

THE NUTRITIVE VALUE OF ALKALI-TREATED WHEATEN STRAW FED TO SHEEP WITH PROTEIN
SUPPLEMENTS OF EITHER LUPINS OR BARLEY AND UREA

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The dry matter digestibility of straw may be increased by treatment with sodium hydroxide (Fernandez Carmona and Greenhalgh 1972). However, if alkali-treated straw is to be prepared and fed in maintenance or production rations to livestock on southern Australian farms, the treated straw must be prepared by practical techniques involving the minimum of labour, and fed with protein supplements that can be readily obtained. This paper describes an experiment to compare the dry matter intake, digestibility and wool production by sheep fed untreated straw or alkali-treated straw either alone or supplemented with lupins or a mixture of barley and urea.

Windrows of wheaten straw (*Triticum aestivum* L. cv. Condor) were sprayed with water or a solution of sodium hydroxide at the rate of 7 g sodium hydroxide per 100 g straw. The straw was baled and stored under cover. Groups of eight Merino wethers were fed either untreated straw or alkali-treated straw either alone or supplemented with either 24.3% lupins or 25.7% barley and 1.5% urea. Minerals and vitamins were added to each diet. The supplemented diets contained nine per cent crude protein and the supplements provided equal amounts of digestible energy. The diets were fed for a 14-day pre-experimental period and 42 day test period. The results are shown in Table 1.

TABLE In vivo dry matter digestibility (DDM), dry matter intake, wool production and liveweight change by sheep fed the straw diets

	<u>In vivo</u> DDM (%)	Dry matter intake (g/day)	Wool growth (g/day)	Liveweight change (g/day)
Untreated straw	38.8	358	0.032	-0.13
Alkali-treated straw	42.7	387	0.037	-0.15
Untreated straw + lupins	51.5	598	0.061	-0.05
Alkali-treated straw + lupins	58.4	769	0.082	-0.03
Untreated straw + barley + urea	53.2	639	0.059	-0.07
Alkali-treated straw + barley + urea	56.7	847	0.085	0.00
LSD: 5% level	3.0	112	0.014	0.03

The increase in dry matter digestibility of the straw, as a result of alkali treatment, was not sufficient to significantly increase intake or wool production by sheep offered the unsupplemented straw diets. However, the higher digestible dry matter intake by sheep offered the supplemented alkali-treated straw diets compared to those offered the supplemented untreated straw diets resulted in higher wool production and lower liveweight loss. It may be concluded that although the production by sheep offered straw diets can be improved by spraying the straw in the paddock with sodium hydroxide solution, the economics of the system would have to be examined before it could be recommended to farmers.

FERNANDEZ CARMONA, J., and GREENHALGH, J.F.D. (1972). J. Agric. Sci., Camb. **78**: 477.

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