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Drying process strongly affects probiotics viability and functionalities

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Abstract

Probiotic formulations are widely used and are proposed to have a variety of beneficial effects, depending on the probiotic strains present in the product. The impact of drying processes on the viability of probiotics is well documented. However, the impact of these processes on probiotics functionality remains unclear. In this work, we investigated variations in seven different bacterial markers after various desiccation processes. Markers were composed of four different viability evaluation (combining two growth abilities and two cytometric measurements) and in three *in-vitro* functionalities: stimulation of IL-10 and IL-12 production by PBMCs (immunomodulation) and bacterial adhesion to hexadecane. We measured the impact of three drying processes (air-drying, freeze-drying and spray-drying), without the use of protective agents, on three types of probiotic bacteria: *Bifidobacterium bifidum*, *Lactobacillus plantarum* and *Lactobacillus zeae*. Our results show that the bacteria respond differently to the three different drying processes, in terms of viability and functionality.