



The effects of diets containing low calcium and low available phosphorus levels on apparent digestibility of Ca & P and bone mineralization of broiler chickens

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Objectives: Adaptation of birds to diets deficient in some nutrients has been well recognized during the history. Studies have revealed that animals that oppose deficiencies in nutrients try to absorb these nutrients efficiently which causes reductions in their excretion to the improvement. This study aims to investigate the effects of lowered levels of calcium and available phosphorous on the performance of broiler and determining the minimum level of those minerals to reduce their excretion to the environment.

Materials & Methods: A total of 540 broiler chickens (Arbor Acres Plus) were used in a 3×3 factorial completely randomized design with 4 replicates. Broiler chickens were fed three levels of dietary calcium (NRC recommended level, 80% or 60% of NRC recommended level) and three levels of phosphorus (NRC recommended level, 80% or 60% of NRC recommended level) during 7- 45 days of age. In 28 day of age, tibia from left leg of 8 birds in each treatment was removed and analyzed for ash content. To determine the apparent digestibility of calcium and phosphorous in 42 days of age, excreta were collected for 3 executive days in 4 birds in each treatment which kept in individual cages.

Results & Conclusion: Results showed that reducing dietary calcium to levels below NRC (1994) recommended values resulted in increased apparent calcium digestibility ($P<0.05$) but the ash content of bones was not affected. Decreasing available phosphorous in the diet to level lower than NRC (1994) recommendation increased its apparent digestibility and decreased ash content of the bone ($P<0.05$). Interaction of calcium and available phosphorus levels had a significant effect on tibia ash and apparent digestibility of Ca and P ($P<0.05$). It can be concluded, based on the results of this experiment, that calcium levels recommended by NRC (1994) for modern broiler chicks causes the excretion of excess calcium, but the NRC (1994) recommended levels of phosphorous seems adequate for maintaining desirable ash content of bone.

Keywords: Calcium, Available Phosphorus, Apparent Digestibility, Bone Ash, Broiler Chicken