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Nutritional value of pearl millet for swine

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Summary

A growth trial and a digestion trial were conducted using 44 crossbred pigs (initial average weight 40 pounds) to determine the nutritional value of pearl millet as a feedstuff for swine. The millet used contained 11.98% protein (N x 6.25) and 0.40% lysine on a dry matter basis. In the growth trial, replacing 50 or 100% of the corn with millet had no significant effect on feed intake, daily gain, or feed/gain. Results of the digestion trial suggest that the digestibility of protein and energy in millet is similar to that of corn.

Introduction

Although widely grown in other parts of the world, pearl millet is a relatively new crop in this country. It is higher in protein and contains more lysine than milo or corn. This study evaluated its nutritional value as a swine feed.

Procedures

Thirty-two crossbred pigs averaging 40 pounds initially were assigned, based on sex and initial weight, to eight pens. Each pen was randomly assigned to one of four dietary treatments.

- 1) Corn-soybean meal (control)
- 2) Millet replacing 50% of the corn
- 3) Millet replacing 100% of the corn
- 4) Millet-soybean meal (protein content equal that of control)

Compositions of the experimental diets are shown in table 14. All diets were fed in pellet form. The trial lasted 28 days.

Table 14. Percentage composition of diets

Ingredient	Diets			
	A	B	C	D
Corn	75.0	37.5		
Millet		37.5	75.0	78.0
Soybean meal (44%)	20.9	20.9	20.9	17.9
Dicalcium phosphate	1.8			
Limestone	0.8			
Salt	0.5	Same as Diet A		
Vitamin, trace-mineral and antibiotic premix	1.0			
	100.0	100.0	100.0	100.0

Table 15. Protein and amino acid contents of millet¹

Protein	11.89
Lysine	0.40
Histidine	0.44
Arginine	0.53
Threonine	0.48
Valine	0.68
Isoleucine	0.46
Leucine	1.15
Tyrosine	0.37
Phenylalanine	0.52

¹Expressed in percentage on a dry matter basis.

Results and Discussion

Performances of growing pigs fed diets containing various percentages of millet are shown in table 16. Replacing 50 or 100% of the corn with millet in a 16% protein corn-soybean meal diet had no significant effect on daily gain, feed intake, or feed efficiency. Similarly, performance of pigs fed millet and soybean meal (equal in protein content to control diet) did not differ significantly from that of pigs fed the control diet.

Apparent digestibility of protein and energy in the millet diets are shown in table 17. There were no significant differences among diets in the apparent digestibility of energy and protein.

Results of the growth trial and digestion trial suggest that millet is similar to corn in feed value for growing pigs. When the millet was ground and fed as a pellet its acceptability by pigs was not a problem. Our results indicate that millet could be substituted on a protein basis (replacing corn and part of the soybean meal) without having a detrimental effect on the performance of growing pigs. The millet we used contained 0.40% lysine, more than corn or milo contains. Until we know more about variation in protein and lysine contents of millet, substituting millet for other cereal grains in swine diets should be made on a pound-for-pound basis. However, if millets consistently contain more lysine than corn or milo, savings in soybean meal supplement seem possible.

Table 16. Performance of growing pigs fed diets with indicated percentages of millet^{a,b}

Diet	Daily gain lb.	Feed/gain	Feed intake, lb.
Corn-SBM (Control)	1.52	2.03	3.08
Millet (50% replacement)	1.61	2.00	3.21
Millet (100% replacement)	1.56	2.05	3.19
Millet (equal protein to control)	1.45	2.12	3.08

^aTwo replication of four pigs each.

^bNo significant differences between treatments.

Table 17. Apparent digestibility of energy and protein¹ in millet compared with those of corn

Diet	Apparent Digestibility, %	
	Energy	Protein
Corn-SBM (control)	85.05	80.09
Millet (50% replacement)	84.37	80.19
Millet (100% replacement)	84.53	81.26
Millet (equal protein to control)	83.65	80.18

¹Each value is the mean of 6 observations. No significant differences among treatments.