THE USE OF SLOW RELEASE CHROMIC OXIDE (Cr₂O₃) CAPSULES TO EXAMINE THE RELATIONSHIP BETWEEN FEED INTAKE AND FAECAL Cr₂O₃

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The use of continuous release is one method of administering an indigestible marker in order to determine daily faecal output and hence intake of grazing animals (Bird et al., 1984). In this study chromic oxide (Cr₂O₃) (Captec Chrome, NuFarm Ltd, Laverton, North Victoria) continuous release capsules were used to examine the relationships between feed intake and Cr₂O₃ concentration in faecal organic matter (CROOM) in cattle.

Twenty one Hereford heifers were randomly allocated on stratified live weight to three groups and fed at either maintenance (M), M x 1.5 or M x 2 calculated on initial live weight (MAFF 1976). The ration comprised 50% lucerne cubes and 50% triticale grain, all animals being housed on bare dirt feedlots and individually fed in troughs at 1000 hours using electronic feeding doors. After 14 days on the ration, all animals were dosed with the capsules (Day 0) and individual faecal samples taken between 0800 and 0900 hours on days 0, 3, 6, 8, 10, 13, 16, 18, 19, 20, 21, 22, 23 and 24. On days 10, 13 and 16, samples were also collected between 1500 and 1600 hours.

Regression analysis of data collected between days 6 and 22 inclusive included terms to account for nested random effects of animal, date and error, and for fixed effects of AM/PM measurement, and animal size. Several model terms proved non significant and the following model was adopted: CROOM = exp(constant + animal + error)/intake, for which the geometric mean is CROOM = 5324/intake.

Within animal (or error) variation, (variance component (VC) 0.120) was large relative to variation between animals (VC 0.0134), and total variation was high, decreasing with magnitude of intake (constant CV 36%). Recycling of Cr₂O₃ was unlikely because faecal ash (%DM) was similar in groups M and M x 2 (22.9 and 19.1 respectively), and the intercepts of the regressions of Cr₂O₃ (ppm in DM) v faecal ash for days 6-16 and 20-24 were similar in group M (480 v 464). Based on the above model, we conclude that to predict feed intake of a herd to within 10% accuracy with 95% confidence, 94, 38 or 18 animals per group would be needed depending on whether 1, 3 or 10 faecal samples are taken per animal. If estimates of digestibility and Cr₂O₃ release rates were available for each animal the precision of prediction may be improved (see Bird et al. 1984).


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