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Processed Whole Soybeans in Growing-Finishing Rations

B. A. Koch, R. H. Hines, and D. T. Lafferty

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Summary

This progress report covers only growth rate and feed efficiency of pigs the first 73 days of one feeding trial. Replacing soybean meal with either dry-roasted whole soybeans or pressure-extruded, whole soybeans did not significantly affect rate of growth or feed efficiency. Results were similar when the replacement was on a pound-for-pound basis or a protein-unit basis. Also, results were similar with rations in pellet or meal form. Pelleted rations were 2 to 14% more efficient than meal rations. Barrows gained 8% faster than gilts.

Procedure

Seventy crossbred feeder pigs (42 barrows and 28 gilts) averaging approximately 80 lbs. were assigned to pens of 10 each (6 barrows and 4 gilts) and fed the rations listed below. Breed, sex, age, and weight were fed (self-feeders) to an average weight of approximately 220 lbs. in the K.S.U. finishing barn. Each pen was 6 ft. wide and 16 ft. long. The floor was totally slotted (concrete).

Table 4. Basal Soybean Ration^{4,5}

<u>Ingredient</u>	<u>Pounds per ton of ration</u>
Gr. sorghum grain	1520
Soybean meal (44%)	375
Base mix A ¹	75
Base mix B ²	25
ASP-250 ³	5

¹ Each pound of Premix A contains: 99,000 U.S.P. units of vitamin A; 49,500 U.S.P. units of vitamin D; 50 mg. of riboflavin; 300 mg. of niacin; 300 mg. of Ca. pantothenate; 1,000 mg. of choline; 0.2 mcg. of vitamin B₁₂; 99 I.U. of vitamin E; 10 mg. of thiamine; 17 mg. of pyridoxine; 8 mg. of folicin; and 1.5 mg. of biotin.

- ² Each pound of Premix B contains: 10.5% phosphorous, 15.5% calcium, 2.25% potassium, 3.5% magnesium plus trace minerals.
- ³ Each pound of ASP-250 contains: 20 gms. of aureomycin, 20 gms. of sulfamethazine, and 10 gms. of penicilin.
- ⁴ Whole cooked soybeans (Roast-A-Tron process) or whole extruded soybeans were used to replace soybean meal on a pound-for-pound basis. The protein-equivalent ration contained 350 lbs. instead of 400 lbs. of soybean oil meal.
- ⁵ One ton of the basal ration was fed to each pen of pigs. Then 25 lbs. of soybean preparation in each formula was replaced with sorghum grain. ASP-250 was removed from the ration. Premix A was reduced to 60 lbs. and premix B increased to 40 lbs.

Table 5. Chemical Analyses of Soybean Rations¹

	Soybean meal	Supplemental Protein		Extruded beans
		SBOM prot-equiv. ³	Cooked beans ²	
	%	%	%	%
Crude protein	16.3	14.5	14.7	14.9
Ether extract	2.45	2.00	4.46	4.86
Crude fiber	3.16	2.73	2.55	2.47
Total ash	6.25	6.69	5.79	5.91
Calcium	.88	1.00	.80	.80
Phosphorous	.75	.85	.80	.75
Calories/gm	3853	3670	3927	3976

¹ Analyses in Department of Animal Science Laboratory.

² Roast-A-Tron process.

³ Ration formulated with equivalent crude protein to equal the processed bean rations.

Results and Discussion

Analytical results are shown in table 5; performance data, in table 6. All pigs went on feed without problems and all but one (broken leg) continued to do well throughout the feeding period. Feed wasted was minimal in all lots. Feed samples were collected from the self-feeders for analyses. Replacing soybean meal with whole processed soybeans on a pound-for-pound basis reduced crude protein approximately 1%, but increased fat content approximately 2%. Pelleted rations supported more efficient gains than meal rations.

Table 6. Performance Data for Finishing Swine Using Whole Soybeans as a Protein Source

<u>Item</u>	<u>SBOM prot-equiv.</u>	<u>Pelleted rations</u>		
		<u>Soybean meal</u>	<u>Cooked soybeans</u>	<u>Extruded soybeans</u>
No. pigs	10	10	10	10
Avg. int. wt., lbs.	78	78	81	85
Avg. final wt., lbs.	208	212	201	217
Avg. daily gain, lbs.*	1.77	1.81	1.63	1.81
Avg. daily feed int., lbs.	5.41	5.45	4.98	5.55
Feed/gain, lbs.	3.02	2.98	3.03	3.07
		<u>Meal rations</u>		
No. pigs		10	10	10
Avg. int. wt., lbs.		80	76	77
Avg. final wt., lbs.		209	203	200
Avg. daily gain, lbs.*		1.76	1.71	1.65
Avg. daily feed, lbs.		6.05	5.61	5.28
Feed/gain, lbs.		3.40	3.22	3.14

* Standard error of mean = .06 lbs.