

Do you have a horse with poor hoof quality? Do you have an equine prone to horse hoof abscesses? Find out about the way that nutrition and the balance of minerals in your horse's diet can affect horse hooves.



## Horse Hoof Abscesses

There is a direct relationship between the imbalance of minerals in some forages and the occurrence of horse hoof abscesses and or poor hoof quality. The usual profile of our UK and European grass and hay fed to horses is one where a picture of high iron and high manganese blocks the uptake of low copper and low zinc. Where molybdenum is also high then copper absorption is further compromised.

Find out about the statistics of minerals in horse hay and grass

### How do minerals affect horses hooves and horse hoof abscesses?

A complicated relationship exists between all minerals and the way they compete for absorption sites in the horse's digestive system. A very simple way of looking at this is to use the analogy of a lottery machine where in the lottery machine you have both iron and copper balls competing to get down the shoot.

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Zinc is present in high concentrations in normal hoof tissue and is critical for a variety of functions. It is vital for the assembly of keratin and keratin is the major structural protein from which hooves are made. Zinc is also essential for a variety of enzymes that every metabolically active cell needs. It is involved in regulating the rate of cellular division, cellular activity and cellular maturation. Think lottery machine, think ratios of manganese to zinc which are regularly over 30:1 and it is not too difficult to see that zinc deficiency is showing in our horses' hooves in a number of ways.

You might see:

slow hoof growth

thin walls

weak connections (white line)

weak flaky horn

abscessing

thin and soft soles

Hoof abscesses in the horse hoof are not surprising because when the hoof horn is weak at a cellular level, micro breaks in the structure make the keratin far more vulnerable to attack by organisms, but there is more to it than just zinc. Copper too is vitally important for keratin health. Along with zinc it enables a function which prevents fats and oils from oxidising. Oxidative damage to the fats in the hoof structure breaks the protective seal on the hoof, causing over drying (weak flaky horn) and weakening of the 'glue' between the cells. Copper also enables important enzymatic functions required for anaerobic metabolism in rapidly dividing cells. Important sulphur cross bridges that hold keratin strands together are often compromised because these enzymatic functions are compromised due to copper insufficiency in the body.



Horse hoof abscesses can occur when mineral ratios are imbalanced in grass, hay or haylage.

The really surprising thing is that in cattle, deficiencies of copper and zinc have been linked strongly to:

- soft feet
- cracks
- sole haemorrhages
- abscesses
- thrush (“foot rot” in cattle and sheep!)
- laminitis

## Supplementing extra copper and zinc for horse hoof health

Supplementing extra copper and zinc reduces these problems and for years now the agricultural industry have been formulating bespoke mineral supplements for farmers based on balancing to the mineral profile of the forage their cattle are eating. The agricultural industry know that evaluation of trace mineral levels in the diet is critical for cattle with hoof problems, they also know that high iron and manganese interfere with trace mineral absorption. They feed a forage focused, ratio orientated mineral and vitamin supplement. They boost only the minerals their animals need to have healthy hooves.

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## What do the horse feed industry do?

So why, given the evidence from analysis of grass and hay, has the horse feed industry been routinely adding iron and manganese to all their mineral and vitamin horse feed supplements? Why do they favour using a broad spectrum approach? A scatter gun put a little bit of everything into a mix doesn't make sense when the average profile of UK and European grass and hay shows horses will be exposed to really high levels of some minerals in their diet. High levels of some minerals automatically block the uptake of others which are already low. Supplementing these excess minerals could cause even greater problems and effectively cancel out the pitiful levels of minerals such as copper and zinc added in those very same broad spectrum supplements.



## What should the horse owner do?

When you get an abscess in your horse's hoof or your horse has poor quality hoof horn, soft soles, flakey hoof horn and or cracks, look first to copper and zinc levels. Get the ratios with iron and manganese balanced. *Balance horse feed to the common grass and*

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*hay profile*. There are other things which may be insufficient such as B vitamins, or the essential amino acids, but one of the *major* missing links, in our opinion and experience, is correct ratios of the most commonly deficient minerals in grass and hay.

Understand vitamins in horse diets

Find out about protein in horse diets

Learn about feeding your horses using a forage focused approach

Find out about testing your grass and hay to check horse diet mineral levels

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