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Abstract

One hundred twenty-six weaned, crossbred pigs averaging 14 kg (31 lbs.) initially were used to evaluate the effects of various methods of processing sorghum grain. Processing methods evaluated were: pelleting, extruding, micronizing, high-moisture grain stored in an oxygen limiting structure, and high-moisture grain treated with propionic acid. Except for pelleting, only the grain (sorghum) was exposed to the various processing methods. After being processed, the sorghum was ground and incorporated into a 18% sorghum-soybean meal diet. None of the processing methods increased weight gain of weaned pigs over that by pigs fed the control diet (ground sorghum fed as a meal). Extruding reduced weight gain. Pelleting was the only processing method that improved feed efficiency.; Swine Day, Manhattan, KS, November 11, 1976

Keywords

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Effects of Processing Methods on the Nutritional Value of Sorghum for Weaned Pigs

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Summary

One hundred twenty-six weaned, crossbred pigs averaging 14 kg (31 lbs.) initially were used to evaluate the effects of various methods of processing sorghum grain. Processing methods evaluated were: pelleting, extruding, micronizing, high-moisture grain stored in an oxygen limiting structure, and high-moisture grain treated with propionic acid. Except for pelleting, only the grain (sorghum) was exposed to the various processing methods. After being processed, the sorghum was ground and incorporated into a 18% sorghum-soybean meal diet. None of the processing methods increased weight gain of weaned pigs over that by pigs fed the control diet (ground sorghum fed as a meal). Extruding reduced weight gain. Pelleting was the only processing method that improved feed efficiency.

Introduction

Sorghum is the primary energy source of swine rations in parts of the Midwest and Southwest. In ruminants, the availability of starch in sorghum can be improved by processing. Limited information is available on the effects of some of the newer methods of processing on the feeding value of sorghum in swine rations. Processing methods we evaluated included pelleting, extruding, micronizing, high-moisture stored in oxygen-limiting structure, and high-moisture treated with propionic acid.

Procedures

One hundred twenty-six crossbred pigs averaging 14 kg (31 lbs.) initially were randomly assigned to 18 pens representing three replications of the six dietary treatments. The treatments used were:

1) Ground (fed in meal form)
2) Pelleted (entire ration fed as 3/16 inch pellets)
3) Sorghum extruded, then ground
4) Sorghum micronized, then ground
5) Sorghum containing 27% moisture removed from oxygen-limiting structure, treated with 0.4% propionic acid, and ground
6) Sorghum containing 24% moisture treated with 1.2% propionic acid, then ground.

The control (ground) diet contained 68.8% sorghum, 26.7% soybean meal (44% protein), 2.0% dicalcium phosphate, 1.0% limestone, 0.5% salt, and 1.0% of a vitamin, trace-mineral, antibiotic premix. All rations provided an equivalent amount of dry matter from sorghum. The growth trial lasted 44 days.

Results and Discussion

Effects of the various methods of grain processing on the performance of weaned pigs are shown in table 23. None of the processing methods studied improved daily gain of pigs over that by pigs fed the control diet (ground sorghum fed as a meal). Pigs fed the extruded sorghum gained significantly slower (P<.05) than pigs fed the ground sorghum. Pelleting significantly (P<.05) improved feed efficiency over that of pigs fed the ground sorghum diet.

These results suggest that micronization, high-moisture acid-treated, or high-moisture stored in oxygen-limiting structure, has no beneficial effects on the feeding value of sorghum for growing pigs.

Table 23. Effect of grain processing methods on performance of weaned pigs.[a]

Processing methods	Ground	Pelleted	Extruded	Micronized	High-moisture oxygen-limiting	High-moisture propionic acid
No. of pigs /treatment	21	21	21	21	21	21
Daily gain, lb.	1.25[b]	1.21[b]	1.09[c]	1.24[b]	1.31[b]	1.28[b]
Daily feed intake, lb.	2.42	2.17	2.32	2.28	2.43	2.41
Feed/gain	1.94[c]	1.79[d]	2.13[b]	1.84[c,d]	1.86[c,d]	1.88[c,d]

[a] All feed data expressed on a dry matter basis.
[b,c,d] Means with different superscripts differ significantly (P<.05).