PROTECTIVE EFFECT OF SOME DAIRY PRODUCTS ON FATTY LIVER DISEASE

BY

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ABSTRACT

Fatty liver disease is one of the most dominant chronic liver diseases that disperses among children with different ages' and adults. Non-alcoholic fatty liver disease (NAFLD) includes a wide spectrum of liver injury stages: steatosis, steatohepatitis, fibrosis, cirrhosis and hepatocellular carcinoma. No drugs can be used to treat NAFLD; only some clinical recommendations must be followed for management of NAFLD. Functional foods including fermented dairy products provide various healthy benefits in addition to their higher nutritional value. Therefore, the current study aimed to evaluate the protective effect of fermented camel milk (FCM) on progression of NAFLD induced by a high fat diet and high fructose syrup (HFDHFr) in rats. The present study included evaluation the effect of microencapsulation of some probiotic strains combined with or without plant extract on their viability under simulated gastrointestinal conditions (SGC) as well as the properties of the resultant FCM during storage at 4°C for 21 days. In addition to, evaluate the effect of the resultant FCM on different biochemical markers of rats' serum that feeding on HFDHFr, as well as histological examination. Results indicated that maximum probiotic counts were observed in the presence of 10% of beetroot extract or 1% ginger extract in comparison to other concentrations. The highest survival rates were found in chitosan-coated beads after exposure to SGC. Significant differences were found concerning probiotic counts of different FCM. Regarding to the sensory evaluation, FCM containing microencapsulated probiotic with beetroot extract was the most favorable among all treatments. Moreover, oral administration of FCM containing microencapsulated probiotics with or without plant extract lowered liver enzymes, proinflammatory cytokines and oxidative stress markers as well as enhanced insulin sensitivity, lipid profile and antioxidants parameters in serum rats. Histopathological examination showed that the group that was given FCM containing microencapsulated probiotic with beetroot extract was the nearest to negative control group followed by the group of FCM containing microencapsulated probiotic with ginger extract. In contrast, oral administration of FCM containing microencapsulated probiotic with plant extract either beetroot or ginger showed markedly amelioration of NAFLD compared to HFDHFr group.

Key Words: Microencapsulated probiotic, synbiotic, Ginger extract, Beetroot extract, Fermented camel milk, Fatty liver disease.

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LIST OF ABBREVIATIONS

NAFLD	Nonalcoholic Fatty Liver Disease
BAE	Beetroot Aqueous Extract
GAE	Ginger Aqueous Extract
HFDHFr	High Fat Diet High Fructose Syrup
TNF-α	Tumor Necrosis Factor-α
NO	Nitric Oxide
IR	Insulin Resistance
TC	Total Cholesterol
TG	Total Triglycerides
HDL	High Density Lipoprotein
LDL	Low Density Lipoprotein
VLDL	Very Low Density Lipoprotein
ALT	Alanine Aminotransferase
AST	Aspartate Aminotransferase
MDA	Malondialdehyde
GSH	Reduced Glutathione
GSSG	Oxidized Glutathione