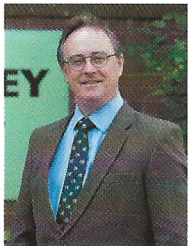


Protein feeding for greater sustainability

Reducing protein wastage and improving the use of dietary nitrogen can help the environment, boost dairy herd sustainability and reduce the costs of milk production.



David Wilde

With all the focus on carbon dioxide and methane reductions as the means to increasing the environmental sustainability of milk production, nitrogen, and protein, has slipped under the radar.

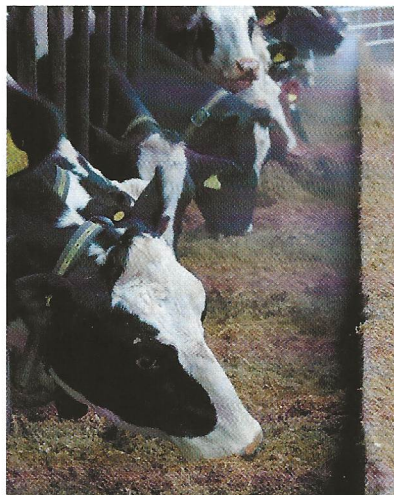
However, David Wilde, National Ruminant Technical Manager with Massey Harpers Feeds believes taking a closer look at protein feeding could have big benefits for environmental and economic sustainability of dairy farms.

“Nitrogen is a significant contributor to the environmental cost of dairy farms, either through emissions such as nitrous oxide or diffuse pollution of rivers,” he comments. “Nitrogen is excreted in faeces and urine and while some will be recycled as plant nutrients a significant proportion is wasted which has an economic cost.

“Most of the focus on nitrogen has been around sources of protein, primarily the drive to feed less or zero soya and we were the first feed company to introduce zero soya compounds and mixes. But the biggest issue is that many UK diets tend to be high in protein, regardless of source, and cows just don’t make very good use of it.

He explained that at the heart of the problem is how efficiently cows use protein. Nitrogen use efficiency (NUE) is the percentage of nitrogen fed that is captured as milk protein which is the UK averages around 25%. Any protein that isn’t utilised is excreted.

“In the UK, winter dairy diets are typically around 17% protein. If a cow is eating 25 kgDM/day she will be fed 4.25kg of protein. If NUE is only 25%, this means that only 1kg of this protein will end up in the milk, the other 3.25kg being excreted. For a 200-cow herd this could amount to around 170 tonnes of protein per year that is going in the mouth and passing straight through. At current protein prices this represents a major drain on profitability as well as causing significant environmental damage.”



There is scope to reduce the protein content in UK dairy diets

Wilde comments that it should be possible for all herds in the UK to increase nitrogen use efficiency to improve the overall sustainability of their system. He says that in many other leading dairy nations, NUE can be nearer to 30-35%. “We need to get better at matching supply and demand when formulating diets by rationing cows to metabolisable protein (MP),” he continues.

“Typical dairy rations formulated to 17 - 18% crude protein, results in cows often being over-supplied degradable protein which is wasteful and ends up in the urine. There are many examples of herds across Europe, the US and elsewhere with cows fed rations as low as 15-16% CP, which demonstrates the size of the opportunity. It is perfectly possible to meet metabolisable protein

required from a lower crude protein diet, specifically delivering the actual MP they need.”

For many, there is an understandable worry that if the crude protein in the ration is lowered, then performance may suffer. “This is where rationing to the metabolisable protein content of the diet brings advantages, by ensuring there is sufficient “useable protein” (MPE) to meet the needs whilst ensuring the MP based on the degradable nitrogen in the mix (MPN) is not excessive. In the vast majority of dairy rations, this MPN is in excess, and we can, in most cases, reduce it, and so reduce the overall crude protein – provided we keep the MPE level where it needs to be.

Without this understanding, when the CP is reduced, the MPE would also be reduced, resulting in worse performance. Can we keep the same horsepower in the tractor to do the job but lower the engine capacity?

Feedstuffs and ingredients will vary in how they supply these fractions, which is why it is essential to look closely at the ingredients in the diet or in compounds. We formulate to metabolisable energy, so why not to metabolisable protein? Two compounds could have similar MPN content (and so, crude protein levels), but substantially different MPE levels which will affect how well they support milk production.

“Protein prices are going to remain high and volatile for the foreseeable future due to global factors. Focusing on rations based on MP and reducing total dietary protein will be a way to reduce the amount of protein needed, improving efficiency and saving money. At the same time we can reduce nitrogen waste, helping cut the environmental cost of milk production. Add to this the continued move away from soya and it will be possible for dairy farms to improve economic and environmental sustainability,” David Wilde predicts.