The effect of dacitic tuff breccia alone or in combination with poultry by-products on nursery pig’s growth performance

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Introduction

Trace elements and mineral intake are important for immune system function and various systemic metabolic processes. Dacitic (rhyolitic) tuff breccia (DTB) is a natural, highly mineralized complex silica ore of solidified volcanic igneous rock origination. Comprised of a large portion of non-crystalline & crystalline composites described as a vitric, poorly welded tuff. This experiment was conducted to evaluate pig growth performance when fed diets containing DTB alone or in combination with poultry by-products (PBP).

Materials and Methods

Newly weaned pigs (N=564, 20.1d of age, 6.2±0.01 kg initial BW) were utilized for 35d in a randomized complete block design study (15 rep/trt; 9 or 10 pigs/pen), based on BW and sex, and allotted to 1 of 4 diets:
1. Negative control (NC; no DTB or PBP)
2. NC+DTB (0.50% inclusion).
3. NC+PBP (4% chicken by-product meal +2% feather meal – replacing fishmeal, corn, & synthetic AA in NC)
4. NC+DTB+PBP

All diets contained pharmacological levels of either Zn or Cu. Phase 1-3 were each 7d and Phase 4 was from d21-35.

Data were analyzed using GLM procedure in SAS as a 2 x 2 factorial RCB design

Results and discussion

A 4 - 5% numerical increase in ADFI and ADG in week one post-weaning increased to a significant 7-8% increase in ADFI (P=0.039) and ADG (P=0.034) when pigs were fed DTB in week 2. In week 2, pigs fed PBP tended to have increased ADG (P=0.093).

In week 3 pigs fed PBP had reduced ADG (P=0.011) and G:F (P<0.001), and there tended to be an interaction for G:F (P=0.083) with DTB improving G:F when fed in combination with PBP but reducing G:F in the NC diet.

In week 4, feeding PBP decreased ADG (P<0.01) and ADFI (P<0.01) which continued for Phase 4 (d 21-35) with decreased ADG (P=0.041) and a tendency for reduced ADFI (P=0.092) compared to pigs fed no PBP.

Overall (d 0-35), there were no significant differences among treatments. However, during the first 3 weeks of the study pigs fed DTB had a shifted heavier BW distribution.

Conclusion

DTB improved nursery pig growth performance through day 14, however, it was not sustained. Pigs fed PBP had decreased growth performance in the late nursery period when PBP was a greater proportion of the proteins in the diet.