

FACTORS ASSOCIATED WITH NON-USABLE ESTIMATES OF FAECAL CHROMIUM CONCENTRATION USING THE CONTROLLED RELEASE DEVICE IN CATTLE

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The Captec Cattle Chrome[®] controlled release device (CRD) has provided researchers an accurate method of estimating faecal output of grazing cattle over a wide range of pastures (Barlow *et al.* 1988). However, a small number of these CRD's have failed to give a reliable estimate of faecal chromium concentration. In this paper we examine the factors associated with discarded or non usable estimates (non estimate) obtained in intake studies conducted as part of a Meat Research Corporation-funded twinning project at Grafton, New South Wales.

Between 1991 and 1993, 697 CRD's (of the second type, released in 1991 by Captec) were used on a herd of 180 Angus x Hereford cows to estimate faecal output. These cows had liveweight ranging from 394-712 kg and were carrying, or rearing, either single or twin calves. The cows grazed a summer pasture of kikuyu grass, paspalum, Rhodes grass and couch grass with an estimated digestibility from 65-75%, and a winter pasture of irrigated ryegrass with a digestibility from 75-85%. An experienced operator was used to dose the cows with the CRD's. Only 7 CRD's were regurgitated at or shortly after dosing; these were successfully redosed. Estimates were made at late pregnancy, early, mid and late lactation, from cows at stocking rates ranging from 1.9-3.8 cows/ha.

There were 66 non estimates (9.4%) from the 697 CRD's. Forty of these CRD's were recovered from the pasture within 2-10 days of dosing and the cows from which the CRD's came had little detectable faecal Cr. Of the other 26 non estimates 6 gave high faecal Cr on day 7 of faeces sampling and low readings subsequently. This pattern suggests there was damage to the CRD. The 66 non estimates were confined to 19 cows. Eight of the cows (dosed 3 or more times) failed to retain 50% of the CRD's, indicating that particular cows were at fault.

A preliminary analysis of the factors including ^{cow} liveweight, physiological stage, rearing a single or twin calf, stocking rate, pasture digestibility and dosing order did not indicate a significant effect on CRD failure; further analyses, using a logistic regression of the factors, are in progress. However, there were certain trends. Cows rearing twin calves and which gave non estimates were heavier (mean liveweight \pm s.e.) than cows providing a usable estimate (573 v 549 \pm 44.0 kg). The proportion of non estimates was also higher in cows in early compared to late lactation, or during pregnancy (Table 1), which was possibly a consequence of a higher intake associated with early lactation (D.W. Hennessy unpublished).

Table 1. Effect of physiological stage and liveweight (kg; mean) on the proportions of usable estimates (%; mean) of faecal output

Stage	No. of years sampled	No. of CRD's used	% Non estimates	Cow liveweight	
				Usable estimates	Non estimates
Late pregnancy	3	148	7 (7.1) ^A	563 (38.0) ^A	586 (46.5) ^A
Early lactation	2	214	13 (2.7)	556 (47.4)	575 (31.0)
Mid lactation	2	148	7 (1.7)	550 (33.3)	576 (36.4)
Late lactation	1	122	6	546 (68.0)	640 (66.0)
^A Values in parentheses are s.e.m.					

There were 9.4% of the 697 estimates discarded over a period of 2 years. However, there were no factors identified which could reduce loss. From our observations we believe that the CRD allows reliable estimates of faecal output in beef cows up to 700 kg, over a range of pasture types.

BARLOW, R., ELLIS, K.J., WILLIAMSON, P.J., COSTIGAN, P., STEPHENSON, P.D., ROSE, G. and MEARS, P.T. (1988). *J. Agric. Sci., Camb.* 110: 217-3 1.