



Improving feed conversion efficiency

Here, in the first of a series of articles looking at feed conversion efficiency, we explain why the parameter is set to become increasingly important for UK dairy businesses and how it can be improved

Topic 1: **What is FCE and why is it so important?**

Topic 2: **Health and FCE – a holistic approach**

Topic 3: **Breeding for FCE**

Topic 4: **Non-feed and management factors**

Topic 5: **'Chemical' and 'physical' ration factors**

Pushing feed conversion efficiency – not yields – is key to sustainability and profitability

The same feed – but more milk

Keenan recently hosted a timely global summit that focused on feed efficiency and food sustainability and pulled together the thoughts and views of some of the world's leading dairy nutritionists and economists.

text **Rachael Porter**

Rising feeds costs – which are set to remain high – are just one of a handful of challenges that are focusing producers' minds on increasing efficiency. Achieving even small improvements in feed conversion efficiency can help UK producers to lessen the impact of declining milk prices and increasing feed costs, according to nutritionists and economists across the world. "FCE is the weight of milk produced for

each kilogramme of feed dry matter consumed and the ultimate measure of a dairy herd's technical performance because it reflects the efficiency with which the cow converts the feed it consumes – forages and concentrates – into milk," says BOCM PAULS Wyn Morris.

The company is working closely with Keenan, which instigated and is driving an initiative, to 'roll out' its feed

conversion efficiency (FCE) 'concept' to dairy producers. "Increasing dairy feed efficiency is the focus," explains Keenan's David Beever. "Producing more milk from the same feed is a paradigm shift that challenges conventional thinking and its financial effect is major.

"A feed efficiency gain of 25% is worth £63,000 to a 150-cow UK herd. So at a national and global level the accumulated economic potential is massive."

group	days in milk	FCE (kg milk/kg DMI)
one group, all cows	150 to 225	1.4 to 1.6
1st lactation	<90	1.5 to 1.6
1st lactation	>200	1.2 to 1.3
2nd+ lactation	<90	1.6 to 1.8
2nd+ lactation	>200	1.3 to 1.2
fresh cow group	<21	1.1 to 1.2
problem herds	150 to 200	<1.3

Table 1: Feed efficiency targets for cows in different groups/period of production (Source: SCA NuTec)

He says it's all about putting the correct 'chemical' and 'physical' ration in front of the cow and feeding the rumen, in other words ensuring that the diet is fed in a form that promotes optimal rumen function and allows the cow to produce as much milk as possible from the feed – good feed conversion efficiency.

Significant improvements

"Achieving improvements in this key performance indicator (KPI) will help producers to combat the impact of these margin-squeezing factors, without adversely impacting either milk production or herd health," adds Dr Morris.

"Although pig and poultry producers have used FCE to benchmark performance for many years the dairy sector has not yet followed their lead. We believe that

this is set to change because feed is now the largest single cost involved in producing milk and has the greatest impact on herd profitability. Achieving even modest improvements can therefore have a dramatic positive impact on 'bottom line' financial performance.

"Studies we conducted with Keenan demonstrated a wide range in FCE performance, with average herds achieving a figure of 1.18 and the top-performers 1.66. These enormous differences demonstrate that there is potential for average herds to achieve significant improvements," he says.

Another study, by Promar, highlighted the range in performance at any given level of output. Herds feeding 3,000kg of concentrates per cow per annum produced between 6,000 litres and 9,000 litres of milk per cow – a 50% difference. At 24ppl this equates to £720 in additional milk income per cow per year for the same feed cost, or a massive £93,600 for the average 130-cow herd, a figure which is impossible to ignore.

"FCE tends to improve with increasing energy density in the ration and with higher milk output because the proportion of the overall energy supply required for maintenance decreases relative to the total," says Dr Morris. "Feed costs generally decline as FCE increases, but even at 1.2kg of milk per kg of feed they vary from 6ppl to almost 10ppl. Improving FCE from 1.2 to 1.3 therefore increases the milk production of an 8000-litre cow by 8.5%, or reduces the amount of feed needed to support this yield by over 1kg DMI/day."

Total approach

To help producers to improve the FCE of their herds, BOCM PAULS has a system that incorporates the company's total approach to nutrition. This highlights current performance, tracks progression to target and takes into account parameters such as the number of milking cows in the group, milk quality and price, together with average daily production. It also includes the type, dry matter and cost of all feedstuffs, ration details, and feed that is not consumed, which helps to determine current efficiency and identify the potential financial value of improvements.

And adopting Keenan's Mech-fiber system, either partially or fully, will also increase FCE. It works because it integrates existing chemical nutrition science with emerging physical nutrition science within a carefully designed

Tips to increase feed efficiency

- Providing a consistent and properly balanced ration, improving forage digestibility
 - Improving NDF digestibility
 - Providing adequate effective fibre
 - Stimulating fermentation of rumen
 - Minimising ration sorting
 - Utilising feed additives (rumen buffers, fibre digesters, silage inoculants)
 - Modulate rumen pH (prevent SARA and reduce risk of developing metabolic disease)
- (Source: Provimi)

set of best management practices. It acknowledges that FCE requires a holistic approach, and not merely a nutritional one. The very best ration tailored to a herd's requirement simply won't cut it if trough space or cow comfort are inadequate, for example. Or if cows are too lame to get up and feed.

SCA NuTec highlights other benefits to increasing FCE. "There would be a lower cost per unit of milk produced by feeding closer to the cow's nutrient requirements," says the company's Norman Downey. "But another benefit would be reduced excretion of excess nutrients such as nitrogen and phosphorous."

He adds that feed efficiency can be improved by increasing milk production and/or solids in milk. That means production enhancements, such as three-times-a-day milking and feed additives and feeding fat, would increase efficiency. "Improving forage quality can also be effective, as can grouping cows. Feeding closer to their nutrient requirements will result in increased efficiency." He adds that when monitoring a herd or group of cows the composition of the group can also have an effect (see Table 1).

A feed efficiency value greater than 1.7 would be considered excellent, while a value less than 1.3 may suggest that something is amiss. When feed efficiency values approach 2.0, it is important to observe cows to insure that they are not losing excessive amounts of body condition.

Particularly high feed efficiency values may be a sign that cows are relying too heavily on body reserves to support high levels of milk production. |



KPI: Keenan says that improving FCE should be the focus of UK dairy businesses