

Abstract

The increasing demand for sustainable protein sources has driven the exploration of edible insects as alternative functional ingredients. Cricket (*Acheta domesticus*) powder is recognized for its high protein content and potential prebiotic properties due to the presence of chitin. However, its application in frozen dairy products such as ice cream remains limited. This study aimed to evaluate the effect of cricket powder fortification on soluble protein concentration following pepsin digestion, bacterial growth, and pH changes in ice cream. Four ice cream formulations containing 0% (control), 9%, 12%, and 15% cricket powder were prepared. Soluble protein concentration after pepsin digestion was determined using the Bradford protein assay following simulated gastric digestion with pepsin. Bacterial growth was assessed using the growth response of *Lactobacillus acidophilus*, *Lactobacillus casei*, and *Lactobacillus plantarum* through colony count observations, while pH changes were measured to monitor microbial metabolic activity. The control formulation had the highest soluble protein concentration, while the 15% cricket powder formulation had the lowest value. The results showed that increasing the content of cricket powder reduced the concentration of soluble protein found following pepsin digestion. On the other hand, all studied *Lactobacillus* strains showed lower final pH values and greater colony counts when fortified with cricket powder, which encouraged bacterial growth and increased acid production. Bacterial growth and pH lowering were consistently highest in the mixture containing 15% cricket powder. In conclusion, cricket powder-fortified ice cream has potential as a sustainable functional food product with improved nutritional and microbiological properties.

Keywords: *cricket powder, ice cream, in vitro digestion, Lactobacillus, prebiotic*