

# Industrial-scale Production of Microencapsulated Lactic Acid Bacteria

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## Abstract

Lactic acid bacteria (LAB) are a heterogeneous group of gram-positive bacteria. They are generally recognized as safe (GRAS) and occupy a central role in the food industry for centuries. LAB has been widely used in many industrial applications as a starter culture in production of fermented food products and as biocontrol agent in food preservation. In addition, many strains of LAB have probiotic properties that colonize the host mucosal surfaces, including gut, where they may contribute to host health. Several factors affect the viability of LAB during food manufacturing, storage and after consumption during transition through the gastrointestinal tract. Two options could maintain the viability of probiotics. Selecting resistant probiotic strains or genetically modified one to adapt the stress conditions or developing an effective encapsulating delivery system. Microencapsulation appears to be one of the promising techniques in protecting the LAB. Encapsulation efficiency was affected by the capsule size, carrier agent, encapsulation technique and the probiotic cell load. Several methods and carrier agents have been investigated and appeared promising, however, in the laboratory scale. Designing a good delivery system for industrial scale production could be performed through understanding the characteristic features of the entrapped bacteria and how it interact with the carrier agent, the kind of the exposed stress, the required capsule size and the *in vivo* assessment for its benefit on the human health.

**Keywords:** Lactic acid bacteria, probiotic, Microencapsulation

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