

Using milk urea testing as a management tool

The use of bulk milk urea samples will be of limited value to give an insight into herd nutrition. Evidence on the effectiveness of milk urea concentration as an aid to identify fertility problems is also conflicting and there is some debate about identifying threshold levels for milk urea, that is, concentrations above which problems may occur.

How to use milk urea test results

Milk urea testing may prove more effective in situations where cows are being individually sampled or where bulk tank samples are taken from herds operating a tight calving pattern and fed a uniform diet. In these situations milk urea testing may be used in conjunction with other records to identify possible imbalances in herd nutrition and fine tune ration formulation.

Low milk urea and low milk yields

In this situation it is likely that a positive milk yield response will be obtained from feeding extra protein. In situations where milk urea levels are high and cows are losing condition in early

lactation, it would be advisable to check the overall crude protein content of the ration. If crude protein levels are considered to be adequate, then correct the energy deficit by feeding additional energy sources such as cereals or sugar beet pulp.

High milk urea - cows holding condition

Where milk urea concentration is high and cows are not losing condition, the general interpretation is that while high urea levels may not be causing any problems, the protein in the diet is being used inefficiently by the cow. Reductions in the amount of degradable protein and/or crude protein and increases in the amount of fermentable energy being fed may be recommended as a result.

Discuss the implications of milk urea testing with your local Greenmount Dairying Development Adviser before making any changes to dairy cow diets. Farmers interested in using milk urea nitrogen as a nutritional management tool should consider plotting urea levels on a chart through the year to establish a benchmark for their herd. This in turn can be used in future years to show possible deviations from the norm.

Milk Urea Nitrogen Testing – Practical Implications

What is milk urea?

Urea is a nitrogenous compound found in the blood of dairy cows, which diffuses freely into the milk making up around 2.5% of the nitrogen found in milk. Urea is produced by one of two processes:

- Breakdown of protein and non protein nitrogen (NPN) in the rumen into ammonia which is converted to urea.
- Breakdown of excess amino acids in the liver.

Excessive production of urea is associated with inefficient use of protein in dairy cow diets and has been implicated with reductions in dairy herd fertility in some situations. Most of the urea produced is removed via urine but some passes into the milk. A test now exists that allows the urea content of milk to be measured, which gives an indication of levels of urea within the bloodstream. Samples may be collected on an individual cow basis or as a single sample taken from the bulk tank.

Typical concentrations of milk urea

Milk urea concentrations are usually expressed as either a percentage or as mg/dl (dl is an abbreviation for decilitre, where 10dl is equivalent to one litre). Values recorded under local conditions and their interpretation are given in Table 1.

Low values (25mg/dl) indicate a low overall protein level in the diet. High values (greater than 35mg/dl) would indicate surplus protein in the diet and possible health / feed issues for the farmer to consider.

Factors affecting milk urea content

Changes in milk urea concentration are generally associated with changes in the diet of the dairy cow. For example, low urea contents are associated with low amounts of dietary protein and/or degradable protein, for example, low D-value mature grass or silage or diets containing large quantities of maize silage without appropriate protein supplementation. High urea concentrations are associated with diets containing large amounts of protein and/or degradable protein combined with low supplies of fermentable energy, spring grass being an example.

Other factors however will also affect concentrations of milk urea. These include:

- Breed
- Body weight of cow
- Change in body condition
- Parity
- Stage of lactation
- Season
- Health status
- Water intake

Table 1: Range in milk urea concentrations and their interpretation

Percentage	mg/dl	Interpretation
0.025	25	Low
0.035	35	Average
0.045	45	High
0.055	55	Very high

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ISBN 1 85527 590 2

April 2003



DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT