

## Prebiotics Task Force

# Understanding the Prebiotics Metabolic and Health Effects



## Diet, Health and Disease

2011 Member companies:

Cargill, Clasado, Colloides Naturels International, Cosucra Groupe Warcoing, Danisco, Danone, Group Roquette, Kellogg Europe, Kraft Foods Europe, Mead Johnson Nutrition, Nestlé, Pfizer Consumer Healthcare, Puratos Group, Royal FrieslandCampina, Sensus, Südzucker/BENEIO Group, Syral, Tate & Lyle Ingredients, Unilever

### Background

Recently the area of prebiotics in nutritional sciences has attracted a high level of interest. The prebiotic effect is already a scientific fact but an in-depth understanding of their underlying mechanism is still lacking in many aspects. Recently it became clear that prebiotic, dietetic nutrition causing a selective modification in gut microbiota's composition and/or activity(ies) might induce beneficial physiological effects in the colon but also in the whole body and/or contribute towards reducing the risk of miscellaneous intestinal and systemic pathologies. Thus, gut microbiota is now perceived as a key player in well-being and health with, as a principal condition, with a composition of potentially health promoting microorganisms (especially the saccharolytic genera/species e.g. bifidobacteria) are elevated and/or more active than the potentially harmful ones (especially the proteolytic/putrefactive genera/species) introducing or maintaining normobiosis.

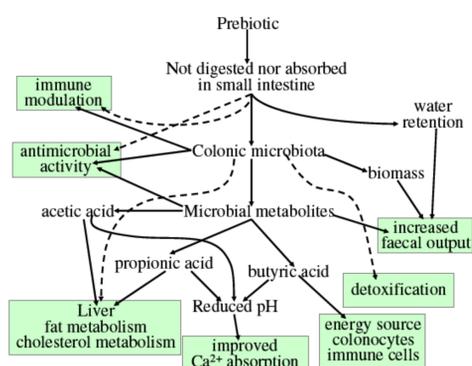
### Objectives of the Task Force

Achieve a working definition of prebiotics and gather the evidence for the physiological effects of prebiotics that have an impact on microflora and other health effects on the host, including :

- Identification of criteria for substantiation of prebiotic efficacy;
- Identification of emerging areas of health impacts of non-digestible food and feed ingredients on health benefits and/or physiological functions.

The prebiotics role on the gut functions:

Ouwehand AC, et al. (2006) Digestive Health 44-51. Part I Sweeteners and sugar alternatives in Food Technology, Edited by Helen Mitchell, Blackwell Publishing, UK.



As a result of the research activity that followed the 1st publication of the prebiotic concept 15 years ago, it has become clear that specific food products causing a selective modification in the gut microbiota's composition and/or activity and thus strengthens normobiosis could either induce beneficial physiological effects in the colon and also in extra-intestinal compartments or contribute towards reducing the risk of dysbiosis and associated intestinal and systemic pathologies.

### The prebiotic concept: a definition well defined

A group of European experts gathered the updated science explaining the prebiotic concept in a review recently published in the British Journal of Nutrition\*. This concept being:

“The selective stimulation of growth and/or activity(ies) of one or a limited number of microbial genus(era)/species in the gut microbiota that confer(s) health benefits to the host”.

The main physiological and patho-physiological targets for prebiotic effects are:

- Improvement and/or stabilization of gut microbiota composition
  - Improvement of intestinal functions (stool bulking, stool regularity, stool consistency)
  - Increase in mineral absorption and improvement of bone health (bone Ca content, bone mineral density)
  - Modulation of gastro-intestinal peptides production, energy metabolism and satiety
  - Initiation (after birth) and regulation/modulation of immune functions
  - Improvement of intestinal barrier functions, reduction of metabolic endotoxemia
  - Reduction of risk of intestinal infections
- and tentatively
- Reduction of risk of obesity, type 2 diabetes, metabolic syndrome, etc.
  - Reduction of risk and/or improvement in the management of intestinal inflammation
  - Reduction of risk of colon cancer

\*M. Roberfroid et al. Prebiotic Effects: Metabolic and Health Benefits. British Journal of Nutrition 2010 104(Suppl.2):S1-S63.



### Functions contributing to gut health: Looking at the microbial fermentation and metabolism

So far the key prebiotic function focused on a shift in the microbial composition of the gut microbiota whereas the metabolic products of the microbiota were less considered. The Prebiotics Task Force is creating a new group of experts who will have a systematic approach on the scientific data on the physiological effects of microbial metabolites. They will try to answer the following:

- What is the evidence of the physiological effects of the SCFA and other compounds metabolised in the GI tract?
- Assessing the evidence of toxicity/adverse effects of certain compounds produced during the (protein) fermentation (eg. sulfides, phenolic and indolic compounds). What is the existing evidence of other available markers?
- Overall: how to link changes of microbial fermentation and metabolism to specific targets and physiological effects based on systematic topic-wise reviews. Achievement shall be a documentation about the evidence of markers for demonstrating possible health effects with dietary modulations such as prebiotics

The expected publication would then be a support to demonstrate why a shift in one/several biological markers can be considered as biological relevant for gut health.

### Other activities:

- A Concise Monograph gathering both the specificities of probiotics and prebiotics, two concepts often mixed-up by the non-expert audience will be published in 2012.
- Collaboration with ISAPP and other ILSI branches working on gut microbes and health will continue.