VALIDATION OF THE CAMDAIRY MODEL FOR PREDICTING MILK PRODUCTION OF GRAZING COWS

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CamDairy is a computer model designed to predict milk production, identify limiting nutrients and calculate rations which maximise profit (Hulme et al. 1986). In order to validate the model, monthly visits were made to a dairy farm near Camden, in SE NSW, over a three year period. Intakes of pasture, hay and concentrates were measured. Pastures were strip grazed by a herd of 95 Holstein Friesian cows. In most months, back grazing was not prevented, and some is likely to have occurred. Pasture quantity was estimated with an electronic pasture probe which was calibrated monthly. Pasture intake was estimated from the difference in dry matter present before and after grazing. Samples of pasture were clipped with electric shears, weighed, and dried. Samples of all feeds were analysed by near infra-red spectroscopy for energy and crude protein, and by plasma-emission spectroscopy for ten minerals. Measurements of milk output, bodyweight, and condition score were collected, and grouped according to three successive stages of lactation. The proportion of heifers in each group was recorded.

The feed and animal data were inserted into the CamDairy model which was used to predict milk production from three groups of cows for each of 23 monthly observations. These predictions were compared with actual milk production by linear regression analysis.

PREDICTED AND ACTUAL MILK PRODUCTION (L)

Stage of Lactation	Predicted	Actual	Difference	% Diff
Early	22.6	24.5	1.9	7.7%
Mid	18.3	19.4	1.1	5.7%
Late	13.1	15.0	1.9	12.7%

Milk Yield (litres) = 0.80*(Predicted milk yield) + 5.27 $r^2 = 0.69$ n = 69

Predictions within 5.7- 12.7% of actual yields were considered reasonable, in view of the difficulties of estimating pasture intake. Reasons for the positive intercept may include:
- underestimation of the amount of pasture actually eaten, principally back grazing.
- overestimation of the maintenance requirement.

These and other factors are being considered in the current development program which aims to improve predictive functions in the model, with inclusion of mechanistic modules where appropriate.

HULME, D.J., KELLAWAY, R.C., BOOTH, P.J. and BENNETT, L. (1986). Agric. Systems 22 : 81.

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