PENGARUH MINYAK *BLACK SOLDIER FLY LARVAE* TERSAPONIFIKASI KALSIUM TERHADAP PERFORMA PERTUMBUHAN, PROFIL BIOKIMIA DARAH, KUALITAS DAGING DAN EKSPRESI GEN METABOLISME LEMAK PADA AYAM BROILER

INTISARI

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Penelitian ini bertujuan untuk mengetahui pengaruh penambahan minyak *black soldier fly larvae* tersaponifikasi kalsium (BSFL-SCa) dalam pakan ayam broiler terhadap performa pertumbuhan, profil biokimia darah, kualitas daging dan ekspresi gen metabolisme lemak pada ayam broiler. Penelitian ini dilaksanakan dalam 2 tahap, yaitu: tahap pertama berupa pembuatan BSFL-SCa, analisis profil asam lemak minyak BSF-L dan BSFL-SCa dan uji in vitro kecernaan BSFL-SCa pada non-ruminansia. Tahap kedua yaitu pengujian secara in vivo BSFL-SCa pada 280 ekor *day old chickens* jantan broiler dengan empat perlakuan yaitu pakan basal (kontrol) dan pakan basal ditambah dengan 1%, 2%, dan 3% BSFL-SCa. Setiap perlakuan terdiri dari 7 *flock* dengan masing-masing 10 ekor ayam. Pemeliharaan dilakukan selama 35 hari dengan pakan dan minum *adlibitum*. Selama pemeliharaan dilakukan pengambilan data performan meliputi konsumsi pakan, pertambahan bobot badan, konversi pakan, bobot badan akhir, indeks performa dan mortalitas. Pada akhir pemeliharaan 1 ekor ayam tiap *flock* disembelih, darah ditampung untuk diuji profil biokimia darah meliputi kadar trigliserida, kolesterol, HDL, LDL, protein, albumin dan glukosa. Selain itu, diuji pada karakteristik karkas meliputi bobot potong, berat karkas, berat daging dada dan paha, lemak abdominal, kualitas kimia daging meliputi kadar air, abu, protein kasar, lemak kasar dan kolesterol serta kualitas fisik daging meliputi nilai susut masak, daya ikat air, keempukan, dan warna. Pengujian ekspresi gen metabolisme lemak pada hati dilakukan terhadap gen FAS, ACC, CPT 1 dan HMGR. Data yang diperoleh dari penelitian dianalisis variansi mengikuti Rancangan Acak Lengkap dengan pola searah. Apabila terdapat indikasi perbedaan nyata selanjutnya data diuji lanjut menggunakan uji DMRT. Hasil penelitian menunjukkan bahwa penambahan BSFL-SCa sebesar 1% menurunkan kandungan lemak abdominal dan lemak kasar daging serta ekspresi gen pada sintesis lemak (FAS,ACC) sedangkan pada parameter lainnya tidak terpengaruh. Penambahan mulai sebesar 2% dapat menurunkan performa, karakteristik karkas, kolesterol dan susut masak daging serta meningkatkan HDL, protein darah, albumin darah, protein kasar, daya ikat air, nilai a* dan b* daging dan ekspresi gen pada oksidasi lemak (CPT-1). Kesimpulan yang diambil dari penelitian ini yaitu penggunaan BSFL-SCa sebesar 1% menurunkan perlemakan pada daging broiler tanpa berbengaruh negatif terhadap performa dan karakteristik karkas.

Kata kunci: ayam broiler, minyak BSF-L, sabun kalsium, performa pertumbuhan, kualitas daging, ekspresi gen.

EFFECT OF BLACK SOLDIER FLY LARVAE OIL CALCIUM SAPONIFIED ON GROWTH PERFORMANCE, BLOOD BIOCHEMICAL PROFILE, MEAT QUALITY, AND FAT METABOLISM GENE EXPRESSION IN BROILER CHICKEN

ABSTRACT

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This study aimed to determine the effect of black soldier fly larvae oil calcium saponified (BSFL-SCa) in broiler feed on growth performance, blood biochemical profile, meat quality, and fat metabolism gene expression in broiler chickens. This research was carried out in 2 stages: the first stage was the preparation of BSFL-SCa, analysis of the fatty acid profiles of BSF-L and BSFL-SCa oils, and in vitro digestibility analysis of BSFL-SCa in non-ruminants. The second stage was in vivo analysis of BSFL-SCa on 280-day-old chick male broiler chickens with four treatments: basal feed (control) and basal feed supplemented with 1%, 2%, and 3% BSFL-SCa. Each treatment consisted of 7 flocks with 10 chickens in each flock. Chicks were reared for 35 days with adlibitum of feed and drink. During reared, performance data were collected, including feed consumption, body weight gain, feed conversion, final body weight, performance index, and mortality. At the end of reared, one chicken per flock was slaughtered. Blood was collected to be analyzed for blood biochemical profiles, including the concentration of triglycerides, cholesterol, HDL, LDL, protein, albumin, and glucose. Moreover, it was analyzed on carcass characteristics, including slaughter weight, carcass weight, breast and thigh meat weight, abdominal fat, and meat chemical quality, including water content, ash, crude protein, crude fat, and cholesterol. Meat physical quality, including cooking loss, water holding capacity, tenderness, and color. Fat metabolism gene expression analysis in the liver was conducted on the FAS, ACC, CPT 1, and HMGR. The data obtained from the study were analyzed for variance using a completely random design. If there were differences between means, followed by further testing using the DMRT test. The results showed that adding 1% of BSFL-SCa reduced the content of abdominal fat and crude fat in meat and the expression of genes on fat synthesis (FAS, ACC), while other parameters were unaffected. The addition of 2% or more reduced performance, carcass characteristics, meat cholesterol and meat cooking loss. In addition, increased HDL, protein and albumin of blood crude protein, water holding capacity, a* and b* values of meat, and gene expression in fat oxidation (CPT-1). The conclusion drawn from this study is that using 1% BSFL-SCa reduces fattening in broiler meat without negatively affect carcass performance and characteristics.

Keywords: broiler chicken, BSF-L oil, calcium soap, growth performance, meat quality, gene expression.