

Dwita Ratih Fitriani 2014: Antioxidant and Prebiotic Properties of Oligosaccharides Extracts from Commercially Defatted Rice Bran. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Miss Pinthip Rumpagaporn, Ph.D. 96 pages.

Utilization of by-product from rice bran oil production was studied for its antioxidant and prebiotic properties. The extracts were prepared from commercially defatted rice bran with the assistance of two commercial enzymes, Viscozyme L (endo- $\beta$ -glucanase) and Pentopan Mono BG (endo- $\beta$ -xylanase). The enzymatically treated extracts were fractionated by gradual ethanol precipitation. Three fractions, the <60%, 60-90% and >90% fractions, were obtained from each enzymatic treatment. Each fraction was determined for its phenolic content and antioxidant capacity by reducing power and DPPH radical-scavenging methods. By both methods, the highest antioxidant activity was observed in the >90% fraction of either Viscozyme or Pentopan treatment, which was in line with its phenolic content. Fractions 60-90% were selected for *in vitro* determination of prebiotic properties due to the low amount of starch, protein and sugar. The results showed that P60-90 was not significantly different with inulin in term of digestibility. Interestingly, P60-90 also showed higher capability in supporting probiotic (*Bifidobacterium breve* TISTR 2130, *B. longum* TISTR 2194, *Lactobacillus acidophilus* ATCC 4356, *L. plantarum* BCC 39798) growth with inulin. Unfortunately, compared to inulin, the growth of *Escherichia coli* TISTR 887 in this fraction was higher. It was found that the ratio of short chain fatty acid (SCFA), such as acetate, propionate and butyrate, from each culture was varied. The highest ratio of acetate production was found in the media of *L. acidophilus* ATCC 4356 with V60-90 and P60-90 as the substrates. Feeding *L. plantarum* BCC 39798 with all substrates and *B. breve* TISTR 2130 with inulin could produce the highest ratio of propionate and butyrate. V60-90 contains more unbranched arabinoxylooligosaccharides (AXOS) with lower DP, while P60-90 has more branched AXOS with DP>4 when identified by HPAEC-PAD. Viscozyme and Pentopan assistance are useful to release the phenolic compounds and oligosaccharides from commercially defatted rice bran, which have positive capability as the source of antioxidant and prebiotic.

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