

Inclusion of Pea Chips in Diets Fed to Swine

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Recently, interest in research on the use of alternative feed sources, such as field peas, in swine diets has been increasing.

Pea “chips” are a byproduct of the pea-processing industry that have been utilized in livestock rations. When peas are processed for production of split peas, a certain portion are crushed, which results in pea chips.

Pea chips are a good alternative feed source due to their considerable amount of crude protein. That makes them a good replacement for soybean meal, which is the highest-priced ingredient in swine rations.

Several experiments investigating the effects of the inclusion of pea chips in diets fed to swine have been conducted. The results of the various experiments indicate that pigs tolerate pea chips and the inclusion of pea chips in a diet has minimal negative effect on performance, carcass quality and the palatability of pork.

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Pea Chips Fed to Grow/Finish Pigs

In an experiment conducted at North Dakota State University, pea chips were included in early and late corn-soybean meal-based finisher diets to evaluate pea chip effects on performance, carcass quality and composition, and palatability. Twenty-four finishing barrows were obtained from the NDSU Swine Research Unit, housed individually and fed experimental diets. In both phases, the experimental diets consisted of replacing soybean meal with pea chips at 0, 33.3, 66.6 or 100 percent of the soybean meal.

Table 1. Effects of replacing soybean meal with pea chips on carcass composition and quality.¹

Item	Soybean meal replacement, %			
	0	33.30	66.6	100
Live weight, lb.	280.00	291.30	285.80	297.30
Hot carcass weight, lb.	214.70	221.80	213.80	211.20
Dressing, %	76.80	76.11	74.80	75.61
Loin muscle area, in. ²	8.34	7.73	7.97	8.17
10th rib back fat, in.	0.98	1.22	0.94	0.98
Lean meat, %	53.58	50.28	53.17	53.52

¹ Data are means of six observations per treatment.

Table 2. Effects of replacing soybean meal with pea chips on growth performance of growing-finishing pigs fed experimental diets.¹

Item	Soybean meal replacement, %			
	0	33.30	66.6	100
Entire period				
Initial weight, lb.	127.10	125.10	124.40	124.80
Average daily feed intake, lb.	6.80	6.90	7.00	6.90
Average daily gain, lb.	2.20	2.40	2.30	2.20
Average gain:feed, lb./lb.	0.323	0.347	0.328	0.318
Final weight, lb.	279.50	290.80	285.30	278.80

¹ Data are means of six observations per treatment.

Results show that including pea chips in the diets does not influence growth performance. During the early finishing phase of the experiment, pea chips had no negative effects on final weight and feed intake, and they had a positive effect on daily gain and feed efficiency. During the late finishing phase, pea chips had no negative effects on final weight, daily gain, feed intake and feed efficiency.

The entire experimental period revealed no negative effects of pea chips on final weight, feed intake and feed efficiency. These data concur with research conducted at South Dakota State University (Stein et al. 2006).

Likewise, no negative effects of pea chips were observed on carcass composition because no differences were found in hot carcass weight, loin muscle area, 10th rib back fat, lean meat percentage, marbling, drip loss and purge loss among treatments. Moreover, cook loss percentage, shear force, juiciness and pork flavor scores were not different among treatments.

However, the inclusion of pea chips in the diet resulted in reduced color scores. Results from the taste panel indicate that pork chops become slightly tougher as pea chips are included in the diets, although this observation was not supported by differences in shear force values.

These results indicate that pea chips may be included in corn-soybean-based diets fed to finishing pigs without negatively influencing growth performance or carcass composition.

Pea Chips and Distillers Dried Grains With Solubles Fed to Growing/Finishing Pigs

In a different experiment conducted at NDSU, 24 individually housed growing pigs (12 barrows and 12 gilts) were used to evaluate the effects of replacing soybean meal with a combination of distillers dried grains with solubles (DDGS) and pea chips in diets fed to growing-finishing pigs. The effects were compared on growth performance, carcass quality and the palatability of pork chops.

The experiment was divided into three phases: grower, early finisher and late finisher. During all three phases, a combination of DDGS and pea chips at a ratio of 3-to-4 replaced 0, 50 or 100 percent of the soybean meal in the diet.

Pig performance results varied among phases of the experiment; however, overall feed intake was reduced as soybean meal was replaced with DDGS and pea chips. As well, final weight and hot carcass weight were reduced as soybean meal was replaced by DDGS and pea chips.

In terms of palatability, tenderness and juiciness showed no differences among treatments; however, pork flavor decreased as pea chips and DDGS replaced soybean meal in the diets. Moreover, the inclusion of DDGS and pea chips in the diet tended to reduce carcass pH levels and belly firmness.

Based on these results, pea chips/DDGS should be utilized in growing-finishing diets only if the pea chips/DDGS cost less than the traditional corn-soybean meal-based diets.

Conclusions

Although more trials utilizing large-group research are needed, based on the results of the NDSU studies, pea chips may be included in the diets of finishing pigs if the pea chips are competitively priced. Even though results show negative performance and carcass results when DDGS and pea chips were used, replacing soybean meal with pea chips alone revealed minimal negative effects.

For more information on this and other topics, see: www.ag.ndsu.edu

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