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Warning over copper levels in feed

Dairy cattle could be at risk by feeding too much copper, a recent investigation has found. **Rhian Price** reports

Farmers are being urged to audit the amount of copper being fed to dairy cattle after on-farm investigations found stock is being endangered by feed products that exceed industry copper level guidelines.

Youngstock is increasingly identified as being at high risk from over-supplementation, even when fed at manufacturers recommended rates, warn experts.

Six years after the Food Standard's Agency (FSA) issued new guidelines lowering recommended use to 20mg/kg DM, independent nutritionist Hefin Richards of Profeed Nutrition Consultancy and vet Dan Stevenson of Lambert, Leonard and May, say recommended limits are still being widely ignored.

And it is not uncommon for copper to exceed legal maximum permitted levels of 40mg/kg DM in some cases either, they add.

The duo carried out their own on-farm investigations following a spate of calf mortalities last year and found many off-the-shelf dairy and dry cow minerals and supplements led to total diet copper levels significantly higher than the industry guideline.

"This isn't an isolated thing. Farmers are not doing anything off label and without realising, they are feeding copper levels way in excess of guidelines," says Mr Richards.

He says one farm was feeding close to the legal maximum before taking into account that cows had also received copper boluses and mineralised parlour concentrate.

For example, a mineral containing 3,000mg/kg fed at 150g/day would equate to 450mg/day (3,000x0.15). If a dry cow is eating 12kg DM, this provides 37.5mg/kg (450/12) of added copper. Background levels in feeds would take this well above the legal maximum and more than double the recommended maxi-



TIM SCRIVENER

Calves are at particular risk from copper toxicity, with some specialist compound feeds containing high copper levels

mum, explains Mr Richards.

"One specialist dry cow compound supplied above the legal maximum level of copper on its own, when fed as directed to pre-calving cows," he added.

YOUNGSTOCK AT HIGH RISK

Investigations found youngstock was commonly fed dangerous levels of copper, with specialist compound feeds routinely supplying 40mg of copper/kg.

If a calf is eating 5.5kg/day (based on the calf eating 2.75% of its body weight at 200kg) this equates to 160mg/day in total – the equivalent of 29mg/kg DM (160/5.5) and there

will be background levels in forage, explains Mr Richards.

Furthermore, farmers reported that it was a challenge to source standard calf-rearer products with sufficiently low levels of copper to meet their requirements when rations were reformulated.

Mr Richards warns the issue is compounded when calves are fed straw because it contains low levels of antagonists – chemical elements known to reduce copper availability.

WHY DO MANY FARMERS FEED TOO MUCH COPPER?

Many farmers oversupply copper because they believe their farms

have high levels of antagonists such as iron, molybdenum and sulphur.

However, maize, straw and wholecrop contain lower levels of antagonists than grass silage and these can vary yearly and between silage cuts, says Mr Richards.

Mr Stevenson says the old adage "some is good, so more must be better" does not apply to copper.

He warns farmers must stop basing their copper requirements on historical levels and should test forages regularly.

"With high levels of supplementation, copper toxicity is a far greater risk than copper deficiency."

HOW TO PREVENT TOXICITY

Mr Richards and Mr Stevenson are urging farmers to carry out a complete audit of the amount of copper being fed on farm in conjunction with feed advisers and vets.

"Know your total copper supply from all sources – mineral buckets, drenches, boluses and feeds – and calculate daily intakes," advises Mr Stevenson.

In addition, liver biopsies from live animals are the best indication of copper stores and farmers should work with their vets to get biopsy results prior to planning rations.

"Sample animals that have been exposed to the highest levels of copper, such as high yielders in mid- to late lactation, and use information from deadstock."

HOW ANTAGONISTS WORK

* Molybdenum and sulphur interfere with copper absorption and bioavailability by combining to form thiomolybdates in the rumen and intestine.

Thiomolybdates have a strong attraction to copper and bind to it, creating an insoluble complex that can't be absorbed and is lost through faeces.

If there is insufficient copper to "detoxify" thiomolybdates formed, particularly in the rumen, they can be absorbed into the animal via the blood and bind to biological copper, reducing its activity and causing clinical signs

usually associated with copper deficiency.

The temptation to provide more copper to offset the apparent "lock-up" may lead to excess, especially if the copper does not bind to thiomolybdates in the rumen.

This is when clinical signs and accumulation (copper loading) can occur at the same time.

Iron, sulphur and copper also form an insoluble complex in the rumen, reducing the copper available to "detoxify" thiomolybdates.

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