

Grassland Science Department

Title

Modelling dairy cow grass DMI to improve dairy cow performance

Abstract

Grass dry matter intake (GDMI) is possibly the single most important factor influencing milk production in grazing dairy cows (Wilkins, 2004). In Ireland the dairy industry is based on spring calving dairy cows converting grazed grass to milk. Grazed grass makes a large contribution to the total diet of the spring calving dairy cow (Dillon et al., 1995).

Currently dairy farmers do not have accurate GDMI estimates for the cows on their farm. This results in farmers making decisions with regard to sward and grazing management with no information on the critical factor influencing milk production on their farm, namely the GDMI of the cows in their herd.

One of the major constraints to achieving higher animal performance from grass-based systems is the difficulty in achieving high DMI from grazed grass. Previous work suggests that the majority of the reduction in performance of grass-fed compared to TMR-fed cows is due to the lower DMI exhibited by grass-fed cows in comparison to their TMR-fed counterparts (Kolver and Muller, 1998). In grazing systems the animal plant interface is critical to optimize DMI and thus animal performance. Animal effects such as breed, milk production potential and bodyweight interact with sward characteristics such as green leaf proportion, herbage mass and sward density to have a major effect on dairy cow grass DMI and performance.

As part of RMIS 5793 (RSF07526) a model to predict GDMI of Irish grazing dairy cows was validated. The project described below will further adapt that model, for example to incorporate the proven difference between the intake capacity of different dairy cow breeds (Prendiville et al., 2009) and to reflect the effects of new grazing management techniques such as on-off grazing (Kennedy et al., 2009). The model will also be utilised in order to improve decision-making at farm level in terms of more accurate concentrate supplementation regimes and grazing management decisions, e.g. herbage allowance at different stocking rates. A dairy herd will be set up in order to demonstrate the maximum milk production possible from a grass-only diet. In addition, a database of DMI and related animal and grass variables will be interrogated in order to answer some key questions on performance and efficiency from grass-based systems. The objective of the proposed project is to improve the estimation of dairy cow GDMI and as a result to improve the production performance of dairy cows at farm level.

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Programme/Subprogramme/RMIS Number:

AGRIP – Moorepark Grassland Science-Grass Feed & Value-6194

Start Date: 01/01/12 **End Date:** 31/12/16