

REVIEW

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Dual-coated lactic acid bacteria: an emerging innovative technology in the field of probiotics

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Summary points

- Probiotics are live micro-organisms which when administered in adequate amounts confer a health benefit on the host.
- Lactic acid bacteria (LAB) are sensitive to environmental exposure and its viability is easily affected during processing, storage and ingestion.
- Formulations of patented probiotics coated with a peptide/protein matrix (first coating layer) and a hydrocolloidal polysaccharide matrix (second coating layer) can assure the protection of these bacteria at least 100-fold or greater than the uncoated LAB.
- The first coating layer offers a pH-dependent release system, protecting LAB against gastric acid and bile salts in the stomach and duodenum, ensuring safe arrival in the small intestine in good conditions to colonize and proliferate.
- The second coating layer protects the bacteria against moisture, temperature, mechanical pressure and so on, which increases stability during manufacture and shelf life of the product.
- The efficacy of the double coated system of a multispecies probiotic mixture has demonstrated in a variety of conditions, including irritable bowel syndrome, acute diarrhea, atopic dermatitis and in *H. pylori* eradication, as the most relevant.

Probiotics are living micro-organisms that do not naturally have shelf life, and normally are weakly protected against the digestive action of the GI tract. A new dual coating technology has been developed in an effort to maximize survival, that is, to be able to reach the intestine alive and in sufficient numbers to confer the beneficial health effects on the host. Dual-coating of lactic acid bacteria (LAB) is the result of fourth-generation coating technology for the protection of these bacteria at least 100-fold or greater than the uncoated LAB. This innovative technique involves a first pH-dependent protein layer that protects bacteria from gastric acid and bile salt, and a second polysaccharide matrix that protects bacteria from external factors, such as humidity, temperature and pressure, as well as the digestive action during the passage through the GI tract. Dual-coated probiotic formulation is applicable to different therapeutic areas, including irritable bowel syndrome, atopic dermatitis, acute diarrhea, chronic constipation, *Helicobacter pylori* eradication, and prevention of antibiotic-associated diarrhea. An updated review of the efficacy of doubly coated probiotic strains for improving bacterial survival in the intestinal tract and its consequent clinical benefits in humans is here presented.

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