

## PENGARUH KADAR AIR PADA PROSES MIKROENKAPSULASI *LIMOSILACTOBACILLUS FERMENTUM* BN21 DENGAN TEPUNG BERAS TERHADAP VIABILITAS BAKTERI

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### INTISARI

Bakteri asam laktat, seperti *Limosilactobacillus fermentum* BN21 sebagai alternatif pengganti *antibiotic growth promotor* untuk ayam broiler memerlukan preservasi untuk menjaga viabilitas bakteri, salah satunya melalui mikroenkapsulasi. Penelitian ini bertujuan untuk mengetahui pengaruh kadar air, yakni 40% dan 50% pada proses mikroenkapsulasi bakteri asam laktat *Limosilactobacillus fermentum* BN21 dengan tepung beras terhadap viabilitas bakteri, baik sebelum, maupun setelah pengeringan dengan oven. Perlakuan yang diberikan, yakni perbedaan kadar air (40% dan 50%) serta pengeringan oven (sebelum dan setelah) pada suhu 40°C selama 12 jam. Parameter yang diamati meliputi total koloni bakteri asam laktat, kadar asam laktat, angka asam, kadar glukosa, dan nilai pH. Data yang diperoleh kemudian dianalisis dengan Rancangan Acak Lengkap (RAL) pola faktorial 2x2 (2 perlakuan kadar air dan 2 perlakuan pengeringan oven) dengan 6 kali ulangan. Hasil penelitian menunjukkan bahwa kadar air 40% pada proses mikroenkapsulasi bakteri *Limosilactobacillus fermentum* BN21 dengan tepung beras mampu menghasilkan jumlah bakteri yang lebih tinggi ( $10,35 \pm 0,13$  log CFU/g) dibandingkan kadar air 50% ( $10,02 \pm 0,38$  log CFU/g) ( $P < 0,05$ ) dan nilai pH yang lebih rendah ( $4,38 \pm 0,03$ ) dibandingkan dengan kadar air 50% ( $4,78 \pm 0,61$ ) ( $P < 0,05$ ). Mikroenkapsulasi bakteri dengan tepung beras juga mampu mempertahankan viabilitas bakteri setelah pengeringan dengan oven, diketahui dari hasil penelitian pada parameter kadar asam laktat ( $4,13 \pm 1,08$  mg/mL) dan kadar glukosa ( $28,84 \pm 9,31$  mg/mL) yang tidak jauh berbeda dengan sebelum pengeringan oven ( $4,30 \pm 1,60$  mg/mL) dan  $33,18 \pm 9,84$  mg/mL) ( $P < 0,05$ ). Mikroenkapsulasi bakteri dengan tepung beras dengan kadar air 40% mampu mempertahankan viabilitas bakteri setelah pengeringan dengan oven dengan jumlah bakteri yang tinggi dan mampu menurunkan nilai pH lingkungan.

Kata kunci: bakteri asam laktat, mikroenkapsulasi, kadar air dan tepung beras

## EFFECT OF MOISTURE CONTENT IN THE MICROENCAPSULATION PROCESS OF *LIMOSILACTOBACILLUS FERMENTUM* BN21 WITH RICE FLOUR ON BACTERIAL VIABILITY

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### ABSTRACT

Lactic acid bacteria, such as *Limosilactobacillus fermentum* BN21 as an alternative to *antibiotic growth promotor* for broiler chickens require preservation to maintain bacterial viability, one of which is through microencapsulation. This study aimed to determine the effect of moisture content, namely 40% and 50% in the microencapsulation process of lactic acid bacteria *Limosilactobacillus fermentum* BN21 with rice flour on bacterial viability, both before and after oven drying. The treatments were different moisture contents (40% and 50%) and oven drying (before and after) at 40°C for 12 hours. The parameters observed included total lactic acid bacteria colonies, lactic acid level, total acid value, glucose level, and pH value. The data obtained were then analyzed with a Completely Randomized Design (CRD) 2x2 factorial pattern (2 moisture content treatments and 2 oven-drying treatments) with 6 replications. The results showed that 40% moisture content in the microencapsulation process of *Limosilactobacillus fermentum* BN21 with rice flour was able to produce a higher number of bacteria ( $10.35 \pm 0.13$  log CFU/g) compared to 50% moisture content ( $10.02 \pm 0.38$  log CFU/g) ( $P < 0.05$ ) and a lower pH value ( $4.38 \pm 0.03$ ) compared to 50% moisture content ( $4.78 \pm 0.61$ ) ( $P < 0.05$ ). Microencapsulation of bacteria with rice flour is also able to maintain bacterial viability after oven drying, as known from the results of the study on the parameters of lactic acid levels ( $4.13 \pm 1.08$  mg/mL) and glucose levels ( $28.84 \pm 9.31$  mg/mL) which are not much different from before oven drying ( $4.30 \pm 1.60$  mg/mL and  $33.18 \pm 9.84$  mg/mL) ( $P < 0.05$ ). Microencapsulation of bacteria with rice flour with 40% moisture content was able to maintain bacterial viability after oven drying with a high number of bacteria and was able to reduce the pH value of the environment.

Keywords: Lactic acid bacteria, microencapsulation, moisture content, and rice flour