

## INTISARI

Penelitian ini bertujuan untuk mengetahui viabilitas probiotik tersalut sebelum dan sesudah pengeringan semprot, stabilitas probiotik dalam mikrokapsul saat dilakukan penyimpanan di suhu ruang dan suhu rendah 4°C dalam pengemasan vakum dan non-vakum, dan pengaruh pH terhadap kemampuan bakteri probiotik BAL dapat lepas (*release*) dari enkapsulan pada kondisi gastrointestinal.

Probiotik BAL yang digunakan terdiri atas *Streptococcus thermophilus* strain Kp-2, *Lactobacillus murinus* strain Ar-3, dan *Pediococcus acidilactici* strain Kd-6. Sebelum dilakukan mikroenkapsulasi, dilakukan fermentasi dengan media tetes tebu untuk mendapatkan biomassa probiotik. Mikroenkapsulasi probiotik dilakukan dengan penyalutan dengan *whey*, pati jagung tinggi amilosa, dan alginat yang dengan metode pengeringan semprot pada suhu inlet/outlet 140/60°C. Mikrokapsul probiotik disimpan dalam pengemas PET vakum dan non vakum di suhu ruang dan suhu rendah 4°C. Probiotik terenkapsulasi diuji secara *in vitro* dengan larutan *bile salt* (w/v) 0,3% dan pengaturan pH.

Hasil penelitian menunjukkan bahwa viabilitas probiotik tersalut sebelum pengeringan semprot adalah  $1,07 \times 10^{22}$  CFU dan sesudah dilakukan pengeringan semprot adalah  $1,97 \times 10^{17}$  CFU. Pada saat penyimpanan, perlakuan suhu penyimpanan dan jenis bahan pengemas PET berpengaruh secara signifikan terhadap stabilitas bubuk mikrokapsul. Pada pengujian secara *in vitro*, terjadi peningkatan viabilitas bakteri probiotik pada menit ke 220 pada kondisi pH 6,5 saat diperkirakan bakteri probiotik berada pada usus halus. Viabilitas bakteri pada saat tersebut mencapai  $5,38 \times 10^6$  CFU.

Kata kunci: probiotik, mikroenkapsulasi, pengeringan semprot, viabilitas, stabilitas

## ABSTRACT

### **Microencapsulation of Lactic Acid Bacteria Probiotics with Whey, High Amylose Corn Starch, and Alginat as Coating Materials Using Spray Drying Method.**

This study was conducted to investigate the viability of microencapsulated probiotics before and after pendinginan semprot, the stability of probiotics in microcapsules when stored at room temperature and low temperature of 4°C in vacuum and non-vacuum packaging, and the effect of pH on the ability of LAB probiotic bacteria to be released from the encapsulation in gastrointestinal environment.

The probiotic of LAB used were *Streptococcus thermophilus* strain Kp-2, *Lactobacillus murinus* strain Ar-3, and *Pediococcus acidilactici* strain Kd-6. Before microencapsulation, fermentation was carried out with molasses as the substrate to obtain probiotic biomass. Microencapsulation was conducted by spray-drying method with an inlet/outlet temperature of 140/60°C using whey protein, high amylose corn starch (HACS), and alginat as coating materials. Probiotic microcapsules were stored in vacuum and non-vacuum PET packaging at room temperature and low temperature of 4°C. The effectiveness of the encapsulated probiotic was analyzed in vitro with bile salt 0.3% and pH adjustment.

The result shows that the viability of coated probiotics before spray drying was  $1,07 \times 10^{22}$  CFU and after spray drying was  $1,97 \times 10^{17}$  CFU. During storage, the temperature of the treatment and the type of PET packaging material significantly influence the microcapsule's stability. In the in-vitro examination, there was an increase in probiotic bacteria's viability at 220 minutes at pH of 6.5 was estimated that probiotic bacteria could reach the small intestine of the chicken with viability of  $5,38 \times 10^6$  CFU.

Keywords: probiotics, microencapsulation, spray drying, viability, stability.