

Characterization and cell viability of probiotic/prebiotics film based on duck feet gelatin: A novel poultry gelatin as a suitable matrix for probiotics

ABSTRACT

The probiotic viability, physicochemical, mechanical, barrier, and microstructure properties of synbiotic edible films (SEFs) based on duck feet gelatin (DFG) were evaluated. Four synbiotic systems were obtained by mixing four types of prebiotics, namely, dextrin, polydextrose, gum Arabic, and sago starch, with DFG to immobilize of probiotic (*Lactobacillus casei* ATCC). The ability of DFG to create a suitable matrix to increase probiotic viability was compared with those of other commercial gelatins in a preliminary evaluation. The DFG showed proper probiotic viability compared with other gelatins. The addition of prebiotics reduced the transparency of SEFs and increased color differentiation, uniformity, and complete coverage of probiotic cells. The estimated shelf-life of surviving bacteria in the SEFs stored at 4 and 25 °C showed that gum arabic showed the best performance and enhanced the viability of *L. casei* by 42% and 45%, respectively. Dextrin, polydextrose, and sago starch enhanced the viability of *L. casei* at 4 and 25 °C by 26% and 35%, 26% and 5%, and 20% and 5%, respectively. The prebiotics improved the physicochemical, mechanical, and barrier properties of all SEFs, except polydextrose film. The viability of *L. casei* can be increased with the proper selection of gelatin and prebiotics.