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Improving gut function as an anti-diabetic mechanism of *Lactobacillus rhamnosus* NCDC 17

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Type IIdiabetes is a metabolic disease which is tuned by diet. Therefore, it makes sense to explore the different dietary constituents that may have positive effect on diabetes. Male albino wistar rats were fed on high fat diet (HFD, 35%) for three weeks and after that injected with streptozotocin (STZ, 35 mg/kg) intraperitoneally. Then after three days, rats having fasting blood glucose (FBG) >300 mg/dl were divided into groups: HFD+skim milk (HFD+SM); HFD+milk fermented with *Lactobacillus rhamnosus* GG (HFD+LGG); HFD+milk fermented with *L. rhamnosus* NCDC 17 (HFD+17), and fed for another 6 weeks. There was no loss in body weight due to STZ in HFD+17 group but substantial loss was observed in HFD+SM and HFD+LGG groups, yet this difference was not statistically significant. HFD+17 group had improved OGTT, lower FBG, GHb, FFAs, triglycerides, total cholesterol, LDL-cholesterol and atherogenic index, and higher plasma insulin and HDL-cholesterol in comparison to HFD+SM and HFD+LGG groups. Even though the total number of bacteria was same, HFD+17 had more *bifidobacteria* and lactobacilli in caecal contents in comparison to HFD+LGG. Relative propionate proportions (%) in caecal contents were significantly lower in case of HFD+17 then HFD+SM and HFD+LGG groups. HFD+17 showed increased expression of proglucagon and PC1 genes in cecum and decreased expression of TNF-α and IL-6 genes in epididymal fat in comparison to HFD+SM and HFD+LGG groups. We conclude that *L. rhamnosus* NCDC 17 has anti-diabetic effect in HFD fed and STZ treated rats, and this effect was achieved by improvement of gut function.

Biography

Satvinder Singh has completed his Ph.D. (Animal Biochemistry) in July 2012 at the age of 28 years from National Dairy Research Institute (NDRI), Karnal, Haryana, India. He is a B.Sc and M.Sc. in Biochemistry from Kurukshetra University, Kurukshetra, Haryana, India. He is currently a Research Associate in the Dairy Microbiology Division, NDRI. His area of research is on functional food components, prebiotics, probiotics and synbiotics for gut health, and molecular mechanism of their effects in relation to obesity, Type II diabetes and low grade inflammation.

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