

## **True P digestibility of corn, SBM and corn-soybean meal without and with phytase in broilers**

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The objective of the current study was to evaluate the true ileal P digestibility (TIPD) of corn, SBM, and corn soy based diet (C-SBM) as affected by phytase supplementation using a regression approach in broilers. A total of 800 Ross 308 male broiler chicks were fed a complete common corn-SBM-based diet from d 1 to d 15. From d 15 to 23, birds were fed 18 experimental diets. Three inclusion rates were provided for corn (22, 46 and 72%), SBM (40, 51 and 62%) and C-SBM (21/10, 42/21 and 63/31% of a combination of corn/SBM) supplemented without or with 500 U of phytase/kg diet (CIBENZA® PHYTAVERSE®, Novus International, Inc., St Charles, MO). Corn diets contained 0.7% Na-phosphate and all diets had a Ca:P ratio between 1.3-1.5:1 following WPSA (2013) guidelines. C-SBM diets contained 0.91% dicalcium phosphate to mimic commercial diets. Each treatment had 8 replicate cages (5 birds/cage). Digesta from the posterior 2/3rd of the ileum was collected on d 23. Data were analyzed by 2-way ANOVA to evaluate the effect of ingredient level, phytase and their interaction, and by orthogonal polynomial contrasts to test the linear and quadratic effects of ingredient level. TIPD estimates were obtained by regressing P output against dietary P content. TIPD estimate of SBM (52.0%) is more reasonable than the extremely low values obtained for corn (-7.2%) and C-SBM (5.6%). Corn and C-SBM contained inorganic P, whereas SBM diets contained no inorganic P. Phytase improved TIPD in corn (+38 points, to 60.4%;  $P < 0.01$ ) and C-SBM (+14 points, to 19.5%;  $P = 0.02$ ), however it did not in SBM (+7 points, to 59.9%;  $P = 0.55$ ). Apparent ileal P digestibility (AIPD) tended to decrease linearly ( $P < 0.08$ ) as corn and SBM levels increased, and increased when phytase was supplemented. A significant ingredient level  $\times$  phytase interaction was found for AIPD in corn-SBM ( $P < 0.01$ ). Phytase improved AIPD at all ingredient levels, however the response of ingredient level in diets without phytase (low, med, high: 76.2b, 54.7d, 45.7e%) was quadratic and linear for diets with phytase (low, med, high: 88.1a, 76.7b, 60.0c%). In summary, TIPD estimates for SBM and for corn and C-SBM obtained by regression are lower than AIPD and far from reality possibly due to the use of fixed Ca:P ratio and of inorganic P in corn and C-SBM diets. Phytase efficiently improved TIPD and AIPD in corn and C-SBM, and AIPD in SBM.

**Keywords:** Corn, Soybean meal, phytase, digestibility, phosphorus.