EFFECT OF GRINDING ON THE NUTRITIVE VALUE OF GRAIN SORGHUMS FOR FATTENING STEER CALVES

Ed. F. Smith

Livestock feeders have often called attention to the large amount of sorghum grains passing through cattle when the whole grain is fed. Small hard grain, when not broken by chewing, seems to escape digestion altogether. The question, therefore, has arisen as to the best method of feeding grain sorghums for the most efficient utilization by fattening cattle.

In three experiments conducted at the Texas Station involving milo heads and threshed milo, it was found that for fattening calves followed by pigs, grinding threshed milo increased its value 41 per cent, and grinding milo heads increased their value 62 per cent. In experiments at the Kansas Station special silage (in which the grain was ground) was compared to normal silage. The special silage fed to calves during the winter produced in one experiment 12 per cent more gain than normal silage and in another experiment 19 per cent more gain.

As early as 1906 at this station ground kafir was found to be about equal in feeding value to corn and cob meal. Ground milo was about equal to ground kafir for fattening calves in an Oklahoma test, and cracked hegari was equal to rolled barley in two Arizona trials.

Experiments conducted at the Kansas Agricultural Experiment Station have shown that ground Wheatland, Westland, and Colby milo and Blackhull kafir compare favorably to ground corn for fattening cattle. To determine the value of grinding Atlas sorghum grain for dairy cows, a test was conducted at this station in which the feces were collected and washed to recover the grain voided. The results show that feeding whole grain resulted in excessive waste while coarse grinding was more satisfactory than fine grinding, considering the cost of grinding and consistency of the feed. For the check group of cows the recovery of grain in the feces averaged 42 per cent of whole grain, 4.8 per cent of coarsely ground, and 1.5 per cent of finely ground grain.

Table 1 shows the results of a digestion trial conducted at the Kansas Agricultural Experiment Station in 1941 in which whole Milo and ground Milo grain were fed with cottonseed meal to determine the effect of grinding on digestibility.

Table 1-- Effect of grinding Wheatland Milo

	Digestion Coefficients*				
	Dry matter	Crude protein	Ether extract	Crude fiber	N-free extract
Whole Milo C. S. meal	58.2	53.3	66.2	50.3	64.0
Ground Milo C. S. meal	67.3	54.2	70.3	42.3	76.6

* The average percentage of each nutrient digested in a feeding stuff is termed the digestion coefficient.

The digestibility of all the nutrients except crude fiber was increased by grinding. Digestibility of crude protein was increased, 1.1 per cent; ether extract or fat, 4.1 per cent; and nitrogen free extract, 12.6 per cent. Grinding decreased the digestibility of the fiber 8 per cent.

Thus there appears to be conclusive evidence that the grain sorghums should be ground for fattening cattle. Data are lacking, however, with reference to the degree of fineness that these grains should be ground for best results. In order to obtain information on this point, a feeding trial is in progress in which whole Milo, coarsely ground Milo, and finely ground Milo are being fed. Digestion coefficients for each ration will be determined during the course of the experiment.

Twelve grade Hereford steers purchased on the Kansas City market are being used in this feeding trial. Their average initial weight on March 18 was 468 pounds. They were started on a full feed of silage, 2 pounds of coarsely ground Milo, 1 pound of cottonseed meal, and one-tenth pound of ground limestone daily per steer. The Milo will be increased about 1 pound per head weekly until each steer is consuming about 8 pounds daily. Silage consumption obviously will be decreased as the grain is increased. After this initial feeding phase, which is necessary to get the steers on a full feed of grain, the digestion trial will be conducted. The steers are stanchioned in the nutrition barn.

When on a full feed of grain, 12 steers will be divided into three groups of four steers each. One group will receive a full feed of whole Milo as the grain portion of the ration, another coarsely ground Milo, and the third finely ground Milo. A chemical analysis of each feed will be made to determine the percentage of nutrients. The same amounts of weighed feed will be fed to each steer throughout the digestion trial, the feces voided will be collected, weighed, and representative samples analyzed. Digestion coefficients will be calculated to determine whether the degree of fineness of grinding affects nutritive value.

Following the digestion trial, the steers will be continued on full feed in order to observe differences in gains, if any, attributable to grinding the grain to different degrees of fineness.