Chapter One

History and development of probiotics
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1.1 INTRODUCTION

The word ‘probiotic’ is derived from the Greek meaning ‘for life’ and has had several different meanings over the years. It was first used by Lilley and Stillwell in 1965 to describe substances secreted by one microorganism which stimulated the growth of another. It thus meant the exact opposite of ‘antibiotic’ and its etymological pedigree was beyond reproach. However, its use in this form did not persist and it was subsequently used by Sperti (1971) to describe tissue extracts which stimulated microbial growth. It was not until 1974 that Parker used it in the context in which we shall use it in this book. His definition was ‘Organisms and substances which contribute to intestinal microbial balance’. This definition related probiotic use to the intestinal microflora but the inclusion of ‘substances’ gave it a wide connotation which would include antibiotics. In an attempt to improve the definition, Fuller (1989) redefined probiotics as ‘A live microbial feed supplement which beneficially affects the host animal by improving its intestinal microbial balance’. This revised definition stressed the need for a probiotic to be viable.

1.2 HISTORY

Although the word ‘probiotic’ relating to feed supplements only dates from 1974, the history of live microbial feed supplements goes back thousands of years. Probably the first foods that contained living microorganisms were the fermented milks that are recorded in the Old Testament (Genesis 18:8). There is also evidence from wall paintings dating back to 2500 B.C. that the Sumarians were in the habit of inoculating milk to induce fermentation (see Kroger et al., 1989). While the health benefits for the individual can only be inferred, the
effect on prevention of spoilage would undoubtedly have a beneficial effect on the health of the community.

The consumption of fermented milks in many different forms has continued until the present day. The beneficial effects of yoghurt were put on a scientific basis at the beginning of the century. Elie Metchnikoff, working at the Pasteur Institute in Paris, played a key role in the process. He had long regarded the microflora of the lower gut as having an adverse effect on the health of the human adult. So convinced was he of this that he had advocated surgical removal of the colon. However, he was converted to a less invasive therapy by the finding that Bulgarian peasants, who ingested large amounts of soured milks, also lived to a ripe old age. He was in no doubt that the two observations were related.

It should be emphasized that Metchnikoff was concerned with sour milk rather than what we now call yoghurt, but subsequently when pure cultures became available he advocated the use of milk fermented with a single strain of lactobacillus. The early work was done with a strain called the 'Bulgarian bacillus'. This is almost certainly identical with the organism that was subsequently named Bacillus bulgaricus and later became Lactobacillus bulgaricus. The lactobacillus that is responsible for the fermentation of yoghurt is now called L. delbrueckii subsp. bulgaricus and acts in concert with Streptococcus salivarius subsp. thermophilus to produce the yoghurt we know today. It is impossible to know with any certainty which species Metchnikoff and his contemporaries were studying but it is likely that unintentional mixtures of lactobacilli were sometimes used (D.J. Bibel, pers. comm.). Based on this and other people's findings with regard to the health benefits of fermented milks, Metchnikoff wrote a book which, in the original French edition published in 1907, was entitled Essais Optimistes. In the book he discussed the philosophy, literature, religion, folklore and science of ageing. Only a small part of this discourse contained his views on the lower gut flora and the beneficial effects that fermented milk might have on it. At the end of this section of the book, in the English edition, he concludes:

If it be true that our precocious and unhappy old age is due to poisoning of the tissues (the greater part of the poisoning coming from the large intestine inhabited by numberless microbes), it is clear that agents which arrest intestinal putrefaction must at the same time postpone and ameliorate old age. This theoretical view is confirmed by the collection of facts regarding races which live chiefly on soured milk, and amongst which great ages are common. However, in a question so important, the theory must be tested by direct observations. For this purpose the numerous infirmaries for old people should be