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Supplemented Bread with Barley, Flaxseed and Gum Arabic on Weight Reduction of Obese Rats Suffering from Diabetes

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ABSTRACT

The present work was conducted to study the effect of supplemented bread with two levels from "barley, flaxseeds, gum Arabic and the mix from them" on weight loss of obese rats suffering from diabetes, in addition to the chemical composition and sensory evaluation of un-supplemented and supplemented bread with their tested materials. Sixty male albino rats (Sprague Dawley strain) were divided into two main groups. The first main group (6 rats) fed on basal diet containing half amount of protein from casein and the other from control bread (non-supplemented bread), as a control negative group. The second main group (56 rats) was fed eight weeks on high fat diet (HFD) to induce obesity in rats. The rats in the second main group (obese group) injected with alloxan (150 mg alloxan/kg body weight) to induce diabetes. Obese rats which suffer from diabetes were randomly assigned to nine equal subgroups: The first subgroup fed on HFD containing half amount of protein from casein and the other from non-supplemented bread, as a control positive group (obese diabetic group). Subgroup (2 and 3): were fed on HFD containing half amount of protein from casein and the other from supplemented bread prepared from wheat and barley flour 92.5:7.5 and 85:15%, respectively. Subgroup (4 and 5): were fed on HFD containing half amount of protein from casein and the other from supplemented bread prepared from wheat and flaxseeds 92.5:7.5 and 85:15%, respectively. Subgroup (6 and 7): were fed on HFD containing half amount of protein from casein and the other from supplemented bread prepared from wheat and gum Arabic 97.5:2.5 and 95: 5%, respectively. Subgroup (8 and 9): were fed on HFD containing half amount of protein from casein and the other from supplemented bread prepared from low and high levels from the mixed of tested materials, respectively. Supplemented bread with the two levels of barley, flaxseeds,

gum Arabic and the mix from them resulted in improvement the mean value of food intake and decrease body weight gain % and the percent of liver and kidney weights / body weights, as compared to the control positive group. Serum leptin, cholesterol, triglycerides, LDL-c and VLDL-c, glucose, uric acid, urea nitrogen, creatinine, aspartate amino transferase (AST), alanine amino transferase (ALT) and alkaline phosphatase (ALP) decreased significantly ($p \leq 0.05$) in all tested groups, while HDL-c increased, as compared to the positive control group. Supplemented bread with high levels from tested materials alone or the mixture of them recorded the best results of decreasing the complications which occurs from obesity and diabetes.