Probiotics strains *L. rhamnosus* LA68 and *L. plantarum* WCFS1 improve hyper cholesterolemia and hepatic steatosis in mice with diet-induced non-alcoholic fatty liver disease

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**Objective:** In this study, two Lactobacillus strains *L. rhamnosus* LA68 and *L. plantarum* WCFS1 were evaluated for their beneficial effects on high fat diet-induced induced pathology in mice.

**Methods:** C57BL/6 Male mice were fed with high fat diet and given fructose solution to drink for a period of one month after which received active probiotic supplementation via oral gavage four times per week for the duration of three months, while on the same diet. Both metabolic and immunological parameters were analyzed.

**Results:** The supplementation with both strains had beneficial effects on mouse weight, cholesterol, HDL and LDL levels, as well as on liver tissue pathology. Weight of the animals was significantly lower in both groups with probiotic supplementation. Only the supplementation with LA68 lead to a significant lowering of cholesterol, and HDL levels compared to the untreated animals. Leptin and adiponectin levels were increased in all experimental groups to a different extent and insulin levels showed no difference between groups. Supplementation with *L. plantarum* had a lowering effect on IL-6 production and cell proliferation. All experimental groups fed with high fat diet had increased CD4⁺ cell count, while again only supplementation with *L. plantarum* led to an increase of CD8⁺ cells and a decrease of CD25⁺ cells. Both strains reduced hepatic fat accumulation, as evidenced by histological examination.

**Conclusion:** Active supplementation with both Lactobacillus strains has a positive effect on high fat diet induced pathology but the effects were different between the strains.

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