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Evaluating the addition of a *Bacillus*-based direct-fed microbial and/or carbadox to nursery pig diets on growth performance

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Objective

The objective of this trial was to evaluate the performance impacts of the addition of a particular combination of *Bacillus* strains to nursery pig diets with or without Carbadox.

Materials and Methods

The trial was conducted as a RCBD with seven replications per treatment. A total of 364 weaned pigs (approximately 21 days of age; mean body weight = 13.00 lb) were used in a 43-day trial utilizing 28 pens (13 pigs/pen). Pigs were allotted to one of four treatments based on initial body weight. Treatments were: 1) Four-phase nursery diet sequence containing no antibiotics; *Control*, 2) Four-phase nursery diet sequence containing Carbadox; *CX*, 3) As 1 with the addition of 1.0 lb/ton DFM; *DFM* 4) As 2 with the addition of 1.0 lb/ton DFM; *CX+DFM*. Carbadox was included at 50 g/ton in diet phases I, II, and III and 25 g/ton in phase IV. Treatments were isonitrogenous and isocaloric within diet phase. Diet phases I (pellet), II (pellet), III (meal), and IV (meal) were offered from day 0 to 7, 7 to 15, 15 to 28, and 28 to 43, respectively. Individual pig weights were obtained on days 0, 28, and 43 and pen weights were recorded on days 7, 15, and 21. Feed disappearance was measured on each weigh day to calculate ADFI and F/G. Pigs that were removed from test were weighed and reason for removal was recorded. Data were analyzed using GLM and ANOVA procedures.

Results

Pigs consuming the CX+DFM diets were significantly ($P < 0.05$) heavier on d 43 and had significantly ($P < 0.05$) greater gains from d 0 to 43 than pigs fed the other treatment feeds. Pigs consuming the CX and CX+DFM diets were significantly ($P < 0.05$) heavier on d 7 than pigs consuming the Control diet and pigs fed the CX+DFM diet tended ($P = 0.07$) to be heavier than pigs fed the DFM diet. Feed intake was significantly ($P < 0.05$) higher for pigs fed the CX+DFM diet from d 21 to 28 compared to all other treatment diets. From d 28 to 43 and 0 to 43, pigs consuming the CX+DFM diet had significantly ($P < 0.05$) higher feed intakes than pigs consuming the Control or DFM diets and had similar feed intakes to pigs fed the CX diet. Average daily gain from d 0 to 7 was significantly ($P < 0.05$) increased by the CX and CX+DFM diets compared to the Control diet. Pigs consuming the CX+DFM diet tended ($P = 0.07$) to have higher gains from d 0 to 7 than pigs fed the DFM diet. Pigs fed the CX diet tended ($P = 0.09$) to have the lowest daily gain from d 21 to 28. Pigs consuming the CX+DFM diet from 28 to 43 tended ($P = 0.09$) to have greater daily gains than pigs fed the Control or DFM diets. The CX+DFM diet improved ($P < 0.05$) feed/gain from d 0 to 7 compared to the Control or DFM diets. Feed/gain was also improved ($P < 0.05$) by the CX diet from d 0 to 7 compared to the Control diet.

Implications

This trial demonstrated that the addition of both this newly formulated *Bacillus*-based DFM and Carbadox can elicit an improvement in pig performance. Further research is warranted to determine how this combination of *Bacillus* strains will impact pig performance in the presence of various feed additives.

Summary of Nursery Pig Performance (Day 0-43)

	St.Wt.	End Wt.	ADFI	ADG	F/G
Control	13.00	52.71^{b}	1.321^{b}	0.923^{b}	1.429
CX	13.00	53.43^{b}	1.361^{ab}	0.940^{b}	1.446
DFM	13.00	52.77^{b}	1.327^{b}	0.925^{b}	1.433
CX + DFM	13.00	55.50^{a}	1.408^{a}	0.988^{a}	1.425

[a, b] Means lacking common superscripts differ $P < 0.05$.