Nutritional probiosis: An essential or optional dietary strategy?

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Nutritional probiosis is a dietary strategy that involves the feeding of probiotic bacteria formulations as a functional food supplement (1). Most often, these bacteria are delivered as live formulations presented in capsular form or as additives in milk and other beverages (2). To ensure increased efficacy, these consumable nutraceuticals may be further complemented by the addition of non-digestible carbohydrates or prebiotics such as starch amylose or inulin. In Asia, other functional ingredients such as bird's nest, gingseng and extracts from Shitake mushroom may also be added as a blend capable of conferring increased health benefits. The bioefficacy, safety and labelled health claims of manufacturers for these functional foods and their additives is presently the subject of much international, scientific and legislative debate.

Conceptually, the consumption of live bacteria in fermented foods has been common practise for centuries. More recently, intensive poultry, cattle and pig production systems have adopted probiotic supplementation as alternatives to in-feed antibiotic growth promotants. The adoption of organic and antibiotic-free farming practices for white meat production may confer a distinct market advantage by enabling Australia to export white meat products overseas with a clean-green image. Delivery of prebiotics and probiotics are believed to improve intestinal health and function by altering the balance of good/bad microbial populations and through immunomodulation. Unfortunately, these generic concepts have not been convincingly supported by available scientific data and accordingly, are receiving attention as research priorities in our laboratory.

Recent epidemiological surveys have shown an inverse relationship between the frequency of infectious disease and the incidence of allergies in the human population. This has led to the 'hygiene hypothesis' that infection in early childhood acquired through unhygienic contact with siblings or the mother may prevent the development of allergic disease (3). Feeding certain killed pathogenic bacteria can stimulate an immune challenge to the mucosal system similar to unhygienic exposure to environmental microbes. These challenges divert the immune system from a Th2 immune response involving the production of cytokines that promote allergen-reactive IgE antibodies to a Th1 immune response favouring cell mediated immunity (4). Using animal models, we will present data from our laboratory to demonstrate that dietary probiosis involving the oral feeding of live friendly probiotic bacteria or killed pathogenic bacteria can improve health by immunomodulation (5,6) and by altering the population dynamics of intestinal bacterial populations. The available evidence indicates that nutritional probiosis with dietary bacteria feeding is of benefit to the consumer.

References

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