

HOG-UPDATE

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Testing Antibiotic Free Starters

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Weaning exposes piglets to nutritional and environmental stresses that result in reduced feed intake, little or no weight gain, and in worst case – scours, morbidity and death.

The post-weaning growth performance lag is often managed by the use of sub-therapeutic levels of in-feed antibiotics. Since the Canadian Animal Health Institute has mandated phase out of medically important antibiotics for growth promotion, identifying alternative nutritional strategies for managing newly-weaned pigs is more important than ever.

Dietary organic acids or acidifiers are among the dietary strategies advantageous to transitioning piglets after weaning. Benzoic acid has been shown to be beneficial with respect to weaned pig's growth performance, nutrient digestibility and gut health. However, there is little information available on comparative efficacy of acidifiers and typical antibiotics used for growth promotion. Moreover, growth promoting mechanisms for antimicrobial growth promoters may be considerably different than proposed alternatives.

BSC cooperated in a recent trial completed by researchers at the University of Guelph to determine efficacy and economics of replacing antibiotics with organic acids. Three standard Corn-SBM diets were selected for feeding trial.

TRIAL COMPARISON – Three rations:

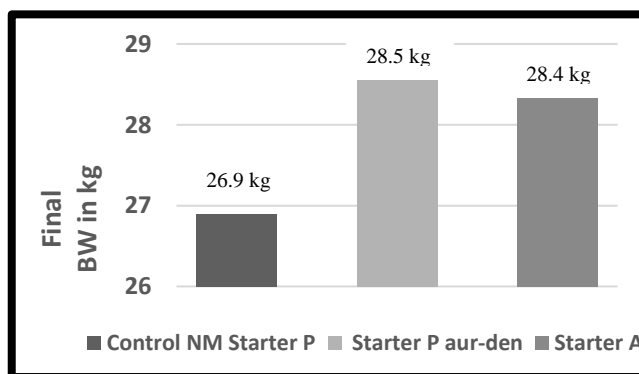
1. Control – non-medicated Starter P ration
2. Starter P medicated with:
220 ppm chlortetracycline hydrochloride (Aureomycin) and 31.2 ppm tiamulin (Denagard)
3. Starter A with organic acid

Average daily gain was greater for Starter P medicated, and tended to be higher for Starter A than for pigs fed the control diet of non-medicated Starter P. However, there was no statistical difference between medicated Starter P and Starter A.

Table 1. Average Daily Gain (ADG) response to supplemental organic and medicated starter (grams/day)

WEEK #	TREATMENTS:			<i>P-value below .05 means effect is considered significant</i>		
	1	2	3	1	1	2
	Control NM Starter P	Med. Starter P	Starter A	vs 2	vs 3	vs 3
1	22	64	47	.070	.276	.436
2	255	262	318	.806	.037	.061
3	493	528	545	.472	.150	.454
4	638	707	656	.047	.596	.130
5	737	792	773	.044	.182	.450
6	818	855	830	.192	.668	.372
1-6	494	533	528	.043	.075	.782

Figure 1: Body Weight Results for Starter Trial



Pigs fed a diet of Starter A and Starter P (medicated) both had statistically better feed conversion than the non-medicated control starter.

Table 2. Feed to Gain (F:G) response to supplemental organic acid and medicated starter

WEEK #	TREATMENTS:			<i>P-value below .05 means effect is considered significant</i>		
	1	2	3	1	1	2
	Control NM Starter P	Med. Starter P	Starter A	vs 2	vs 3	vs 3
1	4.80	3.67	1.14	.592	.092	.236
2	1.22	1.19	1.07	.609	.032	.089
3	1.46	1.54	1.34	.386	.231	.047
4	1.61	1.49	1.50	.014	.027	.767
5	1.68	1.61	1.60	.109	.085	.895
6	1.82	1.74	1.80	.162	.804	.244
1-6	1.64	1.58	1.54	.028	.001	.198

Indices of gut function and health

This study showed a significantly greater difference in villi height for Starter A compared to both medicated and non-medicated Starter P. The taller the villi the better the digestion. Organic acid improves gut function and protein digestion meaning the pathogens have less protein to ferment and cause gut health trouble.

Table 3. Comparative effects of supplemental organic and medicated starter on Villi height and crypt depth in

	Control NM Starter P	Medicated Starter P	Starter A	<i>P-value</i>
Villi height, 1/1000 mm	898.9	852.5	894.5	.018
Crude protein digestibility, %	72.84	74.58	78.33	.004

Table 4: Cost Analysis – Starter Phase

Corn - \$200 SBM - \$500	Control NM Starter P	Medicated Starter P	Starter A
Ration Cost / mt	\$384.75	\$398.05	\$404.23
Feed conversion (this trial)	1.64	1.58	1.54
Cost / kg gain	\$0.63	\$0.63	\$0.62

Conclusion

The primary limiting factor to performance and health after weaning is low appetite which predisposes piglets to enteric diseases and other disorders. This study extends previous observations that show that pigs fed benzoic acid improved growth performance and nutrient digestibility, inhibit pathogenic microorganisms, and maintain intestinal microecological balance.

Starter A supplemented with organic acid supported piglet growth performance to the same extent as the medicated starter.

If growth performance can be maximized at lower cost to the producer, then replacing antibiotics with organic acid in the starter phase can be considered a viable feeding strategy.

Reference

Benzoic acid vs. antibiotic in nursery pigs by E. Kiarie, C. Voth, D. Wey, J Zhu, P. Vingerhoeds and S. Borucki Presented in part at the 2018 ADSA-ASAS Midwest meeting in Omaha March 12-14, 2018

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