

**Pengaruh Suplementasi Mikrokapsul Probiotik Bakteri Asam Laktat
Indigenous Unggas terhadap Penampilan Pertumbuhan Ayam
Broiler Fase Starter**

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INTISARI

Penelitian ini dilaksanakan untuk mengkaji pengaruh mikroenkapsulasi probiotik bakteri asam laktat yang tersusun dari *Streptococcus termophilus*, *Lactobacillus murinus*, dan *Pediococcus acidilactici* terhadap penampilan pertumbuhan ayam broiler fase starter. Penelitian tahap pertama dilakukan mikroenkapsulasi probiotik menggunakan bahan penyalut campuran susu skim dan maltodekstrin. Variabel yang diukur adalah viabilitas probiotik sebelum dan sesudah mikroenkapsulasi meliputi viabilitas selama penyimpanan dan pasca pemanasan suhu 80 hingga 85° C, kadar air dan aktivitas air (*water activity*), dan morfologi mikrokapsul probiotik BAL dengan *Scanning Electron Microscopy* (SEM). Penelitian tahap kedua dilakukan uji eksklusi kompetitif probiotik BAL sebelum dan sesudah mikroenkapsulasi terhadap *Escherichia coli* dan *Salmonella enteritidis*. Penelitian tahap ketiga digunakan 48 ekor *day old chicks* MB-202 *New Lohmann* platinum untuk menguji pengaruh suplementasi mikrokapsul probiotik MIX terhadap konsumsi pakan, penambahan bobot badan, bobot panen, konversi pakan, anatomi dan histologi usus halus. Data yang diperoleh dianalisis statistik menggunakan analisis variansi rancangan acak lengkap pola searah dan dilanjutkan dengan uji *Duncan's new Multiple Range Test*; kecuali data viabilitas sebelum dan sesudah *spray drying* diuji dengan t-test. Hasil penelitian tahap pertama menunjukkan *P. acidilactici* secara nyata tahan terhadap suhu *spray drier*. Viabilitas probiotik MIX dan *P. acidilactici* lebih dari 70,00% selama 4 minggu penyimpanan dan terus menurun hingga 7 minggu. Pemanasan probiotik dalam pakan pada suhu 80-85° C selama 15 detik menunjukkan viabilitas masing-masing strain lebih dari 87%. Sementara penambahan waktu pemanasan selama 30 detik menurunkan viabilitas masing-masing strain menjadi lebih dari 77%, kecuali pada *S. termophilus* tidak menunjukkan penurunan yang nyata. Hasil penelitian tahap kedua menunjukkan bahwa *spray drying* menurunkan secara nyata daya antagonistik probiotik terhadap *E. coli* dan *S. enteritidis*, kecuali pada *S. termophilus*. Hasil penelitian tahap ketiga menunjukkan bahwa suplementasi probiotik MIX pada ayam broiler fase starter tidak mempengaruhi konsumsi pakan, namun meningkatkan penambahan bobot badan, bobot panen, dan memperbaiki konversi pakan. Panjang duodenum, jejunum, dan ileum tidak berbeda nyata dengan kontrol, sedangkan panjang sekum pada level 1,5 g/kg pakan meningkat secara nyata dibandingkan kontrol. Pemberian probiotik pada level 1,5 g/kg pakan memberikan pengaruh yang signifikan terhadap berat jejunum dan sekum. Kesimpulan yang diperoleh adalah probiotik MIX (kultur campuran) lebih baik viabilitasnya dibanding probiotik kultur tunggal; daya antagonistik probiotik terhadap patogen menurun setelah mikroenkapsulasi, serta suplementasi probiotik MIX meningkatkan profil saluran pencernaan dan penampilan pertumbuhan ayam broiler fase starter.

Kata kunci: Probiotik BAL, Mikroenkapsulasi, Eksklusi kompetitif, Ayam broiler, Penampilan pertumbuhan

**Effect of Supplementation of Microencapsulated Indigenous Probiotics
Lactic Acid Bacteria on the Performance of Broiler Chickens
at a Starter Phase**

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ABSTRACT

The experiments were conducted to determine the effect of microencapsulated probiotics lactic acid bacteria consisted of *Lactobacillus murinus*, *Streptococcus termophilus*, and *Pediococcus acidilactici* on the performance of broiler chickens at a starter phase. In the first stage of experiments, probiotics were microencapsulated using the mixture of skim milk powder and maltodextrin as coating material. Variable measured were viability of probiotics before and after microencapsulation comprised viability during storage and viability after heating on temperature 80 to 85° C, moisture and water activity, and morphology of microcapsule probiotics by scanning electron microscopy (SEM). In the second stage of experiments, LAB probiotics were tested for competitive exclusion before and after microencapsulation on *Escherichia coli* dan *Salmonella enteritidis*. In the third stage of experiments were reared 48 day old chicks MB-202 New Lohmann platinum to examined the effect of supplementation of microencapsulated probiotic MIX on feed consumption, body weight gain, live weight, feed conversion ratio, anatomy and histology of small intestine. The data were analyzed using analysis of variance followed by Duncan's new Multiple Range Test; except the data of viability before and after spray drying using t-test. The results of the first stage showed that *P. acidilactici* was significantly persisted to spray drier temperature. MIX probiotic and *P. acidilactici* had the viability up to 70,00% during 4 weeks of storage and continued to decrease up to 7 weeks. Heat treatment of probiotic mixed in feed at temperature 80-85° C during 15 seconds showed viability of each strains was up to 87%. Meanwhile, longer time of heat treatment during 30 seconds significantly decreased the viability of each strains to be more than 77%, except *S. termophilus*. The results of the second stage showed that spray drying significantly decreased antagonistic ability of probiotic on *E. coli* and *S. enteritidis*, except *S. termophilus*. The results of the third stage showed that MIX probiotic supplementation on broiler chickens at starter phase did not affect feed consumption, but affected significantly body weight gain, live weight, and feed conversion ratio. There was no significant different in the length of duodenum, jejunum, and ileum among treatments, whereas the length of cecum at level 1,5 g/kg feed was different significantly to control. Probiotic supplemented at level 1,5 g/kg feed showed significant effect to weight of jejunum and cecum. It can be concluded that probiotic MIX (mixed culture) had the best viability than single strain probiotic; antagonistic ability of probiotics was decrease on pathogen after microencapsulation; and probiotic MIX supplementation improved gastrointestinal tract profile and performance of broiler chicken at starter phase.

Keywords: Probiotics LAB, Microencapsulation, Competitive exclusion, Broiler chickens, Performance