BLOOD MEAL SOURCE INFLUENCES STARTER PIG PERFORMANCE[1]

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Summary

A total of 144 weanling pigs (initially 14.1 lb and 24 d of age) was used to compare three different blood meal sources in starter diets. The three sources included spray-dried porcine, spray-dried bovine, and flash-dried bovine blood meal. Each diet contained 10% dried whey and 2.5% of one of the three blood meal sources. Diets were formulated to contain 1.25% lysine and .31% methionine. Pigs receiving diets containing either source of spray-dried blood meal had improved average daily gain and feed efficiency during the first 2 weeks of the experiment and the overall trial compared to pigs receiving diets containing the flash-dried source. No differences occurred in pig performance between the two spray-dried sources. Therefore, no apparent effects were due to species differences, but the blood meal must be spray-dried in order to optimize starter pig performance.

(Key Words: Starter, Blood Meal, Performance.)

Introduction

Recent work at Kansas State University has shown spray-dried blood meal to be an effective protein source in the starter pig diet. Also, results indicate that only 2 to 3% blood meal needs to be added to the diet to optimize performance in phase II. In addition to the flash or ring-dried products that have been available for quite some time, new sources of blood meal, such as spray-dried bovine and spray-dried porcine, have been introduced recently. Therefore, the objective of this experiment was to evaluate different sources of blood meal and determine their effects on starter pig performance.

Procedures

A total of 144 weanling pigs (initially 14.1 lb and 24 d of age) was used. Pigs were allotted by weight, sex, and ancestry in a randomized complete block design to one of three dietary treatments with eight replicates of six pigs/pen. The three blood meal sources were flash-dried bovine, spray-dried porcine, and spray-dried bovine. The blood sources varied in amino acid composition, and nutritive values provided by the individual suppliers were used in diet formulation (Table 2). Calculated values for flash-dried bovine, spray-dried porcine, and spray-dried bovine were: lysine 7.25, 9.37, 11.0; methionine .80, 1.0, 1.41; isoleucine .88, .76, .92; tryptophan 1.10, 1.62, .97; and threonine 4.07, 4.27, 4.49%, respectively. All diets contained 10% dried whey and were formulated to contain 1.25% lysine, .31% methionine, .9% Ca, and .8% P. Each diet contained 2.5% of each of the various blood meal sources. Pigs were fed this diet for the 28 d trial. Pigs were housed in an environmentally controlled nursery on raised deck flooring and had ad libitum access to feed and water. Pigs and feeders were weighed weekly to determine average daily gain

[1]Appreciation is expressed to Vita Plus Corp., Madison, WI for donating the blood meal for this experiment.

(ADG), average daily feed intake (ADFI), and feed efficiency (F/G).

Results and Discussion

Amino acid analysis was conducted on each blood meal sample (Table 1) and gave lower values than those given in company literature. Pigs consuming the diets containing the spray-dried blood meal had improved ($P < .01$) ADG and F/G compared to the pigs fed the diet containing flash-dried blood meal for the first 2 weeks postweaning and the overall trial (Table 3). Average daily feed intake for the overall trial tended ($P < .09$) to be greater for pigs fed either spray-dried protein source compared to flash-dried blood meal. No significant differences occurred between the two different sources of spray-dried blood products for any of the response criteria. Results of this trial demonstrate that processing and heat treatment of the protein sources used can affect starter pig performance. Both types of blood meals are heated at high temperatures but spray-drying involves a much shorter time period for heat treatment than does the flash-dried source. This extended heating time would affect protein quality and thereby be detrimental to starter pig performance. Therefore, spray-dried source of blood meal should be used in starter pig diets in order to optimize pig performance.

Table 1. Analyzed Composition of Blood Meal Sources[a]

Item, %	Flash-dried bovine	Spray-dried bovine	Spray-dried porcine
DM	87.9	81.9	82.5
CP	89.8	88.1	89.9
Ash	1.5	5.7	5.7
Ca	.14	.04	.05
P	.11	.12	.20
Arginine	3.97	3.26	3.45
Cystine	1.12	.97	1.01
Histidine	6.00	4.68	4.91
Isoleucine	1.04	.77	.91
Lysine	8.01	7.66	7.53
Methionine	.72	1.05	.88
Phenylalanine	5.79	5.55	5.40
Threonine	3.13	3.96	3.96
Tryptophan	.75	1.61	1.67
Tyrosine	2.45	2.53	2.48
Valine	7.55	6.84	6.91
Potassium	-	.28	.60
Sodium	-	1.17	1.17
Magnesium	-	.014	.027
Sulfur	-	.68	.64
Iron	-	.19	.19

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

Table 2. Diet Composition[a]

Item, %	Blood meal source		
	Flash-dried bovine	Spray-dried bovine	Spray-dried porcine
Corn	53.86	57.07	55.68
Soybean meal (48% CP)	26.93	23.66	25.08
Dried whey, edible grade	10.00	10.00	10.00
Blood meal	2.50	2.50	2.50
Soybean oil	3.00	3.00	3.00
Monocalcium phosphate (21% P)	1.87	1.92	1.89
Limestone	.81	.82	.82
Antibiotic[b]	.50	.50	.50
Vitamin premix	.25	.25	.25
Trace mineral premix	.15	.15	.15
Copper sulfate	.075	.075	.075
Selenium premix	.05	.05	.05
Total	100.00	100.00	100.00

[a]Diets were formulated to contain 1.25% lysine, .31% methionine, .9% Ca, and .8% P.
[b]Provided 50 g/ton Carbadox.

Table 3. Growth Performance of Pigs Fed Various Blood Meal Sources[a]

Item	Blood meal source			
	Flash-dried bovine	Spray-dried bovine	Spray-dried porcine	CV
d 0 - 14				
ADG, lb[b]	.35	.46	.44	15.87
ADFI, lb	.67	.72	.70	9.54
F/G[b]	1.87	1.57	1.61	12.65
d 0 - 28				
ADG, lb[b]	.68	.79	.74	8.5
ADFI, lb[c]	1.20	1.27	1.23	5.48
F/G[b]	1.75	1.60	1.65	5.42

[a]144 weanling pigs were used (initially 14.1 lb and 24 d of age), 6 pigs/pen, 8 pens/treatment.
[b]Flash-dried vs spray-dried ($P < .01$).
[c]Flash-dried vs spray-dried ($P < .09$).