USE OF MONENSIN CONTROLLED RELEASE CAPSULES IN FEEDLOT CATTLE FED LUPIN-HAY RATIONS

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Monensin, a carboxylic polyether ionophore, can improve the efficiency of production in growing ruminants. Daily gain in steers at pasture improved in a linear manner with monensin levels of 50 to 200 mg/hd.day. Part of the production effect of ionophores has been attributed to alteration of rumen function leading to increased molar proportions of propionate relative to acetate both *in vivo* and *in vitro.* In this paper, we present the first assessment of the efficacy of controlled release capsules as a means of delivering monensin in feedlot cattle fed a ration based on hay and lupins.

Twenty four yearling steers were selected at market, and allocated to 1 of 2 groups, control or monensin, according to ranked liveweights. Controlled release capsules (CRCs) based on commercial anti-bloat capsules (Elanco Animal Health) were inserted into the rumen of each steer. The CRCs for the monensin group contained 32 g monensin in a hexaglycerol distrearate matrix core, while the control group CRCs contained only the core material. The steers were fed a ration based on hay (60%) and lupins (40%) at a rate of 2.8% of mean liveweight for the group/day for 70 days and then 3% for a further 30 days. This ration supplied approximately 80 MJ of metabolisable energy/day and 14% protein. All animals were weighed every 10 days. Rumen contents (approximately 20 mL) were collected via stomach tube from 4 animals in each group 49 days after insertion of the CRCs. These rumen samples were analysed for acetic (C2) and propionic (C3) acids by gas chromatography. All steers were slaughtered at a commercial abattoir, and the dressed weight obtained. The CRCs were recovered from each steer and measured for the rate of release of monensin.

Feed intake was not depressed in the monensin treated group. The CRCs released monensin at a rate of 199.4 ± 4.6 mg/day over the 100 days of feeding. The starting liveweights, the liveweight gain, the dressed weight of carcase, and the acetate:propionate ratio are presented in the table. Monensin increased the liveweight gain by 5.7% (or 0.042 kg/day), but neither this difference nor the difference in dressed weight of carcase was significant. The slightly lower C2:C3 ratio in the monensin-treated group was not significantly different from controls.

Table 1. Mean (± SEM) liveweight gain (LWG), dressed weight of carcase, and ruminal acetate:propionate (C2:C3) ratio in steers given controlled release capsules containing monensin

Treatment	Starting LW(kg)	LWG after 100 days (kg)	Dressed weight (kg)	C2:C3 ratio
Control	284 (8.4)	72.9 (10.1)	199 (6.8)	4.60 (0.40)
Monensin	284 (7.4)	77.1 (7.7)	200 (4.5)	4.26 (0.43)

The difference in liveweight gain between control and monensin-CRC-treated cattle was similar to that reported in 3 of 5 trials testing monensin ruminal delivery devices in cattle grazing pasture (Parrott *et al.* 1990). These workers did not report dressed weights of carcase. There was a minimal effect of monensin, delivered from CRCs, on the C2:C3 ratio when assessed in these steers fed lupin and hay for 49 days. This was consistent with the very small effect of monensin on C2:C3 ratios in cattle grazing irrigated wheat pasture (Davenport *et al.*1989), but the proportion of acetate produced by these steers on lupin and hay rations was greater than for steers on irrigated wheat pasture. Thus monensin CRCs have produced similar liveweight gains and C2:C3 ratios in steers fed lupin and hay rations in this feedlot trial, as compared with grazing trials (Davenport *et al.* 1989; Parrott *et al.* 1990).

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