PENGARUH SUPLEMENTASI GLUKOMANAN PORANG (*Amorphophallus oncophyllus*) DAN *Bacillus subtilis* FNCC 0059 DALAM PAKAN TERHADAP MIKROBIOMA SEKUM, IMUNITAS, SERTA PERFORMAN AYAM BROILER

INTISARI

Penggunaan antibiotik untuk unggas telah dilarang di Indonesia sehingga diperlukan alternatif imbuhan pakan. Glukomanan porang (*Amorphophallus oncophyllus*) dan *Bacillus subtilis* FNCC 0059 berpotensi sebagai kandidat prebiotik dan probiotik untuk imbuhan pakan ayam. Tujuan dari penelitian ini adalah untuk mengevaluasi pengaruh suplementasi glukomanan porang dan *Bacillus subtilis* FNCC 0059 dalam pakan terhadap mikrobioma sekum, *potential Hydrogen* (pH), dan *short chain fatty acids* (SCFA) sekum *in vitro* dan *in vivo* serta imunitas dan performan *in vivo* pada ayam broiler. Penelitian ini dibagi menjadi dua tahap yaitu *in vitro* dan *in vivo*. Penelitian *in vitro* menggunakan inokulum larutan sekum selama 24 jam dengan suhu 37^{o}C dalam kondisi anaerob. Penelitian *in vivo* dilakukan pada *day old chicks* (DOC) broiler *strain Lohmann* MB-202 P jantan dan betina sebanyak 160 ekor yang dibagi dalam 4 perlakuan dan 4 ulangan (masing-masing 10 ekor) menggunakan rancangan acak lengkap (RAL) dengan masa pemeliharaan 35 hari. Perlakuan yang diuji *in vitro* dan *in vivo* adalah T0 (kontrol pakan basal), T1 (pakan basal + glukomanan porang), T2 (pakan basal + *Bacillus subtilis* FNCC 0059), dan T3 (pakan basal + glukomanan porang + *Bacillus subtilis* FNCC 0059). Variabel terikat penelitian *in vitro* meliputi mikrobioma, pH, dan SCFA, sedangkan *in vivo* berupa mikrobioma, pH, SCFA, imunitas (bobot relatif organ limfoid, profil darah), dan performan (morfologi usus, bobot badan, pertambahan bobot badan (PBB), konsumsi pakan, konversi pakan, dan mortalitas). Hasil menunjukkan bahwa perlakuan T3 mampu meningkatkan bakteri *Enterococcus*, *Streptococcus*, *Bifidobacterium*, *Turicibacter*, *Butyrivibrio, Gallicola, Blautia, Butyricoccus, Faecalibacterium, unidentified Lachnospiraceae, Roseburia, Bacteroides, unidentified Ruminococcae* dan SCFA serta menurunkan pH *in vitro*. Sedangkan pada penelitian *in vivo* perlakuan T3 mampu meningkatkan persentase genus *Gallicola* yang merupakan bakteri penghasil SCFA dan imunitas dilihat dari bobot relatif bursa fabrisius dan timus dan rasio heterofil/limfosit. Performan broiler pada perlakuan T3 lebih tinggi dibanding kontrol. Hal tersebut dapat disimpulkan bahwa suplementasi sinbiotik glukomanan porang dan *Bacillus subtilis* FNCC 0059 dalam pakan mampu mengoptimalkan mikrobioma sekum *in vitro* maupun *in vivo* dan meningkatkan imunitas serta performan ayam broiler dibandingkan dengan kontrol *in vivo*.

Kata Kunci: ayam broiler, *Bacillus subtilis* FNCC 0059, glukomanan porang, imunitas, mikrobioma, performan

SUPPLEMENTATION EFFECT OF PORANG (*Amorphophallus oncophylus*) GLUCOMANNAN AND *Bacillus subtilis* FNCC 0059 IN FEED ON CAECUM MICROBIOME, IMMUNITY, AND PERFORMANCE OF BROILER CHICKENS

ABSTRACT

The use of antibiotics for poultry had been banned in Indonesia so an alternative feed additive was needed. Porang glucomannan (*Amorphophallus oncophyllus*) and *Bacillus subtilis* FNCC 0059 had potential as prebiotic and probiotic candidates to be feed additives for chicken. The purpose of this study was to evaluate the supplementation effect of porang glucomannan and *Bacillus subtilis* FNCC 0059 on caecum microbiome, potential Hydrogen (pH), and short chain fatty acids (SCFA) caecum *in vitro* and *in vivo* and also immunity and performance of broiler chickens *in vivo*. The study was divided into two stages, *in vitro* and *in vivo*. *In vitro* used solution of the caecum as inoculum for 24 hours at 37^{o}C under anaerobic condition. The *in vivo* study was conducted on 160 unsex day old chicks (DOC) broiler strain *Lohmann* MB-202 P which were divided into 4 treatments and 4 replications (10 birds each) using a completely randomized design (CRD) with raising period of 35 days. The treatments tested *in vitro* and *in vivo* were T0 (basal diet control), T1 (basal diet + porang glucomannan), T2 (basal diet + *Bacillus subtilis* FNCC 0059), and T3 (basal diet + porang glucomannan + *Bacillus subtilis* FNCC 0059). *In vitro* parameters were consisted of microbiome, pH, and SCFA, while *in vivo* were microbiome, pH, SCFA, immunity (relative weight of lymphoid organs, blood profile), and performance (intestinal morphology, body weight, body weight gain, feed intake, feed conversion, and mortality). The results showed that the T3 treatment was able to increase *Enterococcus, Streptococcus, Bifidobacterium, Turicibacter, Butyrivibrio, Gallicola, Blautia, Butyricoccus, Faecalibacterium, unidentified Lachnospiraceae, Roseburia, Bacteroides, unidentified Ruminococcae*, and SCFA, reduce pH *in vitro*. Meanwhile, in *in vivo* study, T3 treatment was able to increase the percentage of genus *Gallicola* which was bacteria that could produce SCFA and immunity as seen from relative weights of bursa fabrisius and thymus and ratio of heterophile/lymphocyte. Broiler performance in T3 treatment was higher than control. It could be concluded that the synbiotic supplementation of porang glucomannan and *Bacillus subtilis* FNCC 0059 in feed was able to optimize caecum microbiome *in vitro* and *in vivo* and improve immunity and performance of broiler chickens than control *in vivo*.

Keywords: *Bacillus subtilis* FNCC 0059, broiler chicken, immunity, microbiome, performance, porang glucomannan