

TEAGASC GRANGE: M. McGee *et al.*

Beef Nutrition

Feed Efficiency in Beef Cattle

Feed provision is the largest variable cost in beef production systems. Consequently, feed efficient animals are central to profitable, sustainable and efficient Irish beef production. Teagasc research on feed efficiency has shown that in any group of growing cattle (or suckler cows) there can be up to 20% difference in the feed consumed by the most efficient cohort compared to the least efficient cohort of animals for the same level of growth and performance. In Ireland and elsewhere, breeding values of bulls for feed intake or feed efficiency are typically derived from progeny performance based on *ad libitum* access to energy dense, high concentrate rations whereas, the lifetime gain of most commercial beef cattle is achieved from diets consisting, to a significant extent, of lower energy density feeds such as grazed grass and/or ensiled forages. There is evidence from our own work, and that of others, that although somewhat repeatable, ranking of beef cattle for feed efficiency offered the same diet is not necessarily consistent over different phases of their lifetime, and this may be further exacerbated when diets differing in energy density are fed successively (i.e. forage versus concentrate based diets), as per commercial practice. This strongly indicates the presence of what is termed a 'genotype × environment' interaction for the trait, in other words that the relative feed efficiency of a particular animal depends on the type of feed it is offered or management system within which it is reared.

A large study is on-going at Teagasc, Grange to examine the existence of genotype × environment interactions and the repeatability of feed efficiency measures (including residual feed intake - RFI) in growing beef cattle both within and across diet types i.e. concentrates, grass silage and grazed grass.

Additionally, as a major constraint to genetic progress in feed efficiency is the difficulty and enormous expense of measuring it directly, robust cost-effective molecular-based biomarkers of feed efficiency are necessary. This study will also provide novel biological data and samples for identifying the key genes controlling the trait so that such information can ultimately be incorporated into the planned genomic selection based breeding programme for beef cattle in Ireland [SEE ELSEWHERE].

Funded by the Irish Department of Agriculture, Food and the Marine.