

## **Development of milk protein edible films incorporated with *Lactobacillus rhamnosus* GG**

### **ABSTRACT**

Bioactive edible films have the potential to be probiotic carriers. This innovative approach can replace plastic packaging and can benefit human health. This study demonstrated the incorporation of *Lactobacillus rhamnosus* GG (LGG) into whey protein isolate (WPI) and sodium caseinate (NaCas) edible films. Probiotic cells were directly incorporated into the film forming solutions, and the films were produced by the casting method. The physical, mechanical, and probiotic viability properties of the edible films were determined in the presence and absence of LGG. Furthermore, the viability of LGG was evaluated during the drying process and storage of 14 days at 4 °C and 25 °C, respectively. The results showed the incorporation of LGG increased the moisture content, puncture force, and lightness of both films. However, viability of LGG was lower in the WPI film regardless of storage temperature. At the end of storage days, both WPI and NaCas edible films maintained the LGG viability above the recommended levels when stored at 4 °C, which was  $10^6$  CFU/g. The findings of this study suggested that edible films made of WPI and NaCas showed feasibility to immobilize LGG with chilled storage at 4 °C.

**Keyword:** Edible film; Whey protein isolate; Sodium caseinate; Probiotics; Bioactive packaging