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Fortification of Some Food Products with Jerusalem Artichoke (*Helianthus Tuberosus L.*) and it's Effect on Diabetic Rats

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Abstract: Diabetes mellitus was considered as becoming a global epidemic health problem. Therefore, the aim of the current study was to investigate the effect of different levels of Jerusalem artichoke Powdered (JAP) (10, 15 and 20%) for eight weeks on blood glucose, lipid profile, liver and kidney functions and antioxidant effect of diabetic rats. Thirty adult male rats were divided into 2 main groups, group (1) control group (6 rats) fed on basal diet while, group (2) twenty four rats were injected with STZ (60 mg/kg b.wt.) to induce hyperglycemia, then were divided into 4 subgroups, subgroup (1) was fed on basal diet only and served as a control positive group, while the three other subgroups were fed on a basal diet supplemented with JAP at (10, 15 and 20%). The results indicated that, the mean insulin secretion was increased with the increasing level of JAP. The more pronounced lowering effect on reducing blood glucose was observed in the groups of rats fed on JAP at the levels of 20% after 8 weeks. There were a significant ($P<0.05$) decrease in the mean values of serum TC, TG, VLDL-c and LDL-c of the group fed on JAP at the level of 15% and 20%, as compared to 10% JAP. Addition of JAP at the level of 20% improved the kidney and liver functions. Feeding rats with JAP at different levels significantly decreased the mean value of MDA but significantly ($P<0.05$) increased the mean value of SOD and GR comparing to control positive group. The characteristics of fortified products (cake and bread) with (10, 15, 20%) of dried Jerusalem Artichoke flour were studied. The fortified bread with Jerusalem artichoke flour (JAF) at (10 %) among all the fortified samples maintained better characteristics with regard to taste, flavor, cell uniformity, tenderness, inner crumb and general acceptability.

However, all fortified cakes with different percentage of JAF had higher scores for all characteristics as compared to control sample. It can be concluded that the administration of JAP to STZ-induced diabetic rats reduced blood glucose and lipids and improved liver and kidney functions. Therefore, JAP might be used as fortified substance for cake and bread and taken by diabetic patients to prevent and reduce diabetes and its complication.

Keywords: Jerusalem Artichoke, Diabetic rats, Glucose, Insulin, Antioxidant, Liver and Kidney functions, Lipids profile.

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