

Supplemental effects of PrimaLac on growth and carcass characteristics of finishing pigs

Principal Investigator

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Sponsor

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Objective

To determine the effects of a supplementation of PrimaLac on growth efficiency and carcass characteristics in finishing pigs

Project Description

Sixty finishing pigs (purchased from Smithfield Foods) at 85-90 kg BW were housed at the NCSU Swine Evaluation Center (Clayton, NC) and allotted to 2 dietary treatments (n=10) using sex (barrows and gilts) and body weight as blocks. This experiment was based on a randomized complete block design. Two treatments were: 1) CON (typical corn-soybean meal-DDGS diet), and 2) PL (CON + PrimaLac, 0.05%). Each treatment had 30 pigs in 10 pens (3 pigs per pen) requiring 60 pigs in total. Each treatment had 5 pens with barrows and 5 pens with gilts.

PrimaLac includes *Lactobacillus acidophilus* (2.5×10^7 cfu/gram), *Lactobacillus casei* (2.5×10^7 cfu/gram), *Bifidobacterium thermophilum* (2.5×10^7 cfu/gram), and *Enterococcus faecium* (2.5×10^7 cfu/gram). Thus all together, it provides 1×10^8 cfu/gram.

The assigned experimental diets were fed for 4 wks based on 2 phases (phase 6: 2 wk for 85 to 100 kg BW; and phase 7: 2 wk for 100 to market). Pigs had free access to diets and water during the entire period. Body weight of each pig were recorded weekly.

A week prior to market, pigs were bled to obtain plasma to measure a pro-inflammatory cytokine, TNF- α , as an indicator of systemic inflammation and urea nitrogen as an indicator of amino acid catabolism.

At the end of the feeding period (4 wks), for each treatment, a pig representing an average body weight of all pens (5 gilt pens and 5 barrow pens) were selected. Selected 20 pigs were transported to a local abattoir (Bailey, NC) to obtain dressing percentage, hot and cold carcass weight, loin eye area, loin pH, drip loss, marbling scores, and meat color score.

Data obtained from this study were evaluated for the effects of PrimaLac on growth and carcass characteristics using proc MIXED in SAS software (Cary, NC) using treatments and sex as the fixed effects and body weight blocks as a random effect.

Results

Initial body weight did not differ ($P = 0.910$) indicating that the initial allotment was conducted correctly. Average daily gain (ADG, kg/d) of pigs did not differ during week 1 but pigs with Primalac had greater ($P = 0.057$, tendency) ADG than pigs without Primalac during week 2 (Table 1). ADG of week 3 and 4 did not differ between treatments. During overall 4 wk feeding period, pigs with Primalac had greater ($P = 0.062$, tendency) ADG than pigs without Primalac.

Average daily feed intake (ADFI, kg/d) did not differ between treatments during week 1, 2, and 3. However, pigs with Primalac had greater ADFI ($P = 0.072$, tendency) than pigs without Primalac during week 4. During overall 4 wk feeding period, supplementation of Primalac increased ADFI ($P < 0.05$).

Feed efficiency expressed as gain:feed ratio did not differ between treatments during the overall 4 week feeding period.

There was no change in meat and loin characteristics except for loin pH (Table 2). Pigs with Primalac had lower ($P < 0.05$) loin pH than pigs without Primalac.

Analysis of health measures will be done shortly.

It seems that supplementation of Primalac enhanced feed intake which resulted in improved body weight gain (tendency at $P = 0.062$).

Table 1. Effect of Primalac on growth performance of pigs fed with 0.05% of Primalac supplementation.

Item	Treatment		SEM	P-value
	Control	Primalac		Trt
BW, kg				
Initial	88.5	88.5	0.618	0.910
Wk 1	93.2	93.7	0.954	0.707
Wk 2	98.3	100.6	1.038	0.153
Wk 3	103.6	105.8	1.217	0.173
Wk 4	110.7	113.4	1.147	0.119
ADG,kg/d				
Wk 1	0.671	0.753	0.103	0.580
Wk 2	0.732	0.976	0.084	0.057
Wk 3	0.748	0.742	0.064	0.936
Wk 4	1.011	1.084	0.089	0.566
Overall	0.791	0.889	0.034	0.062
ADFI, kg/d				
Wk 1	2.287	2.563	0.154	0.224
Wk 2	2.637	2.895	0.115	0.135
Wk 3	3.491	3.447	0.126	0.810
Wk 4	1.828	2.255	0.155	0.072
Overall	2.561	2.790	0.067	0.029
G:F				
Wk 1	0.282	0.284	0.035	0.981
Wk 2	0.270	0.343	0.032	0.129
Wk 3	0.214	0.215	0.018	0.930
Wk 4	0.572	0.486	0.056	0.298
Overall	0.380	0.384	0.059	0.955

Table 2. Effect of Primalac on carcass quality characteristic.

Item	Treatment		SEM	P-value
	Control	Primalac		Trt
Dry matter, %	28.4	28.0	0.5958	0.573
Fat DM basis, %	16.3	14.6	2.3192	0.610
Fat As-is, %	4.7	4.2	0.7845	0.609
Ash DM Basis, %	3.7	3.9	0.1766	0.376
Ash As-is, %	1.05	1.08	0.04	0.309
CP DM Basis, %	76.89	80.41	1.784	0.184
CP As-is, %	21.75	22.45	0.3219	0.150
Drip loss, %	18.11	17.97	0.9799	0.896
Loin color				
Frontal L*	51.76	53.11	0.9423	0.275
Frontal A*	7.03	6.52	0.5009	0.423
Frontal B*	5.08	5.20	0.3157	0.797
Medium L*	51.93	53.93	0.8051	0.054
Medium A*	5.67	5.81	0.4205	0.726
Medium B*	4.05	4.67	0.2757	0.123
Distal L*	50.46	51.92	0.8731	0.255
Distal A*	6.62	6.70	0.3153	0.862
Distal B*	4.46	4.86	0.2673	0.307
Loin marbling	2.40	2.90		0.210
Backfat thickness (1st rib), mm	27.80	29.90	1.2921	0.270
Backfat thickness (10th rib), mm	20.20	22.70	1.1778	0.156
Backfat thickness (last rib), mm	25.60	25.90	1.4894	0.889
Loin weight	6.64	7.55	0.3737	0.108
Loin pH	6.124	5.906	0.054	0.046