



A NEW GENERATION OF ORGANIC SELENIUM

NEW ZEALAND SOILS ARE LOW IN SELENIUM

Selenium is an essential trace element for ruminants and required for growth, fertility and the prevention of mastitis and calf scours. However, selenium deficiency is prevalent in soils around the country. This presents an issue every farm manager would benefit from understanding better. A new generation of organic selenium supplementation (called Excential Selenium 4000) will be introduced into New Zealand this year. It's an exciting development, providing a significant improvement to previous options for selenium supplementation on the farm. But first we need to understand the relevance and impact of selenium deficiency.

WHY IS SELENIUM IMPORTANT?

Specific enzymes (selenoproteins) require the incorporation of selenium to ensure their activity in the animal. These enzymes reduce the presence of oxide radicals (produced during normal metabolic activity and elevated during stressful periods) that cause cell damage and subsequent malfunction of tissues. Protection against these harmful by-products is especially important in high-energy demanding cells such as heart, muscle and mammary gland cells.

Unfortunately, there is often a selenium deficiency in animals due to limited uptake from the diet. These deficiencies can be pronounced in ruminants grazing on pastures grown on selenium-deficient soils, such as here in NZ. Resulting challenges may include suboptimal milk production and fertility, mastitis and premature, weak calves. In places with severe selenium deficiency calves have poor growth rates, difficulties standing, and sudden deaths can occur. To prevent this, it is important to provide additional selenium via the diet and assess regularly the selenium status of the herd by analysing blood and milk.

SELENIUM DEFICIENCY – A NUTRITIONAL SOLUTION

Selenium can be added to the diet in either inorganic or organic forms. The advantage of using organic selenium over inorganic sources (e.g. sodium selenite or selenate) is its

ability to be incorporated directly into animal proteins. This incorporated selenium (in the form of L-Selenomethionine) acts as a storage depot of selenium inside the animal. L-Selenomethionine is the only selenium compound that can be directly, without conversion, built into animal structural proteins (i.e. muscle and liver). This ensures optimal selenium supply, even during stressful periods (e.g. calving, lactation, heat) when selenium intake is required most by the animal.

L-Selenomethionine has traditionally been supplied to a cow's diet via addition of selenised yeast. However, the yeast approach is limited. Normally, around 63% of the total selenium in a selenised yeast is present as L-Selenomethionine but there is a huge variation between products and batches (it can be as low as 18%!). The remaining selenium absorbed by the yeast cells is present in forms that are no more active than much cheaper inorganic selenium.

The introduction of Excential Selenium 4000 into the market now provides a better option to optimally supply animals with L-Selenomethionine.

THE SUCCESS OF ORGANIC SELENIUM IN RUMINANTS

Stressful periods - through transition, birth, weaning - during a dairy cow's life are plentiful and they are always correlated with an increased oxidative stress. The period 3 weeks prior to calving and 3 weeks post calving presents a big challenge to cows as they transition from late gestation to early lactation. The increased metabolic activity and energy demand that marks this period is linked to a high increase in oxidative stress. To combat this stress the animal needs high amounts of selenium.

Literature shows that supplementation of organic selenium to Se-adequate cows during late gestation improves antioxidant function in early lactation. This leads to effective reduction in oxidative stress. Storable selenium (L-Selenomethionine) can have a big positive impact during stressful periods. Positive effects for organic selenium are also seen on the immunity (e.g. neutrophils). This will be beneficial in improving the mammary gland health and lowering the somatic cell count.

Birth to weaning presents a huge challenge for calves and stress reduction in this period is key. To enhance the selenium status of calves during the first weeks, selenium transfer from cows to their offspring via the milk is essential. Vandaele et al. 2014 investigated the effect of different sources of selenium supplementation on milk concentrations in dairy cattle. Sodium selenite, selenised yeast and a dust free preparation of L-Selenomethionine (Excential Selenium 4000) were included in the trial at 0.3 mg Se/kg dry matter intake (DMI). The dust free preparation of L-Selenomethionine increased the milk selenium level to the highest extent throughout the whole trial period.

LIFTED TO MAXIMUM POTENTIAL

Organic selenium has long-standing proven benefits over inorganic selenium, especially during stressful periods. Thanks to day-to-day engineering and innovation, organic selenium has been lifted to its maximum potential. Excential Selenium 4000 is the only organic product in the market providing all selenium in the most effective, bioavailable form of L-Selenomethionine. There is no variation in concentration in comparison with other organic selenium sources (e.g. selenised yeasts) and from a health and safety perspective it's supplied as a dust free preparation.

Excential Selenium 4000 (L-Selenomethionine) - produced by Orffa Additives BV, the Netherlands - is now available for inclusion in feed premixes in both the North and South

Islands. For more information contact Agvance Nutrition.

[Excential Selenium 4000](#)

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