STUDIES ON CALCIUM FOR FEEDING BROILERS

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ABSTRACT

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Three experiments were conducted in this study:

In Experiment I Different sources of limestone (white, grey or yellow) were used to determine their effects on the growth performance and bone characteristics of broiler chicks fed on a corn soya diets.

Experiment II was design to study the effect of the same limestone sources used in experiment 1 on the performance and bone characteristics of broiler chicks on dites containing an animal protein sources along with a corn soya diets.

Experiment III was conducted to study the effect of different particle sizes (0.125, 0.5 and 1.0mm) of white limestone on the performance and bone characteristics of broiler chicks fed on diets containing an animal protein sources .

The main results of this study could be summarized as follows:

Experiment I :

Different limestone sources (white, grey or Yellow) showed that, there were no significant differences among treatments on chick performance at 7 wks of age. Tibia break force

increased significantly ($p < 0.05$) for chicks received grey limestone.

There were no significant differences in plasma calcium concentration, while plasma phosphorus concentration was significant lower ($p < 0.5$) at 7 wks age for brids received yellow limestone than the other tow sources there were no significant differenses in carcass characteristics among the different limestone sources.

Experiment II

-No significant differences were detected in body weight and body weight gain among broiler chicks received diets containing white, grey or yellow limestone .

-Feed intake of birds fed on diet containing yellow limestone was significantly ($p < 0.05$) higher than those received the white limestone diet.

-The best feed conversion ratio was recorded for chicks fed on a diet containing white limestone.

-Grey or yellow limestone diets significantly improved ($p < 0.05$) the tibia break force (kg / Cm).

-No significant differences were observed in plasma calcium or phosphorus levels among the experimental groups.

-White, grey or yellow limestone had no significant ($p < 0.05$) effect on carcass characteristics.

Experiment III

-The body weight and body weight gains of chicks fed on diets contain 1.0 mm white limestone particle size were significantly ($p > 0.05$) heigher than those of the other lower particle size (0.125 or 0.5mm).

-Chicks fed on diets containing limestone with 0.5 or 1.0 mm particle size consumed significantly ($p < 0.05$) higher feed intake than that of 0.125 mm particle size diet.
-The best feed conversion ratio was recorded for chicks received white limestone with 0. 125 and 1.0 mm particle size. Than the medium size of 0.5 mm.
-Tibia break force improved significantly ($p < 0.05$) by white limestone of 0.5 or 1.0 mm particle size.
-No significant effects were observed on plasma calcium or phosphorus levels by different white limestone particle size.
-No significant effects were obtained for carcass characteristics of broiler chicks received diets containing defferent limestone particle size.

Key word: Calcium, limestone sources, particle size, Broilers, nutrition, Tibia.

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INTRODUCTION

Calcium and phosphorus requirements of broiler chickens have been researched in the past 30 years ago, especially in the young chicks.

Calcium is one of the essential inorganic elements in poultry diet. The major portion of calcium in the grower diets is used for bone formation, however, more calcium in layer diet is required for egg shell. Calcium is essential for blood clotting and is required along with sodium and potassium for maintaining normal heart function. Calcium is found in the chickens blood as well as in other animals in three forms: A) Bound to plasma protein B) bound to in organic compounds C) freely dissociated or ionized.

A large variety of calcium sources are available for application in the feed industry. Hover, one of the most plentiful sources of supplemental calcium is some form of limestone, the widespread sedimentary rocks containing the fossils of marine animals from ancient seas.

Feed grade limestone can be a broadly defined term as it may include limestone with a calcium content of 30-40% calcium.

Following the American terminology, a limestone source which is high in calcium (38-40%) is referred to as calcium carbonate. A 33-37% calcium limestone source is called ground limestone. However, this name bears no reference to the material’s particle size. Feed grade limestone products of different particle sizes (5-1180 um) are equally effective in supplying calcium, and influencing poultry performance.

However, in the case of laying hens, large particles (1400-5600 um) of limestone or oyster shell appear to be more effective than smaller granulation’s in producing eggs with acceptable shell strength.