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Toxicity Study Using Pine Sawdust as a Roughage Replacement
in Gestating Beef Heifer Rations¹

A. L. Slyter and L. D. Kamstra

Introduction

Sawdust, one of many cellulose-containing waste materials, presents a pollution problem in disposal. High insolubility and lignification prevent rapid decomposition by natural processes. Lignin encrusting of the cellulose fibers inhibits digestion by ruminants. Other components may be toxic to the rumen microorganisms, the animal itself, inhibit conception or be detrimental to the fetus of an animal during gestation. Ingestion of pine needles has been associated with embryonic abortion during periods of heavy snow cover.

The purpose of this was to determine what difficulties might be encountered as a result of feeding raw pine sawdust to beef heifers during the last trimester of gestation.

Materials and Methods

Twelve Angus x Hereford crossbred heifers previously diagnosed to be approximately 6 months pregnant were randomly allotted to two pens of six each. Experimental rations consisted of either 20 pounds per head daily of grass-alfalfa loose hay or 20 pounds of a mixed ration consisting of 25% ground corn, 25% sawdust and 50% ground alfalfa hay starting December 24, 1970. These rations were calculated to be approximately equivalent in TDN and crude protein levels. Trace mineral salt and dicalcium phosphate (50-50) were provided free choice. Animals were weighed monthly; calves were weighed at birth and calving difficulty was rated on the following scores: 1, no difficulty; 2, slightly difficult; 3, difficult, mechanical calf puller needed; 4, extremely difficult. Animals were taken off treatment at calving or March 16, 1971, whichever occurred first.

Results and Discussion

No toxicity symptoms were observed during this trial. The first calf was born February 18 and the last calf on June 8. Two-thirds of the heifers had calved by March 16 when the sawdust feeding was terminated. The average calving date was March 23 and March 22 for the control and sawdust groups, respectively. One set of twins was born in the sawdust-fed group although not attributable to sawdust feeding. Both rations supported adequate weight gains during the period fed (table 1).

¹Study conducted at U.S. Irrigation and Dry Land Field Station, Newell, South Dakota.

No significant differences were noted in calving difficulty or calf birth weights (table 1).

Previous work at this station has shown no toxicity or intake problems when feeding 25% sawdust in silage or 20% sawdust in concentrate meal rations to feeder cattle (Slyter and Kamstra, 1971a). Five percent sawdust in high concentrate cattle finishing rations had no detrimental effects on either feedlot performance or carcasses produced (Slyter and Kamstra, 1971b). Kamstra and Minyard (1970) reported feeder cattle readily accepted pelleted rations containing 5 to 10% pine sawdust. Results of this study with pregnant animals are in agreement with those reported previously using feeder or finishing cattle, indicating no toxicity or intake problems at the levels fed. Slyter (unpublished data) encountered no adverse effects on conception of beef heifers as a result of previous sawdust treatment.

Summary and Conclusions

Feeding a ration containing 25% raw pine sawdust to first calf beef heifers during the last trimester of gestation resulted in no toxicity or intake problems. No differences were noted in calf birth weights or calving difficulty in heifers fed the control or sawdust rations. Based on these results, sawdust plus corn grain may provide an adequate substitute for hay in winter beef cattle rations.

Table 1. Weight Changes and Calving Results

Ration	Control	25% Sawdust
Number in lot	6	6
Avg. wt. 12-24-70	878.3	883.3
Avg. wt. 03-16-71 ^a	904.2	925.8
Avg. calving score ^b	1.7	2.3
Avg. birth wt. of calves	56.7	59.4 ^c

- ^a Weights included four heifers post-calving and two pre-calving in each lot.
^b Scored as follows: 1 = no difficulty; 2 = slightly difficult; 3 = difficult, calf puller needed; 4 = extremely difficult.
^c Includes one set of twins.

Literature Cited

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