HFMA Bulletin

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The microbiome-gut-brain axis

In recent years, observers have commented on the rising burden of mental health concerns across the world. Indeed, conversations about mental health seem to be far more part of regular discourse today. According to Mind, one in four people will experience a mental health problem of some kind each year in England, and one in six report experiencing a common mental health problem (like anxiety) in any given week.

Increasingly, academic research groups around the world are looking at how food supplements and nutritional interventions might impact mental wellbeing. Nutritional psychiatry is an emerging field that looks at the effect our diet can have on mental health, with particular interest in the role of gastrointestinal microbiome.

The microbiome-gut-brain axis describes the two-way communication that happens between the bacteria (and other microorganisms) in the gut and the brain. This communication occurs through three main pathways: the nervous system, the immune system and the endocrine (or hormonal) system.

Academics around the world are seeking to understand how the gut might have an effect on the physiology of the brain. Current areas of research include understanding how different groups of microorganisms in the gut might affect the levels of mood-regulating neurotransmitters, such as serotonin (the happy hormone) and GABA. The microbiome has also been shown to have an effect on the cortisol-hypothalamic-pituitary-adrenal axis, which is important in our bodies' stress response.

Currently, most research into the microbiome-gut-brain axis consists of small, exploratory human trials and pre-clinical models. In 2019 a group of academics produced a review of the current published data, examining the results from 23 different human clinical trials investigating the effect of live microbial and fibre supplementation in individuals with mood disorders. Overall, the review found a significant improvement in depressive symptoms in those individuals taking live microbial supplements.

In 2022, researchers at the University of Oxford completed a clinical trial using an orally administered live microbial supplement to examine changes in psychological processing and measurements of low mood. The study explored the effects of daily intake by volunteers (n = 71), in a four-week randomized double-blind placebo-controlled study. The researchers observed some intriguing results from a variety of validated questionnaires, emotional and cognitive tests and analysis of salivary cortisol and serum C-reactive protein. The study demonstrated that the multispecies live microbial supplement altered aspects of emotional processing and reward learning, with improvements noted in mood scores measured by the PHQ-9 questionnaire.

In the coming years a number of new clinical trials related to microbiome-gut-brain axis will be published. This will provide invaluable new data on how the microorganisms of the gut might be affecting outcomes relevant for mental health and will provide consumers with a new range of product choices for mental wellbeing.