



#### Reducing your carbon footprint

This comprehensive series aims to offer producers clear and practical information to help them increase efficiency and save money. It highlights affordable and effective methods to reduce greenhouse gas emissions on UK dairy units.

Topic 1: Cutting through the 'carbon jargon'

Topic 2: Fewer emissions from farm waste

Topic 3: Improving feed efficiency

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Topic 6: Get water wise

Maximise feed efficiency to cut costs, increase yields and reduce emissions

# More milk – less waste

There are huge financial rewards for every dairy business that strives to improve feed efficiency. And a more efficient business is also one with a smaller carbon footprint. We offer some practical tips and pointers on how to maximise milk from feed.

text Rachael Porter

Striving to maximise feed efficiency is something that all dairy producers should be doing. Most already are, according to DairyCo's nutritionist Adam Clay. "And that's without a thinking about their business' carbon footprint – they're doing it because it's the best way to maximise productivity and profitability."

So the good news here is that any pressure to reduce the carbon footprint comes with a financial reward – a considerably large one for some herds. "This is something that producers can do for their businesses and their bottom lines. And I think that's why this is an area that most producers are eager to examine and tackle in terms of reducing their herd's emissions," says Mr Clay.

#### Basic rules

And he has more good news. Maximising feed conversion efficiency – or litres of milk produced per kilogramme of dry matter fed – doesn't require huge capital investment. Improvements can be made on most units by simple paying a little more attention to detail and observing and monitoring herd performance.

A few basic, and some may say obvious, rules – but rules that are yet to be applied on a surprisingly large number of units – including feeding to a cow's individual requirements and making sure that the



## Home-grown feeds are key to reducing carbon footprint

The biggest single thing producers can do to their herd's feeding system to reduce their carbon footprint is to ensure they make maximum use of home grown feeds, according to Biotal's Roy Eastlake.

"There's a lot of on-going research into reducing methane output, but the simple truth is that carbon footprint reduction begins at home with the production of high quality, digestible and palatable forages and concentrates," he says.

"Forage crops are now available including legumes that, with the targeted use of slurry and manure, should be able to produce high yields of forage and reduce inputs of expensive artificial fertilisers. And, provided the crops are cut at the right time and are well-preserved, there is no reason why high intakes can not be achieved.

"This maintains both a stable rumen

environment and production levels with feed conversion efficiency. This will, in turn, reduce the requirements for purchased feeds."

He adds that it is the imported ingredients in purchased feeds that have the high carbon footprints.

"We have to look at the environmental impact of growing soya and palm oil on land that was previously rain forest and then transporting these crops half way around the world to feed it to dairy cows. And then compare this to the impact of growing silage and concentrate feeds on farm.

"The good news is that there is still considerable scope to improve the production and preservation of home-grown forages and the use of probiotics, such as live yeasts, can help to increase the utilisation of those feeds," says Mr Eastlake.



forage-to-concentrate ratio is suited to her stage of lactation.

"Splitting the herd into feeding groups and using in- or out-of-parlour feeders will help to ensure that individual nutritional needs are met," he says. "It's all about energy – making sure that cows' intakes are sufficient for milk yield and to maintain body condition. That's a tall order in early lactation."

Minimising the inevitable negative energy balance post calving is essential. Not only does excessive weight loss impact on cow health and fertility, it's also inefficient. The cow gains 28MJ/kg of energy from the body weight she loses, but it requires 32MJ to put each kilogramme back on.

#### Rumen pH

The forage-to-concentrate ratio should promote a stable rumen pH and optimise rumen function in order to maximise feed conversion efficiency (FCE).

"And there's more to maximising efficiency than simply providing a consistent and balanced ration. The physical composition of the ration is also vital – particle size has to be correct to prevent cows from sorting forage from concentrate portions at the feed fence," says Mr Clay.

Fibre is digested by the rumen bacteria at a pH of between 6 and 6.5. Starch and sugars digesting bacteria require a slightly more acidic 5.5. "The trick is to avoid fluctuations, which will reduce

the amount of energy and protein that the rumen bugs breakdown and, therefore, reduce the FCE."

There are yeasts and rumen buffers that can be added to rations to help achieve this stability.

Adding live yeast stabilises the rumen by reducing the oxygen content of the rumen gases. "More efficient bacteria will maximise the value and effect of the available feed," says James Brinicombe from Devon-based feed manufacturer Denis Brinicombe.

But Adam Clay stresses that producers should get the basics of the ration right – both in terms of its nutrients and composition – before turning to such feed additives.

"In a situation where a problem persists, perhaps in a scenario where there's an acidic silage, then they may have role." Monitoring the performance of the ration – or rather the herd – is another way to ensure that feed efficiency is being maximised.

"Cow performance is the first indicator that the ration you have on paper and the one you put in front of them are one and the same. You're looking for at least 1.2kg of milk per kilogramme of dry matter consumed – a FCE of between 1.6 and 1.7 would be very good.

"And it's worth monitoring this figure as just a 0.1 increase in FCE can make a big difference to the milk cheque and your margins. For an dairy herd averaging 8,000 litres, a FCE increase from 1.2 to 1.3

will increase milk production by 8.5% with no extra feed costs – just less waste."

#### Feed-barrier space

Other factors that can limit the efficiency of a perfectly good ration include insufficient feed barrier space – the recommendation is to allow at least 0.75m per cow. Neck rails should also be checked for cow comfort and there should be plenty of space in the feed passage for cows to pass behind other feeding cows. "And lying space is crucial too, since this encourages blood flow to the udder. Cows should be lying down for between 14 and 16 hours a day," says Mr Clay.

"Studies have shown that cows produce a litre of milk for every hour they're laying down. So if your herd only rests for nine hours, that's a potential loss of about five litres per day – that's a lot of milk even for smaller herds."

There's no 'silver bullet' to ensure that your herd's FCE is maximised and that its carbon footprint in terms of feed use is kept to a minimum. "There's no one thing that herds with good FCEs are doing to improve feed efficiency. It's a combination of a number of factors," explains Mr Clay.

"And while this combination will vary depending on the management system in place, one thing that all efficient herds have in common is that they're businesses that are reducing emissions and making a profit." |