

### 3.7 References

- Alarifi, S., Bell, A., and Walton, G. 2018. In vitro fermentation of gum acacia - impact on the faecal microbiota. International Journal of Food Sciences and Nutrition. 1-9.
- Al-Lahham, S.H., Peppelebosch, M.P., Roelofsen, H., Vonk, R. J., and Venema, K. 2010. Biological effects of propionic acid in humans: metabolism, potential applications and underlying mechanisms. BBA-Molecular and Cell Biology of Lipids. 1801(9): 1175-1183.
- Al-Sheraji, S. H., Ismail, A., Manap, M. Y., Mustafa, S., Yusof, R. M., and Hassan, F. A. 2013. Prebiotics as functional foods: a review. Journal of Functional Foods. 5: 1542-1553.
- Alvaro, A., Sola, R., Rosales, R., Ribalta, J., Anguera, A., Masana, L., and Vallve, J. C. 2008. Gene expression analysis of a human enterocyte cell line reveals downregulation of cholesterol biosynthesis in response to short-chain fatty acids. International Union of Biochemistry and Molecular Biology. 60: 757–764.
- Ariestanti, C. A., Seechamnarakit, V., Harmayani, E., and Wichienchot, S. 2018. Optimization on production of konjac oligo-glucomannan and their effect on the gut microbiota. Journal of Food Science and Nutrition. 7(1): 788-796.
- Bach Knudsen, K. E. 2015. Microbial degradation of whole-grain complex carbohydrates and impact on short chain fatty acid and health: a review. Advances in Nutrition an International Review Journal. 6(2): 206-213.
- Burgos-Edwards, A., Fernandez-Romero, A., Carmona, M., Thuissard-Vasallo, I., Schmeda-Hirschmann, G., and Larrosa, M. 2020. Effects of gastrointestinal digested polyphenolic enriched extract of Chilean currants (*Ribes magellanicum* and *Ribes punctatum*) on *in vitro* fecal microbiota. Food Research International. 129: 108848.



Cani, P. D. and Delzenne, N. M. 2009. The role of the gut microbiota in energy metabolism and metabolic disease. *Current Pharmaceutical Design.* 15(13): 1546-1558.

Cantu-Jungles, T. M., Ruthes, A. C., El-Hindawy, M., Moreno, R. B., Zhang, X., Cordeiro, L. M. C., Hamaker, B. R., and Iacomini, M. 2018. *In vitro* fermentation of *Cookeina speciosa* glucans stimulates the growth of the butyrogenic *Clostridium* cluster XIVa in a targeted way. *Carbohydrate Polymers.* 183: 219–229.

Chaikliang, C., Wichienchot, S., Youravoung, W., and Graidist, P. 2015. Evaluation on prebiotic properties of  $\beta$ -glucan and oligo-  $\beta$ -glucan from mushroom by human fecal microbiota in fecal batch culture. *Functional Foods in Health and Disease.* 5(11): 395-405.

Connolly, M. L., Lovegrove, J. A., and Tuohy, K. M. 2010. Konjac glucomannan hydrolysate beneficially modulates bacterial composition and activity within the faecal microbiota. *Journal of Functional Foods.* 2: 219–224.

Daims, H., Bruhl, A., Amann, R., Schleifer, K. H., and Wagner, M. 1999. The domain-specific probe EUB338 is insufficient for the detection of all bacteria: development and evaluation of a more comprehensive probe set. *Systematic and Applied Microbiology.* 22(3): 434-444.

Duncan, S. H, Barcenilla, A., Stewart, C. S., Pryde, S. E., and Flint, H. J. 2002. Acetate utilization and butyryl coenzyme A (CoA): acetate-CoA transferase in butyrate-producing bacteria from the human large intestine. *Applied and Environmental Microbiology.* 68(10): 5186-5190.

Ghoddusi, H. B., Grandison, M. A., Grandinson, A. S., and Tuohy, K. M. 2007. *In vitro* study on gas generation and prebiotic effects of some carbohydrates and their mixtures. *Anaerobe.* 13: 193-199.

Gibson, G. R., Probert, H. M., Van Loo, J., Rastall, R . A., and Ruberfroid, M. B.

2004. Dietary modulation of the human colonic microbiota: updating the concept of prebiotics. *Nutrition Research Reviews*. 17: 259-275.

Gibson, G. R., Hutkins, R., Sanders, M. E., Prescott, S. L., Reimer, R. A., Salminen, S. J., Scott, K., Stanton, C., Swanson, K. S., Cani, P. D., Verbeke, K., and Reid, G. 2017. The international scientific association for probiotics and prebiotics (ISAPP) consensus statement on the definition and scope of prebiotics: a review. *Expert Consensus Document of Gastroenterology and Hepatology*. 14: 491-502.

Harmayani, E., Aprilia, V., and Marsono, Y. 2014. Characterization of glucomannan from *Amorphophallus oncophyllus* and its prebiotic activity *in vivo*. *Carbohydrate Polymers*. 112: 475–479.

Hijova, E. and Chmelarova, A. 2007. Short chain fatty acids and colonic health: a topical review. *Bratislavské Lekárske Listy*. 108(8): 354-358.

Hugenholz, P., Tyson, G. W., and Blackall, L. L. 2002. Design and evaluation of 16S rRNA-targeted oligonucleotide probes for fluorescence *in situ* hybridization. *Method Molecular Biology*. 179: 29-42.

Kaiko, G.E. and Stappenbeck, T.S. 2014. Host-microbe interaction shaping the gastrointestinal environment: a review. *Trends Immunology*. 30(40): 1-11.

Langendijk, P. S., Schut, F., Jansen, G. J., Raangs, G. C., Kamphuis, G. R., Wilkinson, M. H. F. and Welling, G. W. 1995. Quantitative fluorescence in-situ hybridization of *Bifidobacterium* spp. with genus-specific 16s ribosomal-RNA-targeted probes and its application in fecal samples. *Applied and Environmental Microbiology*. 61: 3069-3075.

Laparra, J. M., Tako, E., Glahn, R. P., and Miller, D. D. 2008. Supplemental inulin does not enhance iron bioavailability to Caco-2 cells from milk- or soy-based, probiotic-containing, yogurts but incubation at 37 °C does. *Food Chemistry*. 109(1): 122–128.

Macfarlane, S. and Macfarlane, G. T. 2003. *Food and the large intestine*. Blackwell Publishing Ltd. 24-42.

Manz, W., Amann, R., Ludwig, W., Vancanneyt, M., and Schleifer, K. H. 1996. Application of a suite of 16S rRNA-specific oligonucleotide probes designed to investigate bacteria of the phylum cytophaga-flavobacter-bacteroides in the natural environment. *Microbiology*. 142: 1097-1106.

Marchesi, J. R., Adams, D.H., Fava, F. et al. (2016). The gut microbiota and host health: a new clinical frontier. *Gut*. 65: 330–339.

Ohashi, Y., Harada, K., Tokunaga, M., Ishihara, N., Okubo, T., Ogasawara, Y., Juneja, L. R., and Fujisawa, T. 2012. Faecal fermentation of partially hydrolyzed guar gum. *Journal of Functional Foods*. 4: 398–402.

Palframan, R., Gibson, G. R., and Rastall, R. A. 2002. Effect of pH and dose on the growth of gut bacteria on prebiotic carbohydrate *in vitro*. *Anaerobe*. 8: 287-292.

Plongbunjong, V., Grajdist, P., Knudsen, K. E. B., and Wichienchot, S. 2017. Isomaltooligosaccharide synthesised from rice starch and its prebiotic properties *in vitro*. *International Journal of Food Science and Technology*. 52: 2589–2595.

Riviere, A., Selak, M., Lantin, D., Leroy, F., and De Vuyst, L. 2016. Bifidobacteria and butyrate-producing colon bacteria: importance and strategies for their stimulation in the human gut. *Frontiers Microbiology*. 7: 979.

Russel, D. A., Rossa, R.P., Fitzgerald, G.F. and Stanton, C. 2011. Metabolic activities and propionic potential of bifidobacteria. International Journal of Food Microbiology. 149(1): 88-105.

Sonnenburg, E. D. and Sonnenburg, J. L. 2014. Starving our microbial self: the deleterious consequences of a diet deficient in microbiota accessible carbohydrate. Cell Metabolism. 20(5): 779-7786.

Sossai, P. 2012. Butyric acid: what is the future for this old substances. The European Journal of Medical Sciences. 142: 1-4.

Wang, M., Wichienchot, S., He, X., Fu, X., Huang, Q., and Zhang, B. 2019. *In vitro* colonic fermentation of dietary fibers: fermentation rate, short-chain fatty acid production and changes in microbiota: a review. Trends in Food Science and Technology. 88: 1-9.

Wichienchot, S., Prasertsan, P., Hongpattarakere, T., Gibson, G. R., and Rastall, R. A. 2016. *In vitro* fermentation of mixed linkage gluco-oligosaccharides produced by *Gluconobacter oxydans* NCIMB 4943 by the human colonic microflora. Current Issues Intestinal Microbiology. 7: 7-12.

Wichienchot, S., Prakobpran, P., Ngampanya, B., and Jaturapiree, P. 2017. Production, purification and fecal fermentation of fructooligosaccharide by FTase from Jerusalem artichoke. International Food Research Journal. 24: 134–141.

Wu, X., Wu, Y., He, L., Wu, L., Wang, X., and Liu, Z. 2018. Effects of the intestinal microbial metabolite butyrate on the development of colorectal cancer. Journal of Cancer. 9(14): 2510–2517.

Yang, J., Martínez, I., Walter, J., Keshavarzian, A., and Rose, D. J. 2013. *In vitro* characterization of the impact of selected dietary fibers on fecal microbiota composition and short chain fatty acid production. Anaerobe. 23: 74–81.



**Production of Porang Oligo-glucomannan and Its Prebiotic Activity In Vitro Fecal Batch Culture**

**Fermentation**

ANGGELA, Prof. Dr. Ir. Eni Harmayani, M.Sc.

Universitas Gadjah Mada, 2020 | Diunduh dari <http://etd.repository.ugm.ac.id/>

UNIVERSITAS  
GADJAH MADA

Yang, J., Vittori, N., Wang, W., Shi, Y. C., Hoeflinger, J. L., Miller, M. J., and Pan, Y.

2017. Molecular weight distribution and fermentation of mechanically pre-treated konjac enzymatic hydrolysates. Carbohydrate Polymer. 159: 58-65.