

THE EFFECT OF SODIUM HYDROXIDE TREATMENT AND PHYSICAL PROCESSING  
OF WHOLE WHEAT GRAIN ON DISAPPEARANCE OF DRY MATTER  
FROM NYLON BAGS IN THE RUMEN OF SHEEP

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Treatment of grain with up to 4 per cent (w/w) NaOH can increase the digestibility of grain dry matter (DM) in ruminants (Ørskov 1979). Since NaOH treatment may provide an alternate means of processing to improve the digestibility of grains, we compared the effects of NaOH treatment and physical processing on the degradation characteristics of grain DM in nylon bags in the rumen of sheep.

Four treatments were compared: 1. whole-wheat, 2. whole-wheat treated with 4 per cent NaOH, 3. cracked wheat, or 4. wheat ground through a 1 mm<sup>2</sup> screen. Five nylon bags (pore size 40 x 60 µm) were prepared, each containing 5 g grain, for each treated grain and placed in the rumen of one of four sheep. Each grain treatment was tested in each sheep. The sheep were given (g/d) 300 oaten chaff, 300 wheat, 30 urea and 5 minerals. One bag was removed from each sheep at 3, 6, 12, 18 and 24 h after insertion, washed under tap water and dried at 70°. The proportion (%) of DM readily degradable in rumen fluid, the rate of degradation (h) of the more slowly degradable pool of DM, and the digestibility of DM after 24 h were calculated from the relationship between percentage of original DM remaining in the bag vs. time, as outlined by Kempton (1980).

Proportion of DM(%)	Grain Treatment				SE
	Whole	NaOH	Cracked	Ground	
Rapidly degradable	11 <sup>a</sup>	56 <sup>b</sup>	29 <sup>a</sup>	73 <sup>b</sup>	6.1
Slowly degradable	89 <sup>c</sup>	16 <sup>a</sup>	26 <sup>b</sup>	11 <sup>a</sup>	2.7
Digestibility (24 h)	20 <sup>a</sup>	89 <sup>b</sup>	88 <sup>b</sup>	94 <sup>b</sup>	5.2

Treatment of wheat grain with NaOH increased the digestibility of DM to the same extent as achieved by cracking or fine grinding. The increased digestibility due to NaOH treatment resulted from an increase in the proportion of grain DM readily degradable in rumen fluid, and a decrease in the proportion of DM which was degraded at a very slow rate (i.e. with a time for 50 per cent DM disappearance greater than 40 h).

KEMPTON, T.J. (1980). Trop. Anim. Prod. 5:107.

ØRSKOV, E.R. (1979). In 'Recent Advances In Animal Nutrition', p. 123, editors W. Haresign and D. Lewis (Butterworths: London).