Growth of bifidobacteria: environmental conditions and adherence to epithelial cells

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1. Introduction

Bifidobacteria were found to be a predominant component of the intestinal flora in breast-fed infants. They contribute to digestion, immunity promotion, production of vitamins (mainly of the B group) and inhibition of pathogens. The benefits of consuming milk products containing bifidobacteria are well documented (1, 2, 3, 4, 5). Bifidobacteria have been used as probiotics in humans (6). More than 70 products mostly of dairy origin containing bifidobacteria, are produced world wide (7).

Bifidobacteria are nutritionally fastidious microorganisms that require specific growth factors as only a limited number of these bacteria can grow in minimal culture conditions (8).

The objective of this study was to investigate the effect of environmental conditions on the growth of 4 species of bifidobacteria. Adhesion of these bacteria to sheep intestinal epithelial cells was also studied.

2. Material and methods

2.1 Microorganisms

Bifidobacterium angulatum ATCC 27535 and *B. longum* ATCC 15707 were purchased in lyophilized form from the American Type Culture Collection (ATCC, Rockville, MD. USA), whereas *B. breve* NCFB 2258 and *B. bifidum* NCFB 2715 were obtained from the National Collection of Food Bacteria (Shinfield, UK).

2.2 Growth media

Bifidobacteria were inoculated (1% v/v) and grown in Lactobacilli MRS broth (Oxoid, Basingstoke, UK) supplemented with 5% (w/v) lactose (9). Solid medium was obtained by adding 1.5% Bacto-agar to the supplemented MRS broth. MRSL was supplemented with 0.05% (w/v) L-cysteine-HCl (Win Lab, Gemini House, Middlesex, Hab 7ET, UK) as a reducing agent. The