Guidance for substantiating the evidence for beneficial effects of probiotics: Results from the ILSI probiotic task force.

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For probiotics in general, a substantial of potential beneficial health effects have been suggested. There is, however, general agreement that health benefits are strain specific and only certain strains may have selected health benefits. The different potential beneficial effects specific probiotic strains may possess, can be translated into different health claims. This, together with the continued strong interest within the scientific community, consumers and industry on the potential of probiotics, has caught the attention of legislators.

There is a need for comprehensive and harmonized guidelines on the assessment of the characteristics and efficacy of probiotics and of the foods containing them. However, the continued interaction between the host and his/her microbiota, and between the microbiota and incoming microbes (e.g. probiotics and pathogens) complicates this process. Within the International Life Science Institute (ILSI) Europe, an international expert group has evaluated the published evidence of the functionality of different probiotics in 4 areas of human application (1):
1) Metabolism
2) Chronic intestinal inflammatory and functional disorders
3) Infections
4) Allergy

Within these areas and based on existing evidence, concrete examples of demonstration of benefits and gaps are listed, and guidelines and recommendations are defined that should help design the next generation of probiotic studies.
Recommendations on the impact of probiotics on the digestive metabolism include proper reporting of the physiological state and metabolic activity of the tested organism, the influence of the probiotic matrix and background diet. New technologies such as metabolomics hold great promise for the study of probiotic functionality (2).

With inflammatory bowel disease two probiotic products seem to be effective in maintaining remission; in ulcerative colitis and pouchitis respectively. No probiotic has been found to be effective in Crohn's disease, to date. A further understanding of the mechanisms of the disease and probiotic functionality is there for essential. For irritable bowel syndrome, studies should be performed with sufficient length and with a wide range of well defined patients. To assess the clinical endpoints, validated psychometric or symptom severity questionnaires should be used (3).

Sufficient consistent data exist to conclude that certain probiotics, under certain conditions, and in certain target populations, probiotics are beneficial in reducing the risk of infection. Future studies are recommended to be of sufficient power and to report both clinical outcomes and immune biomarkers relating to putative underlying mechanisms. Furthermore, the pathogens involved should be identified (4).

Specific probiotics appear to be most successful in the primary prevention of atopic eczema. Although a limited number of studies also provided evidence for a beneficial effect of different probiotics in the management of allergic diseases. However, the choice of probiotic strains as well as timing of the intervention is important variables.
Future studies should use uniform criteria for diagnosis and symptom scoring of atopic diseases and may identify the genes predisposing to allergic disease (5)

Reference List

(1) Rijkers GT, Bengmark S, Enck P, Haller D, Herz U, Kalliomaki M, et al. Guidance for substantiating the evidence for beneficial effects of probiotics: current status and recommendations for future research. J Nutr 2010 Mar;140(3):671S-6S.

(2) Rabot S, Rafter J, Rijkers GT, Watzl B, Antoine JM. Guidance for substantiating the evidence for beneficial effects of probiotics: impact of probiotics on digestive system metabolism. J Nutr 2010 Mar;140(3):677S-89S.

(3) Haller D, Antoine JM, Bengmark S, Enck P, Rijkers GT, Lenoir-Wijnkoop I. Guidance for substantiating the evidence for beneficial effects of probiotics: probiotics in chronic inflammatory bowel disease and the functional disorder irritable bowel syndrome. J Nutr 2010 Mar;140(3):690S-7S.

(4) Wolvers D, Antoine JM, Myllyluoma E, Schrezenmeir J, Szajewska H, Rijkers GT. Guidance for substantiating the evidence for beneficial effects of probiotics: prevention and management of infections by probiotics. J Nutr 2010 Mar;140(3):698S-712S.

(5) Kalliomaki M, Antoine JM, Herz U, Rijkers GT, Wells JM, Mercenier A. Guidance for substantiating the evidence for beneficial effects of probiotics: prevention and management of allergic diseases by probiotics. J Nutr 2010 Mar;140(3):713S-21S.