

Influence of DFA III + *R. productus* AHU1760 on rat intestinal environment.

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In colon, limited *Clostridium* species have been reported to participate in the biotransformation of primary to secondary bile acids through 7 α -dehydroxylation reaction. Deoxycholic (DCA) and lithocholic acid (LCA) are known as carcinogenic promoters, can be produced through the reaction, and thus threat the health of an intestinal environment to increase risk of colon cancer. However, it is reported that, 7 α -dehydroxylation reaction occurs at the optimum pH of 7-8, and it is inhibited at the pH below 6.5. Previous study in our laboratory has found that, the administration of DFA III (Difructose anhydride III (di-D-fructofuranose-1,2':2,3'-dianhydride) together with freeze dried *R. productus* AHU1760, lowered pH (< 6.5) due to an increase of short-chain fatty acids (SCFAs) production in rat's cecum. However, the amount of organic and bile acids tends to vary in each experiment even with the same diet. Difference of microflora suspected to occur due to ingestion of DFA III at different time and rat type, which might lead to the variation of these parameters.

In this study, therefore further investigation was done by using SD and DA rats, to examine the tendency of the variations. Furthermore, we examined microbiota distribution in relation to the variations in individual subjects (rats) and groups. UPLC/MS was used for analysis of bile acids.

Male Sprague-Dawley/DA rat, 4 weeks old, were divided into several groups and fed with Control basal diet, 3%DFA III + *R. productus* AHU1760, 3% DFA III and FOS + *B. breve* JCM 1192 as comparative diet. After two weeks of test period, cecal contents were collected for analysis of pH, organic acids and microflora distribution. Fecal samples were also collected for the examination of bile acids composition and the ratio of secondary bile acids.

Results in both types of rats fed DFA III, revealed the decrease of pH of cecum contents, which was caused by the significant increase of SCFAs. Decrease of secondary bile acids and increase of primary bile acids in fecal samples was also observed, which are promising effect to the health of an intestinal environment, therefore marks DFA III as a good prebiotic candidate. Moreover, high amount of succinic acid was observed in both types of rats, which might be caused by the slow rate of its absorption, which led to its accumulation in the colon.