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A new bacterial phytase can act as an overdose concept, at low levels, in improving the performance and carcass characteristics of nursery and finishing pigs

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This study aimed to evaluate the effect of doses of a new bacterial phytase (HiPhorius, DSM Nutritional Products) on the performance and carcass characteristics of pigs in the nursery and finishing phases. 250 barrows and gilts, 21 d-old and  $6.07 \pm 0.73$  kg of initial weight were randomized in blocks design and submitted to 5 treatments. The pigs were fed five corn-soybean meal-based diets: positive control (PC), supplemented with inorganic phosphorus and calcium; negative control (NC), with 0.18% reduction in available phosphorus and 0.16% in calcium; and three NC diets supplemented with 600, 1,200 and 1,800 phytase units (FYT)/kg in the feed. Daily weight gain (DWG), daily feed intake (DFI), feed conversion rate (FCR), and live weight (LW) were measured at the end of each phase: pre-starter I (21-28d), pre-starter II (28-35d), starter I (35-49d), starter II (49-63d), growing I (63-91d), growing II (91-112d), finishing I (112-133d) and finishing II (133-156d) phases. Carcass yield, back fat height, loin depth, and lean meat yield were measured in the 156 d-old. Data were submitted to ANOVA, Tukey test and regression analysis. In the nursery (21-63d) diets with phytase levels were similar to PC for FCR ( $P > 0.05$ ) and better to NC, with a quadratic effect ( $FCR = 1.671 - 0.0003X + 0.00000010526X^2$ ), being the best point 1,320 (FYT). The supplementation with phytase in grow-finishing phases (63-156d) were similar to PC ( $P > 0.05$ ) for DWG, DFI and FCR ( $P < 0.05$ ) and better than NC, which were identified a regression effect ( $DWG = 0.8543 + 0.0001X$ ;  $DFI = 2.1453 + 0.0007X - 0.00000029618X^2$ ;  $FCR = 2.6924 - 0.0004X + 0.00000012768X^2$ ), with the best levels of phytase of 1,296 and 1,404 FYT for DFI and FCR, respectively. The supplementation of phytase improve the carcass yield, loin depth, kilogram of lean meat and percentage of lean meat when compared to NC diet. Supplementing levels of HiPhorius to a corn and soybean meal-based diet with inorganic P and Ca reduction improved performance and carcass traits of pigs after weaning until slaughter age.

**Keywords:** enzyme, minerals, super-dosing phytase, weaner.