

PENGARUH SUBSTITUSI *CRUDE PALM OIL* DENGAN MINYAK *BLACK SOLDIER FLY-LARVAE* (*Hermetia illucens* L.) TERSAPONIFIKASI TERHADAP PERFORMA DAN KINERJA SALURAN PENCERNAAN AYAM BROILER

INTISARI

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Minyak *black soldier larvae* (BSF-L) mengandung 43,10% asam laurat, yang merupakan salah satu jenis *medium chain fatty acid* (MCFA) yang dapat berfungsi sebagai antimikroba dan imunomodulator, sehingga dapat dijadikan alternatif pengganti *crude palm oil* (CPO). Penelitian ini bertujuan untuk mengetahui pengaruh substitusi CPO dengan minyak BSF-L tersaponifikasi terhadap performa dan kinerja saluran pencernaan ayam broiler. Penelitian ini menggunakan 280 ayam broiler *strain* new Lohman Indian River (MB 202 Platinum) berjenis kelamin jantan. Substitusi CPO dengan minyak BSF-L tersaponifikasi diberikan dengan jumlah yang berbeda. Total minyak di dalam ransum adalah 3% dengan perbandingan CPO dan minyak BSF-L tersaponifikasi, antara lain 3:0 (kontrol), 2:1, 1:2, dan 0:3. Setiap level perlakuan terdiri dari tujuh ulangan dan masing-masing ulangan terdapat sepuluh ekor ayam. Pemeliharaan ayam broiler selama 35 hari, dengan tiga fase pemeliharaan yaitu *starter*, *grower*, dan *finisher*. Pakan perlakuan mulai diberikan pada fase *grower*. Sampel yang dikoleksi adalah organ saluran pencernaan, yang selanjutnya diukur panjang, berat, dan pH digesta. Sampel usus halus bagian jejunum juga dianalisis histomorfologi vili usus dan ekspresi gen *tight junction*. Data yang diperoleh dianalisis variansi dengan mengikuti rancangan acak lengkap pola searah dan apabila terdapat perbedaan dilanjutkan dengan uji DMRT. Berdasarkan hasil analisis diketahui bahwa substitusi CPO dengan minyak BSF-L tersaponifikasi dengan perbandingan 3:0 menghasilkan performa terbaik dan menghasilkan panjang duodenum tertinggi. Substitusi CPO dengan perbandingan 2:1 menghasilkan nilai pH ileum lebih tinggi daripada perlakuan yang lain dan pada perbandingan 0:3 menghasilkan ekspresi gen *tight junction* tertinggi, tetapi dengan adanya substitusi tidak berpengaruh negatif terhadap berat relatif organ pencernaan dan histomorfologi vili bagian jejunum. Berdasarkan penelitian ini dapat diambil kesimpulan bahwa substitusi CPO dengan minyak BSF-L tersaponifikasi dengan perbandingan 3:0 menghasilkan performa terbaik. Substitusi CPO dengan minyak BSF-L tersaponifikasi dapat digunakan dalam pakan ayam broiler sampai dengan perbandingan 2:1.

Kata kunci: minyak BSF-L tersaponifikasi, performa ayam broiler, kinerja saluran pencernaan, *tight junction*

EFFECT OF SUBSTITUTING THE CRUDE PALM OIL WITH SAPONIFIED
BLACK SOLDIER FLY-LARVAE (*Hermetia illucens* L.) OIL ON THE
PERFORMANCE AND DIGESTIVE TRACT CHARACTERISTICS
OF BROILER CHICKENS

ABSTRACT

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Black soldier larvae oil (BSF-L) contains 43.10% lauric acid, which is a type of medium chain fatty acid (MCFA) which can function as an antimicrobial and immunomodulator, so it can be used as an alternative to crude palm oil (CPO). This research aims to determine the effect of substituting CPO with saponified BSF-L oil on the performance and digestive tract characteristics of broiler chickens. This research used 280 male broiler chickens of the new Lohman Indian River strain (MB 202 Platinum). Substitution of CPO with saponified BSF-L oil was given in different amounts. The total oil in the feed ration is 3% with a ratio of CPO and saponified BSF-L oil, including 3:0 (control), 2:1, 1:2, and 0:3. Each treatment level consisted of seven replications and each replication contained ten chickens. Broiler chickens are reared for 35 days, with three maintenance phases, namely starter, grower and finisher. Treatment feed begins to be given in the grower phase. The samples collected were digestive tract organs, which were then measured for the length, weight and pH of the digesta. Small intestine samples from the jejunum were also analyzed for histomorphology of intestinal villi and tight junction gene expression. The data obtained were analyzed for variance with one-way pattern and if there were differences, it was continued with the Duncan's Multiple Range Test. Based on the analysis results, it is known that the substitution of CPO with saponified BSF-L oil in a ratio of 3:0 produces the best performance and produces the highest duodenal length. CPO substitution with a ratio of 2:1 produced a higher ileum pH value than other treatments and at a ratio of 0:3 produced the highest expression of tight junction genes, but the substitution did not have a negative effect on the relative weight of the digestive organs and the histomorphology of the villi of the jejunum. Based on this research, it can be concluded that substitution of CPO with saponified BSF-L oil in a ratio of 3:0 produces the best performance. Substitution of CPO with saponified BSF-L oil can be used in broiler chicken feed up to a ratio of 2:1.

Key words: saponified BSF-L oil, performance of broiler chickens, digestive tract characteristics, tight junctions