Chapter 14

Lactic Acid Bacteria
as Promoters of Human Health

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INTRODUCTION

Great interest in the healthful effects of lactic acid bacteria exists in the research, commercial, and consuming communities. The designation “lactic acid bacteria” applies to a functional grouping of non-pathogenic, gram positive bacteria that have lactic acid as a primary metabolic end-product and are traditionally used in food fermentations. These bacteria include species of Lactococcus, Lactobacillus, Streptococcus, Leuconostoc, and Pediococcus. Bifidobacterium and Enterococcus species are also included in this group when addressing issues related to bacterial inoculants for health promotion. For some health-promoting applications, lactic acid bacteria of intestinal origin are specifically targeted. These include Lactobacillus species of intestinal origin, all species of Bifidobacterium, and Enterococcus faecalis. Research is sometimes conducted on the bacterial strains themselves, or sometimes on the food products that harbor these bacteria. Nor-

It becomes obvious when reviewing this field that a broad range of opinions exists among experts as to the general effectiveness of lactic cultures in promoting human health. This range of opinions comes from various levels of stringency in reviewing the published literature. In this review, emphasis is placed on human over animal studies, on in vivo over in vitro studies, and on statistical significance over trends. When considering the large number of publications available in this field, it is apparent that this research area has suffered from lack of coordinated efforts between the clinicians and the microbiologists, and that differences in strains, levels, model systems, and stringency of data interpretation lead to apparent inconsistencies in conclusions from published research.

Although research support is lacking for many claims of culture-induced promotion of human health, products containing lactic cultures are marketed as health-promoting worldwide. In many cases, the lactic cultures present in the foods provide many functional (acid production, flavor enhancement, textural improvements in a fermented product) and nutritional (ease of digestibility, improved availability of some nutrients) advantages. Some products also carry a complement of intestinal lactic bacteria that are added solely for their stated positive influence on human health. Although lactic cultures of intestinal origin have not been used widely as fermentative