

Analyse forages for mineral levels to avoid over or under supply

# Avoid 'mineral' assumptions

Do you know the mineral and trace element levels contained in your silages? It's invaluable information when formulating dairy rations, according to two leading UK nutritionists, and here they explain why forages should be analysed.

text **Rachael Porter**

Forages form the bulk of dairy rations and, therefore, have a significant impact on daily mineral intakes. But few producers take the mineral levels in silages into account when formulating rations and considering supplementation, according to Frank Wright Trow Nutrition International's Amanda Sutton. "Forages typically make up around 50% of the total dry matter of dairy cow rations and so are expected to contribute a significant proportion of the total mineral requirements," Ms Sutton explains. "We know that forage mineral contents can vary considerably yet most diets assume standard figures and this could lead to either over or under supply of minerals and trace elements." And since milk production, herd health and fertility can be greatly influenced by correct mineral, trace element and vitamin supply, it should be regarded as an integral part of nutrition, and of similar importance to energy and protein supply, according to KW Alternative Feeds' nutritionist Mark Scott.

### Cow performance

Micronutrients affect many areas associated with cow performance, including feed efficiency, lameness, clinical mastitis, high somatic cell counts, retained placenta, fertility, milk fever and general immunity, all of which can positively or negatively

impact on overall herd health and longevity of the dairy cow (see table 1). "So ideally producers should look to feed a compatible vitamin and mineral supplement, which complements the forage, feeds contained in the ration and the herd's production expectations," he adds. Quoting data from several thousand silage samples analysed during the past three years, Amanda Sutton says that in many cases mineral levels in forages are declining, and this will require possible increased supplementation levels. "And, at the same time, some mineral levels are increasing, which may allow cost savings to be made without risking performance and health. "For example, our analysis shows that while copper levels in grass silages are declining, selenium levels actually increased on average. Zinc levels in grass, wholecrop and maize silages are declining." Ms Sutton advises producers to have their forages tested for mineral composition as this is the only way to ensure accurate mineral levels in the total diet. "As levels vary from year to year – reflecting soil type, growing conditions and other factors – it really makes sense to have a mineral assay carried out when you get your silage analysed. "Relying on average figures could potentially leave you open to the risk of deficiencies, which will affect milk yields, health and fertility. "Instead, with correct information, a

cost effective supplement can be added." "Regional variations are very localised and producers generally know if they are in an area of high copper or low iodine, for example," adds Mr Scott. "But for a true profile then all forages in the ration should be sampled and analysed for mineral profile. The results can then be sent to a mineral house, such as Frank Wright Nutrition or SCA, along with the ration being fed, including a specific breakdown of blends plus any particular problems observed in the herd, such as poor fertility or excessive SCC. "These companies can then formulate a balanced mineral for the herd, if that level of detail is required. That's usually the case in high performance herds or in herds where problems are occurring. Feeding any cereal silage, particularly maize silage, will require increased supplementation, particularly vitamin E, copper, selenium calcium and phosphorus, according to Mr Scott.

### Helping hand

Even grass silage-based feeding systems need a helping hand, despite being abundant in most macro-We focus on water quality and forage minerals in our feeding special minerals, including calcium, phosphorus, magnesium and sodium. "This forage tends to be significantly higher than cereal silages in potassium, chloride and

*Forage facts: many producers analyse forage for energy and protein content. But what about minerals and trace elements?*

sulphur, but will still need significant supplementation. "And producers should remember that high levels of potassium in grass-based systems can contribute to increased milk fever and other metabolic diseases postpartum due to disruption of the cation:anion balance." Grazing is similar to grass silage-based systems with additional issues in spring when extra magnesium should be fed as part of the mineral or in addition to the standard mineral. This can be either as calcined magnesite, at a typical rate of 50g/cow/day to combat hypomagnesaemia (grass staggers), or magnesium chloride, which is often added to the water.

### Check labels

Cereal forages tend to be lower in all macro-minerals than green forages and most significant are calcium, potassium and sodium. "This is why these forages are good for dry cow rations, but require additional supplementation when fed to lactating animals," says Mr Scott, adding that grain is a particularly poor source of calcium so high feed rates may even require additional limestone flour in the ration supplementary to mineral use. Feeding rock salt is widely advised when any cereal silage is being fed due to its lower levels of sodium and chloride. Major minerals are often lacking in

deficiencies	major elements				trace elements				vitamins					
	calcium	phosphorus	magnesium	sodium	iron	cobalt	manganese	copper	zinc	iodine	selenium	vitamin A	vitamin D3	vitamin E
infertility		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓
abortion						✓				✓	✓			✓
mastitis								✓		✓				✓
somatic cell counts								✓		✓				✓
milk fever	✓	✓	✓											✓
hypomagnesaemia			✓									✓		
scouring								✓						✓
depressed appetite		✓		✓										
disease immunity											✓			✓
retained placenta										✓	✓			✓
poor growth/production	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
bone formation	✓	✓					✓	✓	✓			✓	✓	

Table 1: The impact of mineral deficiencies on cow health and fertility

whole crop diets and the first likely problem is with calcium and to a lesser extent sodium and magnesium. "It is unlikely that optimum levels can be reached without feeding a total of minerals in the range of between 200g and 400g per cow per day – subject to the level of supplemented compounds being fed and the production level," says Mr Scott. Trace element levels tend to be low in wholecrop, but on the plus side trace element antagonists are also low. A robust supplement package is required with plenty of copper, selenium, zinc

and iodine. "The reduction in grass forage in the diet necessitates an increase in the level of supplementary Vitamin E," he adds. Looking at the mineral content of other feedstuffs, sugarbeet feed, cane molasses and rapemeal can be good sources of calcium, while many yeasts can contribute calcium to the ration if the carrier is limestone flour. "But check the labels as the carrier can be limestone flour or wheatfeed. "This is particularly important if feeding to dry cows as well as lactating cows," he adds. |

