The use of digestible phosphorus to formulate broiler's diet enhances animal performance and bone mineralization.

Knowledge grows

Introduction

Absorption of phosphorus from inorganic feed phosphates by poultry is driven by their chemical form and quality.

Despite its impact on animal performance, farm economy and environment, there is a lack of consensus on the best methodology to measure phosphorus absorption.

The choice of the most absorbable (or digestible phosphorus) feed phosphate source and the use of proper absorbability coefficients is crucial to maximize farm profitability and minimize the environmental impact of mineral phosphates.

The objective of this study was compare two systems to measure phosphorus availability. For this purpose, diets that differed in the inorganic feed phosphate source, but similar in either (1) Dietary non phytate phosphorus (nPP) (2) Calculated pre-caecal digestible phosphorus (according to CVB 2016) were formulated and their impact on broiler performance and bone mineralization were evaluated.

Methods

The three following dietary treatments were compared in a randomized complete block design with 10 replicates of 10 Ross x Ross 308 broilers per treatment.

DCP	BOLIFOR® MCP	dMCP†
nPP = 0.22%	nPP = 0.22%	nPP = 0.20%
Ca:P = 1.4:1	Ca:P = 1.4:1	Ca:P = 1.4:1
Dose*: 0.50%	Dose*: 0.40%	Dose*: 0.30%

DCP: Dicalcium phosphate, MCP: BOLIFOR® Monocaclium phosphate
† Digestible MCP (BOLIFOR® Monocalcium phosphate). * Inclusion level of the feed phosphate.

All diets contained phytase and were formulated to nPP levels below requirement to best demonstrate treatment differences. Body weight per pen and feed intake were recorded on d7,d14 and d21. Tibia mineralization was measured on d21.

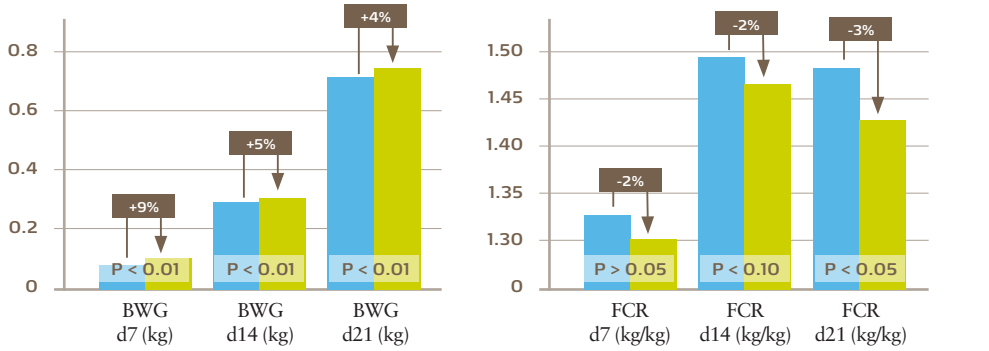
Linear contrasts were utilized to compare treatments of interest:

Contrast 1: MCP vs DCP: Similar dietary nPP

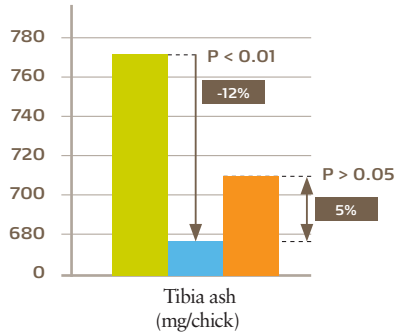
Contrast 2: DCP vs dMCP: Similar pre-caecal digestible phosphorus

Results

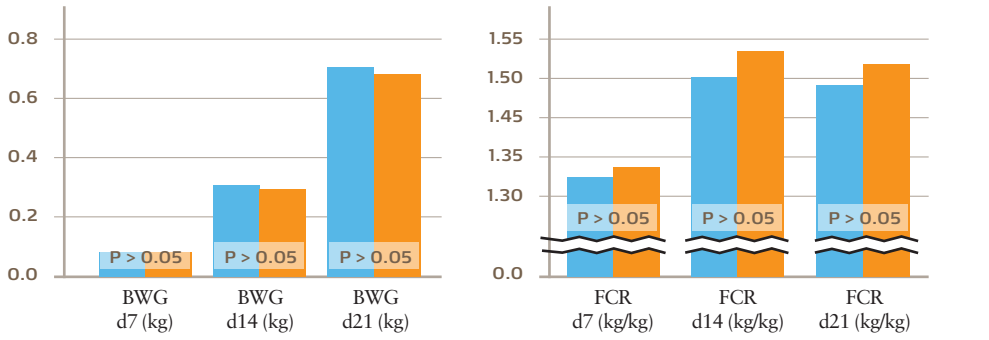
Contrast 1: Similar nPP, DCP vs BOLIFOR® MCP, within each, d7, d14 and d21



Tibia mineralization at d21 for DCP, BOLIFOR® MCP and dMCP



Contrast 2: Similar calculated dietary digestible phosphorus, DCP vs dMCP, within each, d7, d14 and d21.



DCP
Bolifor® MCP
dMCP

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Conclusions

Broiler performance is clearly affected by the source of inorganic feed phosphate in the diet when diets are formulated to similar nPP, as well as total inorganic feed phosphate content.

Diets formulated using calculated dietary pre-caecal digestible phosphorus contribute to maximize inorganic phosphate utilization.

Proper comparison of inorganic phosphates should take into account both phosphorus content and pre-caecal digestibility.

QUALITY FEED PHOSPHATES