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Effects of various fat sources on growth performance of finishing pigs

Abstract

One hundred and twenty-eight finishing pigs averaging 124 lb were utilized to evaluate the effects of different fat sources on growth performance. Pigs were fed one of four diets containing either no added fat (control) or 4% added fat from soybean oil, coconut oil, or choice white grease. The control diet was formulated to contain 14.5 % crude protein and .66 % lysine. All fat-added diets were formulated with the same calorie:lysine ratio as the control diet. There were no differences in average daily gain between pigs fed either the control diet or diets containing added fat. Daily feed intake was reduced for pigs fed added fat from 4 to 7% compared to pigs fed no added fat, with pigs fed choice white grease having the lowest feed intake. This resulted in pigs fed choice white grease having 11% better feed efficiency compared to pigs fed no added fat. Pigs fed soybean oil exhibited a 4% improvement in feed efficiency, and those fed coconut oil were intermediate, with an 8% improvement in feed efficiency. These results indicate that 4% added fat reduces feed intake and improves feed efficiency of finishing pigs. In addition, it appears that choice white grease may be a superior fat source in finishing pig diets.; Swine Day, Manhattan, KS, November 16, 1989

Keywords

Swine day, 1989; Kansas Agricultural Experiment Station contribution; no. 90-163-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 581; Swine; Finishing pigs; Soybean oil; Coconut oil; Choice white grease; Performance

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EFFECTS OF VARIOUS FAT SOURCES ON GROWTH PERFORMANCE OF FINISHING PIGS

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Summary

One hundred and twenty-eight finishing pigs averaging 124 lb were utilized to evaluate the effects of different fat sources on growth performance. Pigs were fed one of four diets containing either no added fat (control) or 4% added fat from soybean oil, coconut oil, or choice white grease. The control diet was formulated to contain 14.5 % crude protein and .66 % lysine. All fat-added diets were formulated with the same calorie:lysine ratio as the control diet. There were no differences in average daily gain between pigs fed either the control diet or diets containing added fat. Daily feed intake was reduced for pigs fed added fat from 4 to 7% compared to pigs fed no added fat, with pigs fed choice white grease having the lowest feed intake. This resulted in pigs fed choice white grease having 11% better feed efficiency compared to pigs fed no added fat. Pigs fed soybean oil exhibited a 4% improvement in feed efficiency, and those fed coconut oil were intermediate, with an 8% improvement in feed efficiency. These results indicate that 4% added fat reduces feed intake and improves feed efficiency of finishing pigs. In addition, it appears that choice white grease may be a superior fat source in finishing pig diets.

(Key Words: Finishing Pigs, Soybean Oil, Coconut Oil, Choice White Grease, Performance.)

Introduction

Recent research conducted at Kansas State University has demonstrated differences in starter pig performance with various fat sources. These studies indicate that quality of added fat is an important variable in improving starter-pig performance. Furthermore, factors such as chain length and degree of saturation may affect digestibility, absorption, and utilization of the added fat. In starter pigs, it appears that a combination of long chain, unsaturated fatty acids (soybean oil) and short chain fatty acids (coconut oil) results in improved pig performance. However, little information is available on the effects of different fat sources on finishing pig performance. Therefore, this study was conducted to determine the effects of 4% additions of soybean oil, coconut oil, or choice white grease on pig performance.

Experimental Procedures

One hundred twenty-eight finishing pigs (initial wt 124 lb) were allotted on the basis of weight, sex, and ancestry to one of four dietary treatments. There were eight pigs per pen and four pens per treatment. The control diet (no added fat) contained milo and soybean meal and was formulated to contain 14.5% crude protein and .66% lysine (Table 1). Fat sources used in this study were soybean oil, coconut oil, and choice white grease. The fat sources were

Table 1. Diet Composition

Ingredient	No added fat	Added fat
Milo	80.19	74.68
Soybean meal (44% CP)	17.00	18.35
Fat ^a	--	4.00
Monocalcium phosphate	1.00	1.20
Limestone	.96	.92
Salt	.50	.50
Vitamin premix ^b	.25	.25
Trace mineral premix ^c	.10	.10
<u>Calculated analysis</u>		
Crude protein, %	14.70	14.80
Lysine, %	.66	.69
Ca, %	.65	.68
P, %	.55	.58
ME, Kcal/lb	1441	1512
g lysine/Kcal, ME	2.08	2.08

^aFat sources included soybean oil, coconut oil, and choice white grease.

^bEach lb of vitamin premix contains: vitamin A, 1,000,000 IU; vitamin D₃, 100,000 IU; vitamin E, 4,000 IU; menadione, 400 mg; riboflavin, 1,000 mg; pantothenic acid, 2,500 mg; niacin, 5,500 mg; choline, 100,000 mg; and vitamin B₁₂, 5 mg.

^cContains 10% Mn, 10% Fe, 10% Zn, 4% Ca, 1% Cu, .4% K, .3% I, .2% Na, and .1% Co.

added to the diet at a level of 4%. The level of soybean meal was increased to maintain the same calorie:lysine ratio as in the control diet. Feed and water were provided ad libitum. Pigs were housed in a modified, open-front building with half solid and half slotted flooring. Each pen (6 ft × 10 ft) contained one, two-hole self-feeder and a nipple waterer. The trial lasted 63 d.

Results and Discussion

The addition of 4% fat to the diets, regardless of source, resulted in no differences in average daily gain (ADG) compared to pigs fed no added fat (Table 2). However, pigs fed the diet containing choice white grease had numerically the highest ADG, approximately 5% greater than pigs fed either soybean oil or no added fat. Average daily feed intake (ADFI) was lower for pigs fed added fat, again with the largest reduction for those pigs fed choice white grease (7% less than pigs fed no added fat; $P < .10$). Feed efficiency (F/G) was improved for pigs fed diets containing added fat compared to those fed no added fat. However, the degree of improvement in F/G was affected by the different fat sources. Pigs fed soy oil had a slight numerical improvement in F/G compared to pigs fed no added fat (4%), whereas pigs fed

Table 2. Effect of Fat Source on Finishing Pig Performance^a

Item	No added fat	Soy oil	Coconut oil	Choice white grease
ADG, lb	1.86	1.86	1.91	1.95
ADFI, lb	7.09 ^b	6.81 ^{bc}	6.69 ^c	6.63 ^c
F/G	3.82 ^d	3.67 ^{de}	3.51 ^{ef}	3.40 ^f

^aA total of 128 finishing pigs, avg initial wt 124 lb, avg final wt 230 lb. There were eight pigs per pen and four pens per treatment. The trial lasted 63 d.

^{bc}Means for the same criterion with different superscripts differ ($P < .10$).

^{def}Means for the same criterion with different superscripts differ ($P < .05$).

coconut oil and choice white grease were 8 and 11% more efficient, respectively ($P < .05$). From data collected previously on the effects of these fat sources on starter-pig performance, the differences observed in F/G are unexpected, since all three fat sources used are typically high in quality.

These data indicate that the addition of 4% fat to finishing diets improves F/G between 4 to 11%. In addition, choice white grease seems to be a better fat source than soybean oil in finishing pig diets.



Chin Li prepares samples for analysis.