

# SPONTANEOUS FRACTURES IN HEIFERS

During the early part of spring 2011 we noticed that we were experiencing more calls than what we would consider “normal” for broken legs. The odd case on individual farms perplexed us, as no reason could be found, and most often the animal involved was a heifer. Then came the case of 4 broken legs in heifers (out of 34) on the one farm over a 4 week period. This was an incredibly unusual event, and after ruling out “normal” causes a bone development problem due to mineral deficiencies was suspected. Calcium and phosphate are both critical for bone growth and strength and are often lacking in a grass only diet. Another possibility that we considered was copper deficiency, as this can be associated with spontaneous fractures in cattle. Blood calcium, phosphate and copper tests showed normal levels, but a liver sample from one of the animals when it was euthanised revealed a serious deficiency. Treatment with copper has resulted in no more fractures on that property. After discussing this problem with other vets it would appear that we were not the only clinic to have had outbreaks of multiple leg fractures in heifers that responded to copper therapy. We heard of another Waikato farm that had 14 out of approximately 180 heifers.

## **Copper.**

Copper is an essential trace element that plays a vital role in the physiology of animals: for foetal growth and early post-natal development, for haemoglobin synthesis, connective tissue especially in the cardiovascular system and in bones, for proper nerve function and bone development, and inflammatory processes. Copper deficiency leads to depression of growth, anaemia, bowing of the legs, spontaneous fractures, decreased resistance to infectious disease, diarrhoea and generalised ill-health, cardiac and vascular disorders, de-pigmentation of the coat as well as depressed reproductive performance. *The picture illustrates how deficiencies during the growth period can affect the difference in bone thickness of animals.*

Liver copper levels are the best indicator of copper status of dairy cattle. Regular testing is critical as illustrated by a case during Winter where we tested liver mineral levels in cows from a herd brought by a sharemilker. The copper levels were so low that in some cases they were undetectable, yet physically the cows had good coats and were in condition score 4.5-5.5. Cows with levels that low run the risk of spontaneous death, let alone broken legs!

## **Requirements vs Recommendations**

It is difficult to find anyone who can give you the “correct dose” of copper to give dairy cattle. This is mainly because the various studies on trace element requirements show variable results due to the numerous factors impacting on the outcome of experiments e.g. criteria used to assess results, composition of the base diets and animal breed. Therefore, for practical reasons various national scientific bodies express recommendations rather than requirements.

Recommendations include a safety margin to ensure an appropriate coverage of the animal requirements, even in the case of high-performing animals. Recommendations are expressed as mg per kg feed or as mg per kg dietary dry matter (DM).

It is well known that Molybdenum, Sulphur & Iron will affect the absorption of copper by ruminants. Diets that are high in one or more of these elements can lead to what has been termed copper responsive disorders in animals. These animals may have “normal” blood copper levels but they could be suffering from copper deficiencies at certain sites within their bodies. Doses of Zinc used to prevent facial eczema also have been shown to inhibit the uptake of copper.