Effect of the spray drying wall-materials on the viability of L. rhamnosus storage at different temperatures

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The Lactobacillus rhamnosus is one of the most studied probiotics associated with beneficial effects such as prevention of antibiotic-associated diarrhea, treatment of relapsing Clostridium difficile diarrhea, treatment, and prevention of rotavirus diarrhea, prevention of acute diarrhea and enhancement of intestinal immunity. In the last decade, many reports showed that uncounted probiotic survival is reduced in several storage conditions. Microencapsulation processes play an essential role in protecting the viability and enhance the probiotic survival against adverse environmental conditions. Spray drying is the most common process used to preserve the probiotics viability. This study aimed to evaluate the impact of the spray drying wall-materials on the viability of L. rhamnosus storage at different temperatures. The L. rhamnosus HN001 was obtained from the collection of CIATEJ, A.C. (Jalisco, Mexico). Gum Arabic (GA), agavins (AgF), and inulin (In) were used as wall materials. Probiotics were mixed and spray dried at 160 °C. The storage stability of encapsulated probiotic was evaluated during six weeks at 4 and 20 °C. The encapsulation efficacy was approximately 98% to GA, 94% to GA+AgF, and 95% to GA+In after spray drying. The best probiotic viability was observed for microcapsules produced with GA at 4 °C. The number of probiotics found in the GA+In microcapsules, did not reach the recommended levels by the WHO after six weeks of storage at 20 °C. The wall materials and storage conditions should be carefully selected to improve the probiotic survival.

Biography

Hugo Espinosa-Andrews is a researcher at the Area Food technology works at the Research Center and Assistance in Technology and Design of the State of Jalisco, A.C. (CIATEJ, AC). He specializes in the areas of food colloids, food emulsions and development of delivery systems for bioactive components. His research interest includes: biopolymers, bioactive compounds, emulsion, suspensions, encapsulation techniques, nanotechnology, and delivery systems. Dr. Espinosa received his Ph.D. in Chemical Engineering at the Autonomous Metropolitan University (Mexico City). He has published 26 scientific papers in international journals and above 60 conference proceedings. He has more than 500 citations, and his h-index is 10. He has three patent applications in PCT and seven national requests in the Mexican Institute of Industrial Property (IMPI).