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**New Applications of Gum Arabic in The Field of Nutrition  
and Food Technology.**

**By**

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## ABSTRACT

In this study, chemical composition, antioxidant activity and antibacterial activity of Gum Arabic (GA) were studied, in addition to possibility of using GA as fat replacer at four levels 5, 10, 15 and 20% for production low-fat beef burger, as well as applying Gum Arabic was used in the coating solution at different concentrations (2.5, 5, 7.5 and 10%) for extending the shelf-life and maintains the physical, chemical and sensory properties of strawberry during cold storage at 4°C for 14 days. GA was added to basal diet at 10, 15 and 20% to study the effect of GA on diabetic and hepatic rats induced by alloxan and tetrachloride carbon, respectively. Most of enzymes, some indicators of liver and kidney function were determination, in addition to histopathological examination, to investigate the effect of GA on the kidney and liver functions of diabetic and hepatic rats, and comprised with diamicon and silymarin as a medical therapy. In relation to, chemical composition revealed that, total dietary fiber was the main component which represents about 89.89% of chemical composition. GA contained a high amount of phenolic compounds (1449.35 mg/100g), these compounds has effect antioxidant activity and antimicrobial activity, and the main ingredients were catchain, epicatchain, gallic acid, perogallol, vanilic acid and salysallic acid. Aqueous extract and ethanolic extract of GA appeared a high antioxidant activity which represents 73.30 and 70.87%, respectively, and high antibacterial activity against Gram positive and negative bacteria. The chemical composition of beef burger produced by replacing fat content with GA revealed that, protein and dietary fiber contents were increased with increasing replacement level, while fat content was decreased. The replacing fat content with GA improved the physical properties of low fat beef burger produced by increasing cooking yield and decreased cooking loss, shrinkage and diameter reduction. Cooking profile and sensory evaluation of low-fat beef burger showed that replacing level 5 and 10% gave values nearest to the control sample, also replacing levels 15 and 20% gave a fair product and not bad. So we can recommend using GA as fat replacer for production low-fat products for diabetic, obesity and hypercholestermic people. GA was used as edible coating decay percent; weight loss, TSS, TTA, firmness, ascorbic acid and microbial load were improved with edible coating containing GA 5 and 7.50%. Also, sensory properties indicated that coating solutions were the same concentrations gave the best properties and indicated to extend the shelf-life and keeping the chemical and physical properties of strawberry during cold storage. In relation to diabetic and hepatic treatments, the results revealed that GA treatments (10, 15 and 20%) improved body weight, relative organs weight, serum glucose

concentration of diabetic and hepatic rats. In addition GA treatments also improved lipid profile by decrease total T.C, LDL-c and T.G and increase HDL-c. Kidney functions (creatinine and uric acid) also liver functions (GPT, GOT and albumin) were returned to the normal levels after GA treatments which were raising by alloxan or C Cl<sub>4</sub> injection. Antioxidant enzyme (CAT, SOD and GSH) were increased, while MDA was decreased after GA treatments of diabetic and hepatic rats especially with 15 and 10% GA. Finally GA can used as fat replacer for low-fat products, and as edible coating for extend the shelf-life and keeping chemical and physical properties of fruits, as well as for diabetic and hepatic treatment to improve pancreas, kidney and liver functions.

**Key words:** Gum Arabic, fat replacer, edible coating, diabetes and hepatotoxicity.

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