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High-moisture sorghum for growing-finishing swine

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Abstract

Eighty-seven crossbred pigs (averaging 95 pounds initially) were used to compare the value of sorghum grain harvested with high-moisture and stored in an oxygen-limiting structure with that harvested with high-moisture and treated with propionic acid (1.2%), and stored in a metal bin, or field dried. Average daily gain, average daily feed intake, and feed/gain ratios in a growth trial and protein and energy digestibilities in a digestion trial, showed that high-moisture sorghum grain and field-dried sorghum have equal feeding values when compared on a dry-matter basis.; Swine Day, Manhattan, KS, November 11, 1976

Keywords

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High-moisture Sorghum for Growing-finishing Swine

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Summary

Eighty-seven crossbred pigs (averaging 95 pounds initially) were used to compare the value of sorghum grain harvested with high-moisture and stored in an oxygen-limiting structure with that harvested with high-moisture and treated with propionic acid (1.2%), and stored in a metal bin, or field dried.

Average daily gain, average daily feed intake, and feed/gain ratios in a growth trial and protein and energy digestibilities in a digestion trial, showed that high-moisture sorghum grain and field-dried sorghum have equal feeding values when compared on a dry-matter basis.

Introduction

On a dry-matter basis, high-moisture corn has approximately the same feeding value as field-dried corn for swine. The high-moisture grain can be stored in the absence of oxygen to decrease aerobic microbial activity or it can be treated with organic acid to decrease microbial activity and then be stored exposed to air. We compared the feeding value of high-moisture sorghum grain handled those two ways for growing-finishing swine.

Procedure

General. The high-moisture acid-treated (HM-PA) sorghum grain contained 23% moisture; the high-moisture grain stored in an oxygen-limiting structure (HM-O_2L),contained 27%; and the field dried grain, 13%. The field dried grain was ground and incorporated into a 16% protein diet, which was 78.97% sorghum grain, 17.85% soybean meal (44%), 0.76% dicalcium phosphate, 0.92% limestone, 0.5% salt, and 1.0% vitamin, trace mineral, antibiotic premix. The high-moisture grain diets were ground and formulated on an equal dry-matter basis with the dry grain. Propionic acid (0.4%) was added to the HM-O_2L grain before mixing to prevent spoilage in the feeders.

Feeding Trial. Eighty-one crossbred pigs averaging 95 pounds initially were fed 3 pigs/pen (27/treatment). Each pen (4' x 16') had a solid concrete floor and contained a one-hole self-feeder and an automatic waterer. The trial lasted 66 days.

Digestion Trial. A replicated, 3 x 3 Latin square digestion trial was conducted with two groups of three littermate barrows averaging 140 pounds initially. They were housed individually in metal metabolism crates allowing for separate collection of urine and feces. Daily feed intake was constant and fed in two equal portions. Water was supplied at each feeding. A five-day, pre-test preceded each five-day collection period. Feed and feces were analyzed for protein and energy.

Results and Discussion

Results of the feeding trial are presented in table 21. Pigs fed the high-moisture grain diets, either treated with propionic acid or stored in an oxygen-limiting structure performed as well as those fed the field-dried sorghum grain (comparisons on an equal dry-matter basis). There was no significant difference among treatments in average daily gain, average daily feed intake or feed/gain ratios.

In the digestion trial, all three treatments resulted in equal protein and energy digestibilities (table 22).

From these two trials, we concluded that high-moisture sorghum grain has approximately the same feeding value as field-dried sorghum grain compared on an equal dry-matter basis.

Table 21. Performance of finishing pigs.[a]

Treatment	Daily gain, kg(lb.)	Feed/ gain	Daily intake, kg(lb.)
Dry	0.88(1.94)	2.79	3.18(6.99)
HM-PA	0.86(1.89)	2.70	3.14(6.91)
HM-O_2L	0.89(1.96)	2.81	3.16(6.95)

[a]Each value is the mean of 27 pigs with an initial weight of 43.35 kg (95 pounds).

Table 22. Protein and energy digestiblity.[a]

Treatment	Protein	Energy
Dry	79.75±2.36	84.64±2.19
HM-PA	82.20±2.32	86.02±1.54
HM-O_2L	82.95±2.47	84.51±1.33

[a]Each value is the mean±standard deviation of 6 observations.