UTILISATION OF COMPLEX POLYSACCHARIDES BY LACTIC ACID BACTERIA

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Lactic acid bacteria are widely used in cultures for the production of fermented foods. In many cases these bacteria are similar or identical to those occurring in the gastrointestinal tract of man. In food systems lactic acid cultures are used to improve the texture, flavour, nutritional value and the storage life of foods. For both foods and the gastrointestinal tract, lactic acid bacteria have an important role in inhibiting growth of deleterious bacteria, preventing food spoilage in foods and the growth of pathogenic bacteria in the gastrointestinal tract. Lactic acid bacteria utilise carbohydrate as the major energy source and therefore their growth can be greatly affected by the composition of the available carbohydrate. This study sought to investigate the range of complex polysaccharides that could be metabolised by lactic acid bacteria.

Thirty two strains of lactic acid bacteria including human isolates of *Lactobacilli*, *Bifidobacteria* and *Pediococci* were tested for their ability to ferment 36 complex polysaccharides. The percentage of all the strains of any bacterial species fermenting a diverse range of carbohydrates is shown in the table.

	Lactic Acid Bacteria				
Carbohydrate	1	2	3	4	5
α cellulose	0	0	0	0	0
arabinoxylan (wheat)	38	0	0	0	0
β cyclodextrin	75	75	71	29	14
gum tragacanth	0	12	0	0	0
lupin cell wall	50	12	0	43	14
lupin hull	12	12	14	14	0
soy hull	25	0	14	0	0

1= Bifidobacteria (8); 2= Lactobacillus acidophilus (8); 3= L. casei (7); 4= L. helveticus (7); 5= Streptococcus thermophilus (7); values in parenthesis indicate the number of strains used.

There is notable variation between strains in their capacity to utilise this range of carbohydrate materials. In general *Bifidobacteria* had a greater capacity to utilise complex carbohydrates than the other species, and grew more vigorously on these energy sources. These findings have significance both in the production of fermented foods and in the use of carbohydrate sources in the diet to influence the growth of microflora in the gastrointestinal tract.

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