

FUNCTIONAL FOOD INGREDIENTS FOR GUT HEALTH: EXPLOITATION OF PLANT BIOMASS SOURCES FOR NOVEL INGREDIENTS

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Recent years have seen an increase in interest, both in the scientific community and in industry, in the development of functional foods. These are foods with specific health attributes beyond nutrition. One of the most rapidly developing sectors is foods targeted at gut health.

Traditionally, live bacterial supplements, or probiotics, have been used in this regard. A more recent concept, however, is that of prebiotics. These are non-digestible carbohydrates which are selectively fermented in the gut by specific bacterial groups which convey health benefits.

The current market in the EU is dominated by inulin, largely from chicory, and fructo-oligosaccharides derived either from inulin by hydrolysis or from sucrose by synthesis. A smaller market share is occupied by galacto-oligosaccharides derived from lactose. There are now many studies substantiating the prebiotic status of these ingredients and increasing data on the impact they have on human health.

There is, however, potential to derive functionally enhanced forms of prebiotics. Such functional enhancements may include the ability to inhibit pathogens from binding to host cells, ability to regulate the growth cycle of cells, more selective targeting at specific bacterial groups and increased persistence in the colonic environment.

A potential source of such enhanced prebiotics is plant biomass. There are many sources of plant biomass from a range of agricultural activities and food processing operations. These represent a rich resource of carbohydrate chemistry which can be exploited to manufacture novel prebiotics.

This lecture will give an overview of the prebiotic concept in human health and nutrition and then focus on the potential to derive bioactive oligosaccharides from biomass sources. Recent data will be presented from our studies on pectins and pectic oligosaccharides, and on cereal-derived oligosaccharides.