Research to improve the efficiency of winter feeding

If our industry is to remain competitive when competing within global dairy markets, a continued and relentless focus on improving all aspects of production efficiency is required. This is especially true within the current context of high feed costs and volatile milk prices. As feed costs represent the main variable cost on dairy farms, feeding strategies must be adopted to maximise the value of each kg of food offered. In addition, the increasing yield potential of our dairy herds has created many new challenges, and research is currently underway to fill knowledge gaps in relation to dairy cow feeding strategies. These challenges are being met through an integrated research and development partnership in which AFBI, AgriSearch and CAFRE are actively involved in research programmes and knowledge transfer events, both at AFBI and CAFRE sites, and on farms across Northern Ireland. Most of this research is co-funded by DARD and AgriSearch. This, the fourth article in this series, has been prepared by Ryan Law and Conrad Ferris from AFBI Hillsborough.

Know your forage quality and quantity

The outcomes of research undertaken during the last few decades are central to many of the feeding decisions made on a daily basis on farms across Northern Ireland. For example, feed rationing programmes used by advisers and many within the feed industry have been developed from research, including major studies carried out at AFBI Hillsborough. However, in order to harness the benefits of any of these programmes the first requirement is to know the quality of the silage available. This is especially true in view of the wet summer of 2012 which has left a legacy of fodder shortages and poor quality silage on many farms. Initial results for first and second cut silage samples analysed within the Hillsborough Feeding Information System (HFIS) this year suggest that protein levels, digestibility, intake potential and the milk yield potential of the samples are considerably lower than during 2011. If you have not already done so, then take the first step in managing feeding on your farm this winter by assessing the quantity of silage available for your herd, and by having a representative sample of each silage analysed.

Examining a new approach to early lactation feeding

CAFRE benchmarking data indicates that the average concentrate input on benchmarked dairy herds in Northern Ireland increased from approximately 1.1 to 2.1 tonnes/cow/year between 1998 and 2008. There are a number of reasons for this. Firstly, as the milk yield potential of the Northern Ireland dairy herd has increased, concentrate feed levels have also increased in an attempt to meet the higher nutrient requirements of these cows. In addition, the huge expansion in milk production in Northern Ireland during the last few decades has largely been achieved from increased concentrate feeding, the land base available to many farms having remained relatively static. However, higher milk yields in early lactation, combined with higher concentrate feed levels, may increase negative energy balance, metabolic stress and the risk of digestive upsets.

To help tackle these problems researchers from AFBI-Hillsborough are currently examining an alternative approach to early lactation feeding which involves a more gradual build up in concentrate feed levels in early lactation. For example, in one of the studies undertaken to date, one group of cows were managed on a rapid concentrate build up strategy and were offered their full concentrate feed level by day-10 post calving, while the other group was managed on a slow build up strategy, and was not offered its full concentrate feed level until day-42 post calving. As part of the latter strategy, the diet offered had a lower protein content.

Cows on the slower build-up treatment had a higher forage intake in early lactation (during the period before the additional concentrates were offered), and continued to maintain this higher forage intake throughout the entire experiment. As a result, cows on the slower build up strategy had a much lower incidence of rumen health problems than those on the rapid build up strategy. However, neither total dry matter intake, milk yield nor milk composition was affected by concentrate build-up strategy, although cows on the slow build up treatment produced less milk during weeks 3 - 7 post calving than those on the rapid build-up treatment (Figure 1). In addition, cows on the slow build-up treatment returned to positive energy balance earlier (week-7 post calving) than those on the rapid build-up treatment (week-19 post calving). Thus the results of this study clearly demonstrate that a slower build up of concentrates in early lactation, combined with a lower protein diet, can result in improved rumen health and higher forage intakes. This study is now about to be

repeated on a small number of commercial farms so as to provide robust information on the effect of this novel feeding strategy on fertility.

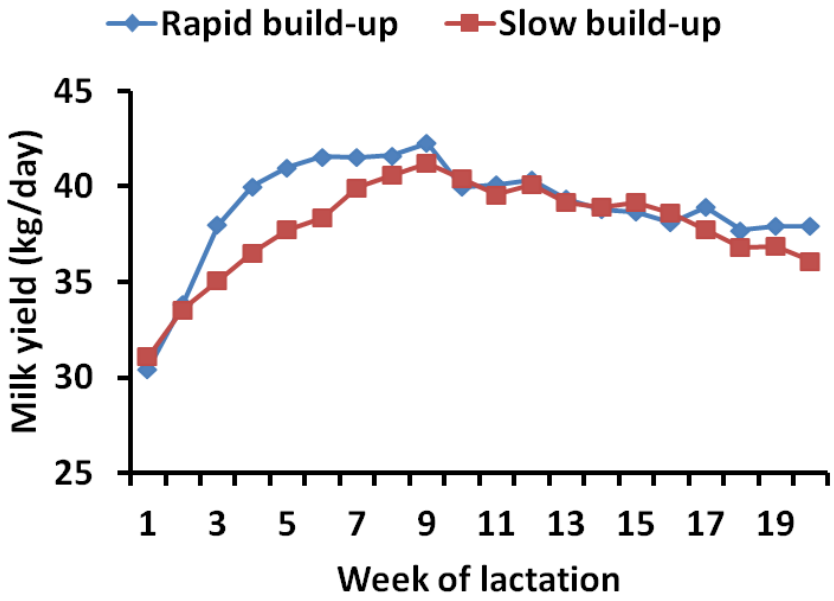

Figure 1 Milk yield during the first 150 days of lactation for cows managed on either a rapid or slow concentrate build up strategy in early lactation.

Identifying optimum concentrate feeding strategies

As concentrate feed costs now represent between 60 – 70% of variable costs on Northern Ireland dairy farms, it is essential that each kg of concentrate offered is utilised with a high level of efficiency. To address this issue, four different concentrate allocation strategies were examined in a recent Hillsborough study. A key objective of this study was to ensure that total concentrate inputs over the first 150 days of lactation were equal with all four feeding strategies. Briefly, the feeding strategies examined can be described as follows:

1) Complete diet: 12 kg concentrate/cow/day flat rate
2) Out-of-parlour feeder: 12 kg concentrate/cow/day flat rate
3) Out-of-parlour feeder: feed to yield, with an average of 12 kg concentrate/cow/day over the first 150 days of lactation
4) Same as 3 above, except part of concentrate offered in a basal diet.

Preliminary results from this experiment highlight that feeding system had little effect on either food intake or milk production (Figure 2). Thus it would appear that provided the herd as a whole is fed according to its nutrient requirements for milk production, concentrate allocation strategy (either flat rate or feed to yield) will have relatively little effect on animal performance. The key message from this work to date is that many feeding systems can be equally effective, provided cows are not overfed. Nevertheless, overfeeding and inefficient use of concentrates would appear to remain a significant issue on many local farms. This work is now being further developed to provide a better understanding of how individual cows respond within feed to yield systems.

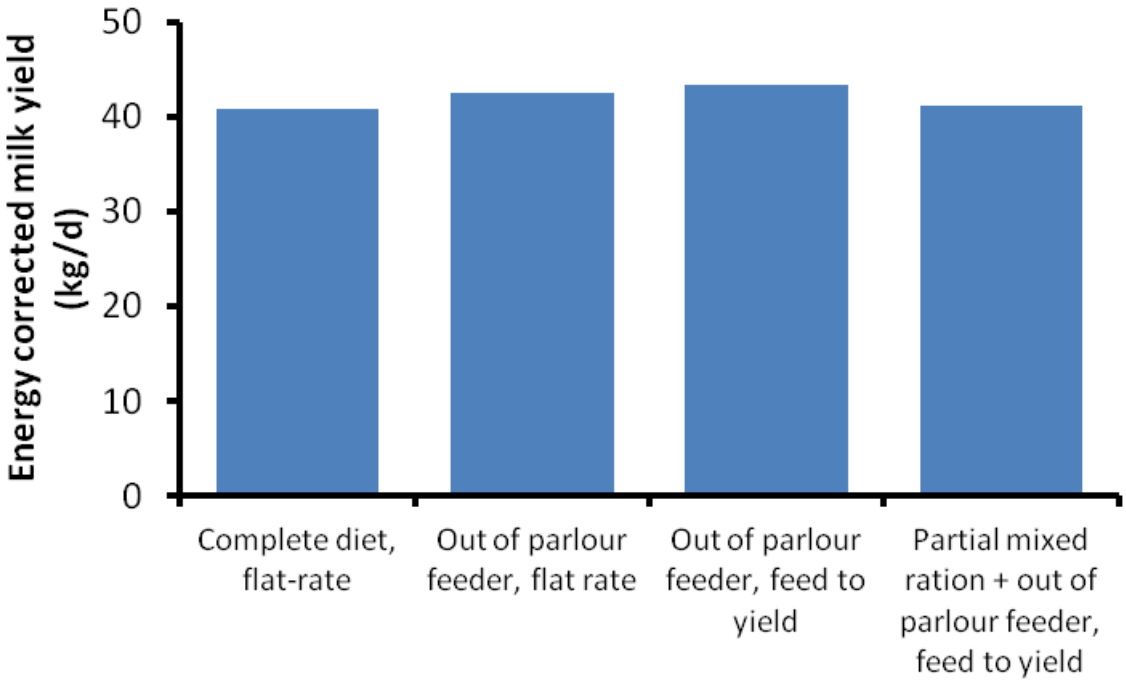

Figure 2 Milk yield during the first 150 days of lactation for cows managed on four different concentrate allocation strategies in early lactation.

Conclusions

To remain competitive, a continued and relentless focus on improving all aspects of production efficiency is required. Know the quality of silage available on your farm this winter, and seek to get maximum benefit from each kg of concentrate fed.

The results of these studies will be presented during a series of farm walks which are being organised by AFBI, CAFRE and AgriSearch. These walks will take place on the farms of Mr Conor Casey, Cloughmills (31st October), Mr Brian Matthews, Donaghcloney (1st November) and Mr Adrian Houston, Plumbridge (2nd November). See press for details of events.