

## FULL ABSTRACT

Enhancement of phagocytic activity and nitric oxide production of peritoneal macrophage of Sprague Dawley rats fed with *Lactobacillus plantarum* Mut7 and sweet potato fiber

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**Background:** Macrophages play an important role as part of the innate immune response in the gut and they represent one of the first lines of nonspecific defense against bacterial invasion. Previous studies indicated that probiotics and prebiotics may act as immunomodulator agents. Nevertheless, research on the immunomodulatory effect of local materials has never been performed.

**Objective:** To study the effects of *Lactobacillus plantarum* Mut7 and sweet potato fiber on the activity and Nitric Oxide (NO) production of peritoneal macrophages of Sprague Dawley rats.

**Method:** Ninety six Sprague Dawley rats aged 8 weeks were divided into two groups; A (not infected with *Salmonella typhimurium*) and B (infected with *S. typhimurium*). Each group was divided into 4 subgroups and assigned to standard AIN-93M diet (KON), 10<sup>9</sup> CFU/ml of *L. plantarum* Mut7 (PRO), modified AIN-93M diet with sweet potato fiber (PRE), and both component (SIN). After 3 weeks of treatment, 6 rats of each subgroup were sacrificed and the peritoneal macrophages were isolated and analyzed for its activity and NO production. The rest of the rats continued the treatments for another 2 weeks. At the end of the experiment, they were sacrificed and the peritoneal macrophage were isolated and analyzed for its activity and NO production.

**Results:** Oral administration of *L. plantarum* Mut7, sweet potato fiber, or both improve phagocytic activity of peritoneal macrophage which was indicated by an increase in the percentage of macrophages that phagocyte latex particles ( $p < 0.05$ ) and an increase in the number of latex particles engulfed by macrophages either after 3 or 5 weeks of treatment ( $p < 0.05$ ). Oral administration of *L. plantarum* Mut7, sweet potato fiber, or both were unable to increase the nitric oxide production after 3 weeks of treatment ( $p > 0.05$ ), but after 5 weeks of treatment the production of NO was significantly increased ( $p < 0.05$ ).

**Conclusion:** *L. plantarum* Mut7, sweet potato fiber, or both increase the non-specific immune response as they could improve the activity and NO production of peritoneal macrophages.

**Keywords:** *L. plantarum* Mut7, sweet potato fiber, peritoneal macrophage, nitric oxide