed, then stored at -20°C.

The measured parameters were feed intake, body weight of organs, total lipids, triglycerides, total cholesterol, HDL-LDL-cholesterol, liver function (AST, ALT and ALP) and kidney function (serum uric acid, urea, and creatinine).

Results revealed that:

- There is a significant difference ($P \leq 0.05$) between daily feed intake of normal group (G1) and untreated group (G2). But there were no significant difference between rats fed on hyperlipidemic diet (G2) and other groups fed on hyperlipidemic diet supplemented with different levels of potato peel under investigation.
- The highest value in body weight gain per day of group fed 15% dried potato peel (G5) than other groups, while the lowest value in body weight per day was found in the group of animals fed on hyperlipidemic supplemented with 5% (G3) potato peel.
- Feed efficiency ratio indicated that, rats which has been given 15% (G5) of dried potato peel had the highest efficiency in feed utilization and the highest in weight gain in 48 day experiments.
- There was no significant difference in all relative organs weight of liver, kidney, spleen and heart through out 48 days of the experiment when compared with untreated group (G2).

- Serum total lipids was highly significant difference ($P < 0.001$) between untreated group (G2) and all group of animal under investigation.

The mean values of total lipids decreased by (12.5%) G3, (19.43%) G4, (28.6%) G5 and (26.47%) G6 for groups of rat fed on hyperlipidemic diet supplemented with four levels of potato peel under investigation as compared with untreated group G2 (hyperlipidemic diet).

- Serum triglycerides was highly significant difference ($P \leq 0.001$) between untreated group (G2) an all groups of animals under investigation.
- Serum triglycerides decreased by (9.75%) of G3, (11.64%) of G4, (16.76%) of G5 and (29.5%) of G6 for groups of hyperlipidemic diet supplemented with four levels of potato peels under investigation as compared with untreated group (G2).
- Serum total cholesterol was decreased significantly ($P \leq 0.001$) for groups of animals fed on hyperlipidemic diet containing four levels of potato peel under investigation.

The results indicated that the mean values of serum total cholesterol decreased by (12.25%) of G3, (16.91%) of G4, (27.62%) of G5 and (29.28%) of G6 of groups of rats fed on hyperlipidemic diet supplemented with four levels of potato peel under investigation as compared with untreated group (G2).

- The data revealed that the highest value of HDL-cholesterol for untreated group of animals (hyperlipidemic diet) and the

difference were highly significant ($P \leq 0.001$) between untreated group of animals and rats fed on hyperlipidemic diet containing 5, 10, 15 and 20% potato peel.

The mean values of serum HDL-Cholesterol decreased by (3.77%) of G3, (14.92%) of G4, (42.87%) of G5 and (49.74%) of G6 for groups of rats fed on hyperlipidemic diet supplemented with four levels of potato peel under investigation as compared by untreated group (G2) (hyperlipidemic diet).

- The highest value of serum LDL-cholesterol was noticed in untreated group (G2) , it decreased significantly ($P \leq 0.001$) upon treatment with different levels of potato peel under investigation.

The mean values of serum LDL-cholesterol decreased by (18.52%) of G3, (30.12%) of G4, (32.93%) of G5 and (34.23%) of G6 for groups of rats fed on hyperlipidemic diets supplemented with different levels of potato peel under investigation as compared by untreated group (G2) (hyperlipidemic diet).

Effect of potato peel consumption on liver function:

- Serum AST decreased significantly ($P \leq 0.001$) upon treatment with potato peel for groups of animals fed on hyperlipidemic diet containing 5, 10, 15 and 20% potato peel as compared with untreated group.

The result indicated that, the mean serum AST decreased by (14.23%) G3, (25.33%) G4, (26.56%) G5, and (36.76%) G6 for groups of rats fed on hyperlipidemic diet supplemented with four

levels of potato peel under investigation as compared with untreated group G2.

- Serum ALT was highly significant difference ($P \leq 0.001$) between untreated groups (G2) and all other groups of animals under investigation.

The result indicated that, the mean value of serum ALT decreased by (10.57%) of G3, (19.51%) of G4, (26.08%) of G5 and (32.49%) of G6 for groups of rats fed on hyperlipidemic diet with different levels of potato peel under investigation as compared with untreated group (hyperlipidemic diet).

- Serum ALP was highly significant difference ($P \leq 0.001$) between untreated group (G2) and all groups of animals under investigation.

The result indicated that the mean value of serum ALP decreased by (15.06%) of G3, (17.28%) of G4 (29.92%) of G5 and (35.49%) of G6 for groups of rats fed on hyperlipidemic diet with different levels of potato peel under investigation as compared with untreated group (G2).

Effect of potato peel consumption on kidney function:

- Serum uric acid was highly significant difference ($P \leq 0.001$) between untreated group (G2) and other group under investigation.

The mean values of serum uric acid decreased by (29.80%) of G3, (40.02%) of G4, (67.85%) of G5 and (67.24%) of G6 for rats fed on hyperlipidemic diet supplemented with four levels of potato peel under investigation as compared with untreated group (G2).

- Serum urea was highly significant difference ($P \leq 0.001$) between untreated group (G2) and other groups under investigation. The mean values of serum urea decreased by (10.86%) of G3, (17.54%) of G4, (23.22%) of G5 and (27.84%) of G6 for rats fed on hyperlipidemic diet supplemented with different levels of potato peel under investigation.
- Serum creatinine was highly significant difference ($P \leq 0.001$) between untreated group (G2) and other groups under investigation.

The mean values of serum creatinine decreased by (15.53%) of G3, (27.65%) of G4, (45.83%) of G5 and (61.74%) of G6 for rats fed on hyperlipidemic diet supplement with different levels of potato peel under investigation as compared with untreated group (G2).

From the obtained results , it could be concluded that the bread fortified with 5,10% potato peels were generally acceptability for different persons.