# Ask The Experts

Bruce Woodacre,
Knowledge Management, UK

**Q A mould count is often not a good indicator of the presence of mycotoxins? Can you explain why this is?**

A I think that mould counts are quite a good indicator but not all moulds produce toxins at all stages in their life cycle and toxins will still be present after the moulds that caused them have died. Moulds are also useful indicators because they can be seen by the naked eye, whereas mycotoxins cannot.

**Q In ruminants, mycotoxins are usually blamed for problems on the farm that cannot be explained. What is your opinion about this?**

A Yes, mycotoxins are in danger of becoming the new 'winter scour'. We have a dilemma here, on the one hand, mycotoxicosis (especially in its 'sub-clinical' or sub-acute form) is far more widespread in ruminants than is commonly supposed and, on the other hand, not all poor performance issues are down to mycotoxins! The problem is that it is rare to see 'classical' symptoms that can be attributed to one mycotoxin – fortunately, acute cases are relatively rare.

You commonly get a mixture of non-specific symptoms caused by low levels of multiple toxins and these are difficult to separate from other factors on the farm. If you use Mycosorb as a diagnostic tool, you will find out if you really have an issue very quickly and it is usually cheaper to do this than go through a time consuming analytical process.

Sylvie Andrieu, European Ruminant Technical Manager, Alltech Europe

**Q Historically, lactating cows producing 35 litres of milk have been fed diets of around 17% crude protein. However, recent research suggests that you can decrease this to as low as 15%. Have you ever tried applying this concept and, if so, what ration changes should be implemented?**

A From experience, decreasing dietary protein from 17 to 15% does not necessarily lead to lower yield – it is all about choosing the right feedstuffs, calculating the ration adequately and focusing on nitrogen efficiency.

However, you have to start with a good foundation – no feedstuff or ingredient can replace a good quality forage and good management. Once this is ensured, the nutritionist's attention has to turn to optimal feeding of the rumen bacteria so that maximum microbial yield is achieved.

One criterion to follow is the soluble crude protein to rumen degradable protein ratio as this really ensures maximal rumen microbial growth and activity. The danger of a ration below 0.52 is a lack of non-protein nitrogen in the rumen during the day, but this can easily be overcome by the inclusion of Optigen.

The solution is to feed the rumen first then complete the intestinal protein supply with a high quality protein source.

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Dr Judith Capper, Adjunct Professor, Department of Animal Sciences, Washington State University, USA

**Q What do you consider to be the dairy industry's greatest improvement in resource use to-date?**

A On a global basis, the dairy industry has made great strides in improving productivity and this has had positive economic and environmental effects on dairy sustainability. For example, the average annual milk yield of US dairy cows increased four-fold between 1944 and 2007, therefore a 59% increase in milk production was achieved in 2007, from a national herd containing 64% fewer lactating cows, than in 1944. This improvement in productivity allowed milk to be produced in 2007 using 21% of the animals, 23% of the feed, 35% of the water and 10% of the land required to produce 1kg of milk in 1944. At present, the focus for consumers, retailers and policy-makers is on reducing greenhouse gas emissions and therefore the carbon footprint of the dairy industry, however, it seems certain that water use will be the major environmental issue in future. A number of regions already have insufficient water to support both food production and urban requirements and this competition will only intensify as the global population grows – improving productivity and therefore reducing resource use per unit of dairy product will thus be increasingly important in the future.

**Q What are the opportunities for further environmental mitigation in the future?**

A Regardless of the production system, all dairy operations have the potential to improve productivity. The record producing cow in North America yielded 216,893kg in her lifetime, thus with the average cow producing around 10,000kg of milk per lactation, it is clear that considerable progress can still be made before cows reach their genetic plateau for milk production. The challenge is to match the system to the available resources so as to make the most efficient use of water, land and energy – there is no one-size-fits-all solution.

**Q There is a lot of confusion surrounding the best way to measure environmental impact of the dairy industry. Which way do you think best reflects the real impact?**

A The dairy industry exists to produce milk, cheese, butter and other dairy products, in addition to by-and co-products such as beef and leather – it does not exists to produce cows, heifers or other animals. The environmental impact is best and most accurately served and compared between systems by expressing on a 'per unit of dairy' basis, for example per litre, kg or tonne of product. Although it is tempting to express per head of cattle, this leads to considerable confusion – nobody would suggest that a 400kg Jersey cow would eat as much or emit as much greenhouse gas as a 680kg Holstein cow, and nor would they produce the same amount of milk, yet they would be counted as the same animal on a 'per head' accounting system. The question then becomes whether the 'per unit' metric is sufficient, or whether account should be taken of the nutrient content of differing products so that, for example, fluid milk could be compared to cheese or to soy-based beverages. It seems likely that an environmental impact per nutrient supply unit may be used in future.

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# Ask The Experts

Walter Schmitz – Dairy Consultant, HCS Herdenmanagement GmbH, Aurachsmühle 1, 97461 Hofheim, Germany

**Q What do you consider the goals should be for feeding protein to the dairy cow?**

A As we are dealing with ruminants, we have to be aware that the nutrients presented to the animal, after ruminal fermentation are very different from those entering the rumen as feed. Therefore, absorbed amino acids in the small intestine, not crude protein fed, are the required nutrients. It is assumed that there are different ideal patterns of absorbed amino acids for performance, maintenance, growth and lactation. The main protein source for the cow is the microbial protein. As rumen microbes mainly use ammonia for protein synthesis, microbial protein is the cheapest way of supplying protein to the cow.

In order to maximise microbial protein production we have to optimise ruminal efficiency by feeding adequate amounts of RDP (rumen degradable protein) and balancing the carbohydrate sources available to the rumen microbes. In a second step we want to add enough RUP (rumen undegradable protein) to optimise the profile of absorbed amino acids for the required performance.

From the aspect of high protein feed costs we want to minimise the dietary crude protein necessary to achieve the above mentioned goals. In this respect, supplementation of limiting amino acids in rumen protected form or usage of RUP, with specific amino acid composition, can become economically feasible.

**Q What are the important practical aspects of protein feeding?**

A Even though it may seem basic, increasing forage quality may be the single measure with the highest impact on protein feed cost, especially when you are feeding larger amounts of grass silage. With higher quality you can not only feed larger proportions of forages, but you will also supply more energy from fibre and soluble NDF to the rumen microbes, thereby increasing microbial protein production. Then, you want to balance your ration for RDP and metabolisable protein (MP) or maybe even amino acid requirement.

The next step is to make sure that you are actually feeding what you have calculated. You need regular feed analyses for your forages and you have to check the forage dry matter on a routine basis. Be aware that forage dry matter content is highly variable and you have to adjust the fresh matter fed, accordingly. Your goal must be to ensure consistent feeding. So set up control points, from dry matter analysis and checking the mixer wagon protocol, as far as scrutinising the mixing quality using the Penn state shaker box or TMR analyses.

As the cow is the crucial point you will need to look out for sorting and take the necessary action to prevent this as far as possible. In the end the cow tells you the truth. So you can use dry matter intake, manure consistency, milk yield, protein and fat content, MUN and herd health to evaluate the success of your feed management as a whole.

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