

Kansas Agricultural Experiment Station Research Reports

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

Article 886

1992

Optimum level of spray-dried blood meal in phase II diet

L J. Kats

Jim L. Nelssen

Michael D. Tokach

See next page for additional authors

Follow this and additional works at: <https://newprairiepress.org/kaesrr>



Part of the [Other Animal Sciences Commons](#)

Recommended Citation

Kats, L J.; Nelssen, Jim L.; Tokach, Michael D.; and Goodband, Robert D. (1992) "Optimum level of spray-dried blood meal in phase II diet," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 10. <https://doi.org/10.4148/2378-5977.6726>

This report is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Kansas Agricultural Experiment Station Research Reports by an authorized administrator of New Prairie Press. Copyright 1992 the Author(s). Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. K-State Research and Extension is an equal opportunity provider and employer.



Optimum level of spray-dried blood meal in phase II diet

Authors

L J. Kats, Jim L. Nelssen, Michael D. Tokach, and Robert D. Goodband

K

OPTIMUM LEVEL OF SPRAY-DRIED BLOOD MEAL IN PHASE II DIET¹

S

*L. J. Kats, J. L. Nelssen, M. D. Tokach,
and R. D. Goodband*

U

Summary

A total of 744 pigs (initially 12.8 lb and 22 d of age) was used in a 28 d trial to determine the effects of increasing levels of blood meal in the phase II (d 7 to 28) diet. Pigs were allotted by sex and weight and placed in pens containing 13 to 14 pigs each. A common phase I diet was fed for the first 7 days postweaning. The phase I diet contained 37.5% dried whey and 7.5% porcine plasma and was formulated to contain 1.5% lysine. After the phase I period, pigs were assigned to one of six dietary treatments that contained 10% dried whey and either 0, 1, 2, 3, 4, or 5% spray-dried blood meal. These diets were fed for the entire phase II period (d 7 to 28 postweaning). Phase II diets were formulated to contain 1.25% lysine and a minimum of .68% isoleucine and .30% methionine. During phase I (d 0 to 7), average daily gain, average daily feed intake, and feed efficiency (F/G) were .34 lb, .38 lb, and 1.28, respectively. During phase II (d 7 to 28), quadratic improvements occurred in average daily gain, average daily feed intake, and feed efficiency, with optimum performance achieved at approximately the 2% inclusion rate of spray-dried blood meal. Therefore, the results of this trial indicate that the optimal level of spray-dried blood meal in the phase II diet is approximately 2%.

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

Introduction

The advent of spray-drying various by-products has produced many effective feed ingredients that are available for use in swine diets. Previous research conducted at Kansas State University has shown that spray-dried porcine plasma is an effective ingredient to improve starter pig performance. However, spray-dried porcine plasma is not cost effective in diets other than the high nutrient density diet (phase I). Therefore, alternative products need to be evaluated for use in diets for the later stages of the nursery phase. One such ingredient has been spray-dried blood meal, which is a by-product of the meat processing industry. This particular feedstuff has been shown to be quite effective when used in the phase II diet for nursery pigs. In previous trials, 2.5% spray-dried blood meal was a superior protein source in the phase II diet compared to soy protein concentrate, extruded soy protein concentrate, and fish meal. However, in past trials, blood meal replaced 5% select menhaden fish meal on an equal lysine basis, so the ideal inclusion rate in the diet was not known. This trial was conducted to evaluate various levels of spray-dried blood meal in the phase II diet and to determine where pig performance was maximized.

Procedures

A total of 744 pigs (initially 12.8 lb and 22 d of age) was used in a 28 d trial. Pigs

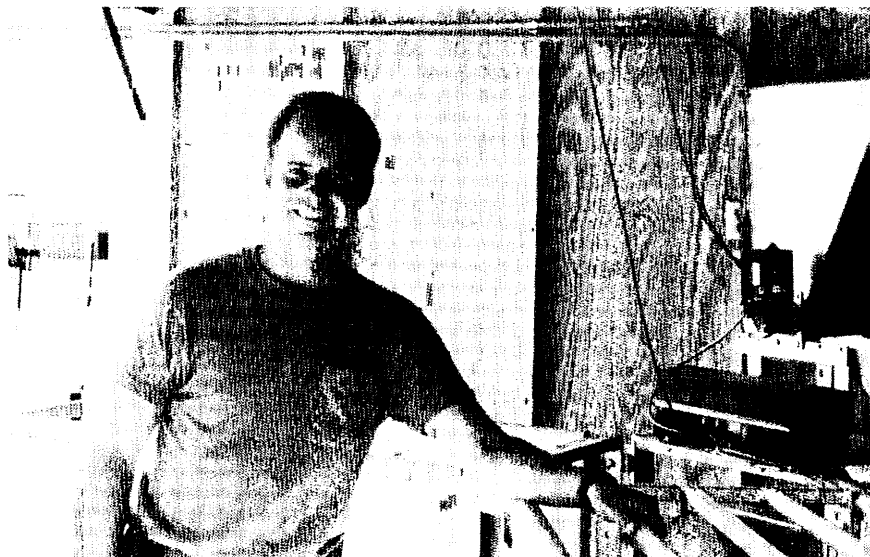
¹Appreciation is expressed to California Spray Dry, Inc. Modesto, CA for donating the blood meal and Feed Specialties, Des Moines, IA for partial financial support. The authors wish to thank Dale Keesecker and Keesecker Agribusiness, Washington, KS for use of facilities and animals.

were allotted by sex and weight and placed in pens containing 13 to 14 pigs each. A common phase I diet was fed for the first 7 days postweaning. The phase I diet contained 37.5% dried whey and 7.5% porcine plasma and was formulated to 1.5% lysine. After the phase I period, pigs were assigned to one of six dietary treatments that contained 10% dried whey and either 0, 1, 2, 3, 4, or 5% spray-dried blood meal. These diets were fed for the entire phase II period (d 7 to 28 postweaning). Phase II diets (Table 1) were formulated to contain 1.25% lysine, .68% isoleucine, and .30% methionine. Pigs and feeders were weighed on d 7, 14, and 28 postweaning to evaluate average daily gain (ADG), average daily feed intake (ADFI), and feed efficiency (F/G).

Results and Discussion

During phase I (d 0 to 7), ADG, ADFI, and F/G were .34 lb, .38 lb, and 1.28,

respectively. During the first week of phase II (d 7 to 14), a linear and quadratic response ($P < .01$) in ADG occurred with the addition of blood meal to the diet (Table 2). Average daily feed intake followed a similar trend, with pigs receiving at least 2% blood meal consuming approximately .10 lb/d more than those pigs receiving no blood meal. A significant ($P < .01$) improvement in feed efficiency also occurred with the addition of blood meal during the first week of phase II. During phase II (d 7 to 28) and the overall trial, quadratic improvements ($P < .01$) occurred in ADG, ADFI, and F/G with the addition of blood meal. The optimum level of performance was achieved at the 2% blood meal level, with ADG, ADFI, and F/G being .68 lb, 1.05 lb, and 1.56, respectively, in the phase II period. The results of this trial indicate that an inclusion level of approximately 2% spray-dried blood meal in the phase II diet will optimize pig performance and cost effectiveness.



Joe Carpenter, swine herdsman, inspects the new computerized sow feeder.

Table 1. Phase II Diet Composition^a

Item, %	Spray-dried blood meal, %					
	0	1	2	3	4	5
Corn	49.62	51.74	53.85	55.97	58.08	60.20
Soybean meal (48% CP)	33.07	29.90	26.73	23.55	20.38	17.21
Dried whey, edible grade	10.00	10.00	10.00	10.00	10.00	10.00
Blood meal	-	1.00	2.00	3.00	4.00	5.00
Soybean oil	3.00	3.00	3.00	3.00	3.00	3.00
Monocalcium phosphate (21% P)	1.76	1.81	1.87	1.93	1.98	2.04
Limestone	.81	.81	.81	.81	.81	.82
Antibiotic ^b	1.00	1.00	1.00	1.00	1.00	1.00
Vitamin premix	.25	.25	.25	.25	.25	.25
Trace mineral premix	.15	.15	.15	.15	.15	.15
Salt	.15	.15	.15	.15	.15	.15
Copper sulfate	.075	.075	.075	.075	.075	.075
Selenium premix	.05	.05	.05	.05	.05	.05
Vitamin E	.05	.05	.05	.05	.05	.05
Total	100.00	100.00	100.00	100.00	100.00	100.00

^aDiets were formulated to contain 1.25% lysine, .9% Ca, .8% P, and at least .68% isoleucine and .30% methionine.

^bProvided 50 g/ton Carbadox.

Table 2. Influence of Various Levels of Blood Meal in the Phase II Diet^a

Item	Spray-dried blood meal, %						CV
	0	1	2	3	4	5	
<u>d 7 to 14</u>							
ADG, lb ^{bcd}	.26	.34	.43	.40	.42	.40	22.9
ADFI, lb ^{ef}	.55	.59	.64	.61	.64	.63	11.8
F/G ^{bcd}	2.49	1.82	1.56	1.62	1.59	1.54	22.4
<u>d 7 to 28</u>							
ADG, lb ^{cd}	.60	.66	.68	.67	.66	.66	8.6
ADFI, lb ^f	.979	1.02	1.05	1.01	1.04	1.03	7.2
F/G ^{bcd}	1.66	1.54	1.55	1.51	1.60	1.57	3.8

^aSeven hundred and forty four weanling pigs were used (initially 12.8 lb and 22 d of age), 13-14 pigs/pen, 12 pens/treatment.

^bLinear effect of blood meal ($P < .01$, .05, respectively).

^cQuadratic effect of blood meal ($P < .01$).

^dControl vs blood meal ($P < .01$, .05, respectively).