

***In vitro* prebiotic activity and dietary fiber content of fifteen different starch sources in Sri Lanka**

Sewwandi K.¹, Liyanage R.T.P.², Deen A.¹, Rathnayake I.¹, Polwattage A.S.¹, Jayawardana B.C.^{2*} and Liyanage R.¹

¹Laboratory of Nutritional Biochemistry, National Institute of Fundamental Studies, Hanthana Road, Kandy, Sri Lanka

²Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya

Prebiotics and dietary fiber are categorized under the group of functional ingredients which modulates broad range of non-communicable diseases including colorectal cancer, cardiovascular disease, diabetes, and other inflammatory diseases. Aim of the current study was to compare the prebiotic activity and dietary fiber (DF) content of fifteen different types of starch sources (wheat, white raw rice, redraw rice, kurakkan, white basmathi, red basmathi, blackgram, corn, soy, olu, kithul, chickpea, oats, atta and palmyrah) in Sri Lanka. The prebiotic effect was assessed by evaluating the proliferation ability of pure culture probiotic bacteria: *Bifidobacterium animalis* subsp. *lactis* (BB-12) and *Lactobacillus acidophilus* (LA-5) in the presence of each *in-vitro* digested sample. DF content was investigated using enzymatic gravimetric method (AOAC (2012)-991.42). Results revealed that total dietary fiber content (TDF) was significantly different ($p < 0.05$) among flour samples. Soybean showed the highest TDF content ($38.65 \pm 0.31\%$ dry matter) with the highest insoluble dietary fiber content ($32.76 \pm 0.16\%$ DM) while the lowest TDF ($2.3 \pm 0.13\%$ DM) was recorded in wheat flour. When considering about prebiotic activity, olu showed the highest significant growth enhancement ($p < 0.001$) for *Lactobacillus* (1.07×10^8 CFU/ml, 9.07 times growth enhancement compared to oats) and *B. animalis* subsp. *lactis* (7.28×10^7 CFU/ml, 2.03 times growth enhancement compared to oats). There was no correlation between dietary fiber content and prebiotic activity of studied starches. The current study revealed that olu, white basmathi and oats have higher prebiotic activity compared to the other starch sources used in this study and indicating the possibility of using them in functional food preparation.

Keywords: *Bifidobacterium*, dietary fiber, lactobacillus, prebiotic and Sri Lanka

*Corresponding author: baranaj@pdn.ac.lk