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# THE EFFECT OF BENTONITE CLAY ON FEED INTAKE, WOOL GROWTH AND LIVEWEIGHT GAIN IN SHEEP.

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Bentonite clays (montmorillonite-type clays) fed in rations have been found in some instances to produce increases in wool growth in sheep. In sheep fed oaten chaff (600 g/d) and in animals grazing green pasture, with bentonite added to the drinking water, Fenn and Leng (1989; 1990) reported increased wool growth. However in other experiments, the inclusion of bentonite has given no increase in wool growth. For example when wheat chaff (900 g/d) or a good quality pellet were fed to sheep (at 3.5% of liveweight) with any one of three different bentonites, the inclusion of the dry bentonite (25g/kg feed) did not have any significant effect on liveweight or wool growth (Murray et al. 1990).

The aim of this experiment was to determine the necessity of hydrating the bentonite, prior to introduction to the rumen, on subsequent wool growth and liveweight gain in sheep. The bentonite tested was Trufeed MW (Cudgen R. Z., Queensland) which was a similar clay to the bentonites used in the previous studies of Fenn and Leng (1989; 1990) and Murray et al. (1990) except for the addition of 1% soda ash. This was added to increase the swelling properties of the bentonite and thereby maintain it in suspension in the animal's drinking water.

Sixteen month old Merino wethers weighing 42.0 ± 0.5 kg (mean ± se) were used for the experiment. There were three treatment groups. Controls were fed wheat chaff without any bentonite (n = 30). The second group of sheep was fed wheat chaff with dry bentonite (20g/ kg chaff) (n = 17) and the third group (n = 17) was fed wheat chaff with hydrated bentonite in their drinking water. Sheep in the treatment groups fed the control wheat chaff and the wheat chaff with dry bentonite had free access to drinking water. The sheep fed the diets with the hydrated bentonite were given a bucket of drinking water containing 23.7g of bentonite (in 1.5 litres of water). Each day after animals in this treatment group had drunk the water containing the hydrated bentonite they were given free access to drinking water. Throughout the experiment, all animals were fed wheat chaff *ad libitum* with intakes recorded daily. The chaff was supplemented with a trace mineral-vitamin premix, urea (7 gN/kg feed) and ammonium sulphate (0.6 gS/kg feed). Animals were weighed weekly. Mid-side patches (15 x 10 cm) were cut four weeks after the start of the experiment and again after the sheep had been on their respective diets for eleven weeks. Rumen samples were taken by stomach tube before the start of the experiment and during the last week of the experiment. The data were analysed by analysis of variance. Feed intake was used as a covariate in the analysis of liveweight and wool growth.

| Treatment | Liveweight gain (g/d) | Clean wool growth (g/sq.m.d) | Chaff intake (kg/d) | Rumen protozoa ($x10^5$/ml) |
|---|---|---|---|---|
| Control | 42 ± 5 | 7.6 ± 0.3 | 1.34 ± 0.03 | 3.79±0.46 |
| Dry bentonite | 40 ± 6 | 8.4 ± 0.4 | 1.43 ± 0.04 | 4.04±0.41 |
| Hydrated bentonite | 46 ± 7 | 8.8 ± 0.4 | 1.42 ± 0.04 | 5.13±0.74 |
| F test | ns | (P<0.05) | (P<0.08) | ns |

In the sheep given the hydrated bentonite in their drinking water, wool growth was significantly increased (P<0.05) by 14.8% even after accounting for the effect of the increased intake of chaff. At the start of the experiment sheep had a mean of 5.23 ± 0.49 (mean ± se) x $10^5$ protozoa/ml of rumen fluid. It was concluded that part of the increases in wool growth reported in previous experiments with sheep given free access to feed may be due to greater feed intake.

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