Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 10 *Swine Day (1968-2014)*

Article 782

1998

Effects of spray-dried egg albumin on growth performance of early-weaned pigs

M De La Llata

G S. Grinstead

J C. Woodworth

See next page for additional authors

Effects of spray-dried egg albumin on growth performance of early-weaned pigs

Authors

M De La Llata, G S. Grinstead, J C. Woodworth, Robert D. Goodband, Michael D. Tokach, Jim L. Nelssen, and Steven S. Dritz

EFFECTS OF SPRAY-DRIED EGG ALBUMIN ON GROWTH PERFORMANCE OF EARLY-WEANED PIGS

M. De La Llata, R. D. Goodband, M. D. Tokach[1], J. L. Nelssen, S. S. Dritz[2], G. S. Grinstead, and J. C. Woodworth

Summary

Seventy two early-weaned pigs (initially 12.4 lb) were used in a 14-d growth trial to evaluate a control diet (no added spray-dried egg albumin or animal plasma) or the control diet with 5% spray-dried plasma, 7% spray-dried egg albumin, or 2.5% spray-dried plasma plus 3.5% spray-dried egg albumin. Pigs fed 5% spray-dried animal plasma had greater ADG and improved F/G compared with those fed 7% spray-dried egg albumin, whereas pigs fed the control or a blend of spray-dried egg albumin plus spray-dried animal plasma had intermediate performance. These results suggest that the spray-dried egg albumin used is not an effective replacement for spray-dried animal plasma in diets for early-weaned pigs.

(Key Words: Spray-Dried Egg, Early-Weaned Pigs, Performance.)

Introduction

Swine nutritionist and producers are continually trying to reduce feed costs and improve overall profitability. One area often evaluated is the suitability of alternative protein sources to use in diets for early-weaned pigs. Currently, the protein source of choice is spray-dried animal plasma. Although this protein source is of high quality and improves growth performance of weaned pigs, it is very expensive. Therefore, finding a protein source that would offer a similar growth performance at a lower cost would greatly benefit the swine industry. Spray-dried whole egg protein has been shown to be an effective partial replacement for spray-dried animal plasma, but no information is available on the feeding value of spray-dried egg albumin. Therefore, the objective of this study was to evaluate the relative feeding values of spray-dried egg albumin and spray-dried animal plasma for early-weaned pigs.

Procedures

Seventy-two (PIC L326 × C22, initially 12.3 lb and 19 days of age) early-weaned pigs were used in this experiment. Pigs were blocked by weight to one of four dietary treatments in a randomized complete block design. There were six pigs per pen and three pens per treatment. The dietary treatments (Table 1) consisted of a control diet (no added spray-dried egg albumin or animal plasma) or the control diet with 5% spray-dried animal plasma (replacing the lysine from soybean meal), 7% spray-dried egg albumin (also replacing soybean meal), or 2.5% spray-dried plasma plus 3.5% spray-dried egg albumin. Diets were fed in a meal form for the duration of the 14 d study.

Pigs were housed at the Kansas State University Swine Teaching and Research Center. Pigs were allowed ad libitum access to food and water through a dry feeder and one nipple waterer per pen.

Pigs were weighed and feed disappearance was determined weekly for the 14 d trial to calculate ADG, ADFI, and F/G. The spray-dried egg albumin was sampled and

[1]Northeast Area Extension Office, Manhattan, KS.
[2]Food Animal Health and Management Center.

analyzed for amino acids. The amino acid profile and that of spray-dried animal plasma are provided in Table 2.

Results and Discussion

For the overall experiment (Table 3), ADG was greatest for pigs fed the 5% spray-dried animal plasma treatment and was greater (P<.05) than that of pigs fed 7% spray-dried egg albumin. Pigs fed the control and 3.5% spray-dried egg albumin plus 2.5% spray-dried animal plasma diets were intermediate. Average daily feed intake was not different (P>.05) among the dietary treatments. Feed efficiency was poorer (P<.05) for pigs fed the 7% spray-dried egg albumin diet than for pigs fed the rest of the dietary treatments. The best numerical responses for ADG, ADFI, and F/G were observed in pigs fed 5% spray-dried animal plasma.

The results from this experiment suggest that the spray-dried egg albumin used in this experiment is not suitable to replace spray-dried animal plasma in diets for weanling pigs.

Table 1. Diet Composition

	Diet			
Item	Control	5% Spray-dried animal plasma	7% Spray-dried egg albumin	3.5% Spray-dried egg albumin + 2.5% SDP
Corn	45.88	49.72	47.73	48.73
Soybean meal (46.5% CP)	31.20	22.30	22.30	22.30
Spray-dried animal plasma	–	5.00	--	2.5
Spray-dried egg albumin	--	--	7.00	3.50
Dried whey	15.00	15.00	15.00	15.00
Soy oil	3.00	3.00	3.00	3.00
Monocalcium phosphate (21% P)	1.70	1.60	1.90	1.80
Limestone	.96	1.10	.89	.97
Medication	1.00	1.00	1.00	1.0
Zinc oxide	.38	.38	.38	.38
Vitamin premix	.25	.25	.25	.25
Trace mineral premix	.15	.15	.15	.15
Salt	.25	.25	.25	.25
L-Lysine HCl	.15	.15	.15	.15
DL-Methionine	.08	.10	--	.02
Lysine, %	1.40	1.40	1.40	1.40
Ca, %	.90	.90	.90	.90
P, %	.80	.80	.80	.80

[a]Provided 50 g/ton carbodox.

Table 2. Chemical Compositions of Spray-Dried Egg Albumin and Animal Plasma[a]

Item, %	Spray-Dried Egg Albumin	Spray-Dried Animal Plasma
Protein	81.0	70.0
Arginine	4.6	5.3
Cystine	2.2	2.5
Histidine	1.9	2.8
Isoleucine	4.3	2.0
Leucine	7.0	5.6
Lysine	4.9	6.8
Methionine	2.8	0.5
Phenylalanine	5.0	4.1
Threonine	3.5	4.1
Tryptophan	1.5	1.3
Tyrosine	3.3	3.9
Valine	5.6	4.1

[a]Values expressed on an as-fed basis.

Table 3. Effects of Spray-Dried Egg Albumin on Weanling Pig Performance[a]

	Treatment				
Item	Control	5% Spray-dried animal plasma	7% Spray-dried egg albumin	3.5% Spray-dried egg albumin + 2.5% SDP	CV
Day 0 to 14					
ADG, lb	.63[bc]	.76[b]	.56[c]	.63[bc]	14.7
ADFI, lb	.85	.96	.90	.86	10.9
F/G	1.4[b]	1.26[b]	1.63[c]	1.37[b]	6.5

[a]A total of 72 weanling pigs, initially 12.4 lb. Six pigs per pen and three pens per treatment.
[b,c]Means on the same row with different superscript differ (P<.05).