

## **KEBUTUHAN NON-PHYTATE PHOSPHORUS AYAM BROILER FASE STARTER DENGAN ATAU TANPA PENAMBAHAN FITASE**

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### **INTISARI**

Penelitian ini bertujuan untuk mengetahui kebutuhan *non-phytate phosphorus* (NPP) dengan atau tanpa penambahan enzim fitase untuk ayam broiler fase *starter*. Penelitian dilaksanakan selama 21 hari menggunakan 2000 ekor ayam broiler (1000 ekor jantan dan 1000 ekor betina), dengan 10 macam perlakuan pakan. Pakan perlakuan P1-P5 berupa pakan basal dengan penambahan 0,90% Ca dan penambahan NPP dengan level yang berbeda, yaitu: 0,420% (P1); 0,345% (P2); 0,270% (P3); 0,195% (P4); dan 0,120% (P5). Pakan perlakuan P6-P10 berupa pakan basal dengan penambahan 0,67% Ca dan 60 FTU enzim fitase dengan kandungan NPP yang berbeda, yaitu: 0,420% (P6); 0,345% (P7); 0,270% (P8); 0,195% (P9); dan 0,120% (P10). Pakan basal disusun berbasis jagung-bungkil kedelai dengan kandungan kalsium (Ca) 0,097% dan fosfor (P) 0,124%. Parameter yang diamati meliputi: kinerja pertumbuhan, efisiensi pakan, dan mineralisasi tulang, berdasarkan periode umur pemeliharaan 1-10 hari; 11-21 hari; dan *overall* 1-21 hari. Data yang diperoleh dianalisis variansi menggunakan Rancangan Acak Lengkap pola searah dan dilanjutkan dengan Duncan's new Multiple Range Test untuk data yang berbeda nyata. Pengukuran respon penurunan fosfor dengan atau tanpa penambahan enzim fitase terhadap rata-rata bobot badan dan kadar abu *tibia* dan *toe* dilanjutkan dengan pembentukan grafik persamaan kuadrat:  $y = ax^2 + bx + c$ . Penentuan kebutuhan fosfor dengan atau tanpa penambahan enzim fitase terhadap rata-rata bobot badan, melalui 95% dari respon maksimum. Penentuan respon maksimum ditetapkan melalui grafik  $y_{maks} = -b/2a$ . Hasil penelitian menunjukkan bahwa penurunan fosfor pada pakan basal tanpa suplementasi fitase tidak mempengaruhi tingkat konversi pakan (FCR), namun menurunkan ( $P < 0,05$ ) konsumsi pakan, penambahan bobot badan, rata-rata bobot badan, ( $P < 0,05$ ), serta menaikkan angka kematian ayam ( $P < 0,05$ ) pada keseluruhan periode umur pemeliharaan. Hasil penelitian juga menunjukkan bahwa penurunan fosfor pada pakan basal dengan suplementasi enzim fitase tidak mempengaruhi FCR dan angka kematian, namun menurunkan ( $P < 0,05$ ) konsumsi pakan, penambahan bobot badan, dan rata-rata bobot badan ayam pada semua periode pemeliharaan. Estimasi kebutuhan dengan penambahan NPP tanpa enzim fitase yaitu 0,972% dan 0,983% pada 1 s.d. 21 hari terhadap kadar abu *tibia* dan *toe*, serta estimasi kebutuhan dengan penambahan NPP dengan enzim fitase yaitu 0,990% terhadap kadar abu *toe*. Dapat disimpulkan bahwa penurunan kandungan mineral kalsium dan fosfor dalam pakan dapat menurunkan kinerja pertumbuhan dan proses mineralisasi tulang, namun ternak dapat lebih toleran ketika fitase ditambahkan dengan dosis yang tepat di dalam pakannya.

Kata kunci: Ayam broiler, Enzim fitase, Kebutuhan kalsium-fosfor, Kinerja pertumbuhan, Mineralisasi tulang

## **NON-PHYTATE PHOSPHORUS REQUIREMENTS IN STARTER PHASE OF BROILER CHICKENS WITH OR WITHOUT PHYTASE SUPPLEMENTATION**

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### **ABSTRACT**

This study was aimed to observe the requirements of non-phytate phosphorus (NPP) with or without phytase supplementation in starter phase of broiler chickens. A total number of 2000 broiler chickens (1000 males and 1000 females) were divided into two experiments in 10 treatments for 21 days rearing period. The first 5 treatment diets (P1-P5) were the basal diets with 0.90% calcium (Ca) that combined with NPP at different levels, i.e.: 0.420% (P1); 0.345% (P2); 0.270% (P3); 0.195% (P4); 0.120% (P5). Whereas, the second 5 treatments diets (P6-P10) were basal diets with 0.67% Ca and 60 FTU phytase, combined with NPP at different levels, i.e.: 0.420% (P6); 0.345% (P7); 0.270% (P8); 0.195% (P9); 0.120% (P10). The basal diet was a corn-soybean based diet that contained 0.097% Ca and 0.124% P. Response variables that observed were growth performance, feed efficiency, and bone mineralization, which based on 1-10 days, 11-21 days, and overall 1-21 days rearing periods. The data were subjected to a One-way ANOVA using Complete Randomized Design, continued with Duncan's new Multiple Range Test for all data with significant difference. Measurement of responses due to the reduction of NPP supplementation on average body weight, tibia ash and toe ash were then followed subsequently by generating equation for quadratic curve  $y = ax^2 + bx + c$  to determinate NPP requirement. Determination of the maximum response was done through  $y_{maks} = -b/2a$ . Results showed that reduction of dietary phosphorus addition without phytase supplementation did not affect feed conversion ratio, but reduced ( $P < 0.05$ ) feed consumption, average daily gain, average body weight, and mortality. It has been showed that reduction of dietary P addition on basal diets with phytase supplementation did not affect FCR and mortality, but reduced ( $P < 0.05$ ) feed consumption, average daily gain, average body weight in all rearing periods. Based on tibia and toe ash content, estimation of NPP requirement without phytase supplementation were 0.972% (tibia) and 0.983 (toe) for the 1-21 days rearing periods. Whereas, estimation with phytase supplementation was 0.990% (toe) for the 1-21 days rearing period. It could be concluded that reduction of minerals Calcium and Phosphorus contents in the diets might reduce growth performance and bone mineralization process. However, broiler chickens might be more tolerant when the diets were supplemented with proper level of phytase.

Keynote: Bone mineralization, Broiler chickens, Growth performance, Calcium-Phosphorus requirements, Phytase enzyme