

Effects of dietary oil sources and calcium: phosphorus levels on growth performance, gut morphology and apparent digestibility of broiler chickens

ABSTRACT

The study investigated the effects of varying dietary calcium (Ca) levels and sources of oil on performance of broiler chickens. A total of 378 one-day-old birds were fed 6% palm oil (PO), soybean oil (SO) or linseed oil (LO) in combination with three levels of Ca, 1%, 1.25% and 1.5%, for six weeks in a 3 x 3 factorial experiment. Birds fed diet supplemented with SO and PO had higher average daily gains, more abdominal fat and greater villi height compared with those fed LO. However, feed efficiency, apparent digestibility of organic matter, ether extract, crude protein and ash were similar across treatments. Regardless of oil source, the chickens fed diets containing 1.5% Ca had a lower bodyweight and apparent digestibility of organic matter, crude protein, ether extract and phosphorus (P) than those fed 1% and 1.25% Ca. In contrast, the birds fed 1.25% Ca had higher ash, Ca and P digestibility than did the 1% Ca birds. Interaction between source of oil and Ca level on mineral digestibility was significant. It can be concluded that palm oil could be used as an alternative to soybean and linseed oils to improve growth performance in broiler chickens. Moreover, increasing the level of Ca to 1.25% can improve broiler performance and apparent nutrient digestibility, regardless of the type of oil used in the current study.

Keyword: Broiler performance; Dietary calcium levels; Linseed oil; Nutrient digestibility; Palm oil; Soybean oil; Villus height