

Modeling the growth of broilers and the metabolic fate of calcium and phosphorus

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Understand the response of broilers to a given nutrient allows to elaborate dynamic feeding programs, increase sustainability, and meet the objectives of a poultry farm. The modeling approach could be a valuable tool for better understanding a poultry system and predicting the animal responses to a given set of inputs. In this context, the broiler growth model (BGM) was first developed to predict the requirement of energy, amino acids, growth, and feed intake of broilers; however, there is still a necessity to include the minerals calcium (Ca) and phosphorus (P) in the model. These minerals are related to essential functions on animal metabolism, such as bone formation, plasmatic membranes, and energetic metabolism. Furthermore, Ca and P are closely related, which means that the deficiency or excess of one may interfere with the utilization of the other, denoting a necessity to account for such interaction. A comprehensive view of Ca and P metabolic fate on broilers metabolism was proposed at the Université Laval in collaboration with INRAe. Then, as a result of a collaboration between ULaval and UNESP, a representation of the Ca and P system was implemented to the BGM, allowing to predict the absorption, excretion, and the dynamics of Ca and P on body metabolism, including predictions on deposition/mobilization of Ca and P into bone. This research model is evolving to a prediction one to precisely assessed P and Ca requirement in the near future.

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