

Utilisation of the waste product 'Delac' in cattle diets

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Delactose whey permeate (Delac) is a waste by-product from dairy factories producing lactose powder. Utilisation of Delac as an energy source in cattle diets would add value to this product and reduce or eliminate the costs associated with disposal. Delac contains 30 to 40% solids, the principle components being lactose and minerals. Monitoring of Delac has shown that average lactose content is 55.8% on a dry matter (DM) basis, with a range of 50.7 to 71.0%. A very similar product called PROLIQ is already being produced and fed to dairy herds in New Zealand.

An experiment was conducted to evaluate Delac as either a partial grain replacer in finishing rations or as an energy supplement to hay. Hereford steers ($n = 6$, initial liveweight 294 ± 26 kg) were offered roughage or 80% concentrate (barley + cottonseed meal) based diets *ad libitum* for 100 days. The roughage component of both diets consisted of a 50:50 lucerne and wheaten chaff mix. Concentrate was introduced as recommended by the NSW Feedlot Manual over a period of 25 days (Anon 1997). Delac was included in the diets at 0, 11.6, 23.2 and 34.8% of total dietary DM. It was introduced into the grain-based diets at the same rate and at the same time as the grain. Cattle on the roughage-based

diets were introduced to Delac at the equivalent rate to steers on the concentrate levels until the same four desired levels were reached. All diets were made isonitrogenous (150 g crude protein/kg DM) using cottonseed meal. During the experiment the steers were housed in individual pens in an animal house where they were fed once daily. DM intake and liveweight (LW) were recorded on a daily and weekly basis respectively, their means are shown in Table 1.

The results were analysed as a 4 x 2 factorial by analysis of variance. Intake increased with the proportion of Delac in the diet ($P < 0.05$, Table 1), and LW gain was higher on the concentrate-based diet ($P < 0.05$). The lack of any adverse effect of Delac on LW gain indicates that Delac can be used successfully as a partial grain replacer in finishing diets. The LW gain response to Delac on the roughage-based diet was inconsistent. The trend of a drop in intake and LW gain at the highest rate of Delac on the concentrate diets may reflect the high mineral load.

Anon (1997). The New South Wales Feedlot Manual. *NSW Agriculture, Orange*, pp. 13–18.

Table 1 The effect of Delac on liveweight gain and dry matter intake in Hereford steers fed either concentrate or roughage-based diets.

Dietary Delac (% DM)	Liveweight gain (kg/day)		DM intake (kg/day)	
	Concentrate	Roughage	Concentrate	Roughage
0.0	1.098 ^a	0.853 ^a	7.309 ^a	8.106 ^a
11.6	1.106 ^a	0.770 ^a	8.884 ^b	7.925 ^a
23.2	1.193 ^a	0.952 ^a	9.528 ^b	8.995 ^a
34.8	0.910 ^a	0.884 ^a	8.499 ^{ab}	9.014 ^a

^{ab}Values within columns with different superscripts differ significantly ($P < 0.05$).