

Alarming statistics, which suggest that more than 50% of cull cows in the UK are carrying excessive levels of copper in their livers, have triggered an urgent warning about over supplementation in dairy cows and youngstock. Jeremy Hunt reports.

# Copper is being overfed and can lead to fatalities

Concerns over the level of copper in the national herd led Defra to undertake an investigation based on liver samples taken from 510 cull cattle at a single abattoir over a three-day period.

The findings showed dairy breeds had higher liver copper concentrations than beef breeds and 38.3% of Holstein-Friesian and 40% of 'other dairy breeds' were carrying levels of copper which were above the Animal Health and Veterinary

Laboratories Agency (AHVLA) reference range.

However, only 16.9% of beef cattle exceeded this level.

The investigation concluded that more than 50% of the liver samples tested had greater than normal concentrations of copper.

One farm vet practice has been working closely with farmers and their nutritionists to get a grip on this situation.

Farm vet Sarah Gibbs of Lambert, Leonard and May, tells us the trial results stated 'a significant proportion' of the UK herd



Investigations showed 38.3% of Holstein-Friesians were carrying levels of copper which were above the AHVLA reference range.

is at risk of chronic copper toxicity.

She says: "There is an historical concern among many dairy farmers about avoiding copper deficiency. Concerns over 'teart' pastures and the temptation to put fertility issues down to mineral deficiencies have led to widespread use of supplementary copper.

"However, many of these concerns can be over emphasised. For example, it is not very common for molybdenum [which binds up copper and can lead to deficiencies and other problems] to be at such levels to cause significant

issues. Therefore, it can become easy to unknowingly over-supplement copper, because so many inputs are carrying high levels of the mineral."

#### Metabolic

Copper plays an essential rôle in many metabolic processes and is often linked to fertility, but like many vets Ms Gibbs says feeding too much copper to dairy cattle is putting them at risk.

"Excess dietary copper is stored in the liver to be released in times of high demand. The liver can only hold a certain amount of copper, after which it



**“It can become easy to unknowingly over-supplement copper, because so many inputs are carrying high levels of the mineral Sarah Gibbs**

can suddenly ‘spill over’ into the blood stream, usually leading to death. However, in herds with copper toxicity problems there may be no obvious signs of its presence, despite liver damage building up. The first warning sign could be a sudden death.

"Sadly for every sudden death, many more cows will be suffering from liver pathology causing unseen losses.

#### Placenta

"There is also some evidence to show over-supplementation of copper in pregnant cows can be passed to the calf via the placenta. This means calves are born with an elevated liver copper level. These calves are clearly at high risk if they are then fed a diet that is high in copper," says Ms Gibbs.

Furthermore, youngstock fed dairy concentrates

rather than rearer concentrates, which are much lower in copper, are at serious risk.

"The high rates of copper inclusion for dairy cows can more rapidly become toxic for youngstock," she says.

#### Regularly

Vet Rob Howe, also from Lambert, Leonard & May, says: "This issue is not a new phenomenon," pointing to work done by AHVLA highlighting the fact no diagnoses of copper deficiency were made by them in dairy cattle between 2002-2011 in England and Wales, whereas copper toxicity diagnoses were made regularly, with most of these being in dairy cows.

"There are many sources of dietary copper and there are also people wanting to sell 'quick fixes' containing it. So it can be easy to over do it when considering cumulatively the copper

tively the copper content of forages, concentrates, straights, water, TMR minerals, copper based foot-baths, mineral licks and boluses," he says.

#### Misconception

"There can be a misconception a higher copper content means a higher quality feed. It is definitely true copper is a costly component of the mineral mix, and so a reduction may well not only give you healthier cows but also a healthier bank balance."

So where does all this leave us with working out exactly how much copper

we should be supplementing our herds with?

Mr Howe urges dairy farmers to discuss copper and mineral supplementation with their vet and nutritional adviser and to be cautious of tests such as bulk milk copper especially.

He says blood samples are good for diagnosing deficiency, but of less value in the more usual copper toxicity situations. Even silage analysis can be easily misleading, he adds, since it is usually just one component of the diet, but also because the 'bar graphics' actually indicate the levels of that year's

range of silages analysed and do not necessarily indicate dangerously high or low levels.

#### Liver samples

"In dairy herds, where toxicity rather than deficiency is far more likely, the best option is usually to obtain liver samples from cull cows sent to the abattoir, just as they did in this study," he says.

Mr Howe says that because of all the various ways in which copper can be supplemented, every-thing going into the cows' ration should be factored in to calculate copper intakes, and that

includes water analysis.

"The aim must be to avoid deficiency without causing toxicity. A joined up approach between the farm, the vet and the nutritionist is very useful in my experience.

"We are now looking at about 66% of UK dairy herds over-supplying copper according to research undertaken by DairyCo in 2012.

"In 2014, a study involving nine farms found 78% to be over-supplementing copper, with one farm actually feeding above the legal limit (40mg/kg DM)," he says.