

Health Promotion Through the Interaction of Food and Gut Microorganisms

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Summary

Food components and its physiological functions and microorganisms and microbial functions support each other in terms of health promotion.

Microorganisms related to food functions include intestinal bacteria and microorganisms involved in fermentation and brewing. Recently, how intestinal bacteria can elicit physiological functions from food components is becoming clear. The metabolisms of intestinal bacteria induce molecules from food components that cannot be produced by the host, and these molecules create new physiological functions that have not been discovered before, as found in the examples of gut microbial metabolism of polyunsaturated fatty acids and plant-derived bioactive compounds such as glucosinolates, polyphenols, and glycosylated flavonoids. The enzyme systems involved in generating these metabolites are useful to produce bioactive metabolites of dietary components. Based on the scientific findings on these novel metabolites, enzyme systems and metabolisms, new concepts of postbiotics (gut-microbial food-component metabolites) as novel health promoting tools and precision nutrition applying the gene information of novel enzyme systems for evaluating personal gut microbial function were proposed. The same microbial metabolic function are also found in fermentation processes such as in natto fermentation. These metabolites produced from food components by gut bacteria and fermentation microorganisms have potential as materials for functional foods.