

**STABILITAS MIKROKAPSUL PROBIOTIK BAKTERI ASAM
LAKTAT DENGAN PENYALUT CAMPURAN SUSU SKIM, PATI
JAGUNG TINGGI AMILOSA, DAN ALGINAT DENGAN METODE
PENGERINGAN SEMPROT**

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ABSTRAK

Bahan penyalut dan metode enkapsulasi dieksplorasi untuk melindungi probiotik agar viabilitas dan stabilitasnya terjaga. Penelitian ini dilaksanakan untuk mengenkapsulasi probiotik campuran menggunakan penyalut susu skim, pati jagung tinggi amilosa, dan alginat. Tujuannya untuk mempertahankan viabilitasnya selama pengeringan semprot, mengetahui waktu *release*, stabilitas penyimpanan berbagai kondisi suhu dan pengemasan serta umur simpannya untuk dapat memberikan efek kesehatan.

Produksi mikrokapsul mula-mula dilakukan dengan meremajakan *Lactobacillus murinus* Ar-3, *Streptococcus thermophilus* Kp-2, *Pediococcus acidilactici* Kd-6 dalam media PGY kemudian dicampurkan dengan rasio 1 : 1,16 : 1,18 dan dilakukan fermentasi molase. Probiotik dipanen lalu dienkapsulasi dengan mencampurkan bahan penyalut, dilanjutkan pengeringan semprot. Pengujian dilakukan dengan menghitung jumlah bakteri sebelum dan setelah pengeringan semprot, *releasing time* serta stabilitas selama penyimpanan 21 hari melalui metode *Total Plate Count* (TPC).

Hasil penelitian menunjukkan bahwa viabilitas sebelum dan setelah pengeringan semprot berturut-turut sebesar $7,66 \times 10^{24}$ dan $2,04 \times 10^{20}$ CFU. Hasil pengujian *releasing time* pada larutan 0,3% *bile salt* dengan pengaturan pH yaitu menit ke 220 sebesar $2,52 \times 10^4$ CFU. Ketika bubuk enkapsulan disimpan dalam kondisi suhu dan kemasan yang berbeda, stabilitas bakteri probiotik terenkapsulasi cenderung mengalami penurunan setelah penyimpanan selama 21 hari. Kondisi penyimpanan bubuk enkapsulan terbaik ditinjau dari log penurunan viabilitas bakteri terkecil yaitu pada kondisi penyimpanan suhu ruang non vakum.

Kata Kunci : *Lactobacillus murinus* Ar-3, *Streptococcus thermophilus* Kp-2, *Pediococcus acidilactici* Kd-6, Enkapsulasi, Pati Jagung Tinggi Amilosa, Susu Skim, Alginat, *Time Release*.

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**STABILITY OF LACTIC ACID BACTERIA PROBIOTIC
MICROCAPSULES USING SKIM MILK, HIGH AMYLOSE CORN
STARCH, AND ALGINATE COATING MIXTURE BY SPRAY
DRYING METHOD**

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ABSTRACT

Coating materials and encapsulation methods were explored to protect and maintain probiotic's viability and stability. This research was conducted to encapsulate probiotic mixture using skim milk, high amylose corn starch (HACS) and alginate. The goals were maintaining viability during spray drying, determining the releasing time, storage stability of various temperature and packaging conditions, also shelf life to provide health benefit.

Firstly, microcapsule production was carried out by rejuvenating *Lactobacillus murinus* Ar-3, *Streptococcus thermophilus* Kp-2, *Pediococcus acidilactici* Kd-6 in GYP medium then mixed with ratio 1: 1.16: 1.18 and used for molasses fermentation. The cells were harvested and encapsulated by mixing them with coating materials and alginate, followed by spray drying. Evaluation were performed by counting the number of bacteria before and after spray drying, releasing time and stability after 21 days of storage using Total Plate Count (TPC) methods.

The results showed that viability before and after spray drying were $7,66 \times 10^{24}$ and $2,04 \times 10^{20}$ CFU. Evaluation of releasing time in 0.3% bile salt solution with pH adjustment at 220 minutes was $2,52 \times 10^4$ CFU. When the encapsulated powder stored under different temperature and packaging conditions, the stability of encapsulated probiotic bacteria tend to decrease after 21 days storage. The best storage condition of encapsulated powder reviewed from the smallest log reduction in bacterial viability were non vacuum room temperature storage condition.

Keywords : *Lactobacillus murinus* Ar-3, *Streptococcus thermophilus* Kp-2, *Pediococcus acidilactici* Kd-6, Encapsulation, High Amylose Corn Starch (HACS), Skim Milk, Alginate, Time Release.

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