

SELCOTE[®] **ULTRA** ***SELENIUM GRANULES***

A GUIDE TO STOCK SELENIUM SUPPLEMENTATION MANAGEMENT



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Selcote Ultra

Selenium Supplementation through Fertilizer application

Selenium is a vital trace element, and is required by all animals. While plants do not require selenium, the natural route for selenium intake by ruminant animals is from their green feed diet. However many soils in North America are deficient in selenium, and the resulting feed, especially in high yield crops, is likely to have inadequate selenium for healthy growth and production.



Selcote Ultra, a slow release granular form of selenium, is the natural solution to boost low plant selenium levels. Selcote Ultra is generally applied with Fertilizer and releases selenium throughout the plants growing cycle, boosting the selenium content at harvest or during grazing.

Why is Selenium important?

Selenium is an essential component of selenoproteins. Within mammalian systems there are thought to be up to 100 selenoproteins, although only about 30 of these have so far been characterised. These selenoproteins are vital for functions such as sperm mobility, conception and embryo development in cows, and for an efficient antibody response against diseases such as mastitis. Selenium (as an incorporated selenoprotein) along with Vitamin E are important antioxidants and help prevent damage on biomembranes caused by free radicals. Selenoproteins are important components in the animal's ability to handle stress, such as cold weather and high production demands.

Problems arise when the dietary intake of cows contains less than 50 ppb (parts per billion) of selenium, especially when the lack of fresh green feed reduces the intake of vitamin E. Cows with a high production demand may require higher selenium levels. Without adequate selenium both acute and sub clinical deficiency symptoms occur:



White Muscle Disease

This disease, also known as muscular dystrophy, can affect calves and lambs, causing them to be born dead or to die suddenly within a few days of birth. A delayed form of this disease can occur in animals 3-6 weeks of age, with affected animals having a stiff gate or arched back and being reluctant to move.

Infertility

Selenium deficiency at mating can result in a high proportion of barren cows as a result of embryonic loss 3-4 weeks after conception. Selenium is also required for sperm production and mobility. Dairy cows may respond to selenium with a better return to oestrus, reduced calving problems, and less retained placentas.

Ill Thrift

Selenium deficient animals will fail to maintain optimum growth rates. Milk production gains have been reported in dairy herds with a mean herd blood selenium concentration of less than 100 ppb.

Increased Disease Susceptibility

Selenium is required for an efficient antibody response helping to reduce sub clinical mastitis, and other disease pressures. Selenium is required by enzymes to break down damaging peroxidases and other free radicals.

What Selenium levels are adequate?

Selenium deficiencies occur when the forages fed to cows have a low selenium level, principally due to low soil selenium levels. The available soil selenium can be further diluted by high dry matter production from those soils. Cattle grazing or being fed this feed will be deficient in selenium. Inorganic supplementation of rations will help, but it may not be the total answer. Surveys have shown many farm animals in North America are still deficient despite inorganic selenium supplementation at up to 300 parts per billion (ppb).

The dietary levels for selenium in green feed / silage are as follows (ppb):

Deficient	Adequate	Optimal
<50	50 - 100	100 - 500

Factors affecting Selenium Uptake:

- Soluble forms of selenium will leach out of the root zone under heavy rainfall conditions.
- Acid soils reduce plant available selenates to unavailable forms of selenium.
- Some elements such as Sulphur compete for the plant uptake of Se.
- The high dry matter crops such as Corn require higher soil Se levels to maintain plant Se.
- Grasses are generally more efficient at taking up selenium than legumes.

The levels for selenium in whole blood of dairy cattle are:

Deficient	Marginal	Adequate	Toxic
<50	50 - 100	100 - 500	2000+(ppb)

Selcote Ultra – The natural choice to boost selenium levels.

Selcote Ultra is a 1% w/w Selenium granule, applied to pasture, alfalfa, corn or forages, once a season. Selcote Ultra is best applied when mixed directly with fertilizer. Selcote Ultra boosts the selenium content of pasture and forages so animals ingest organically complexed selenium (mostly as selenomethionine) with every mouthful.

Effectiveness

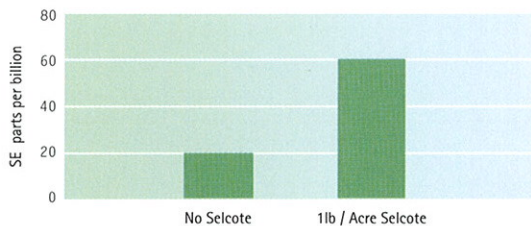
The selenium in Selcote Ultra (via the pasture/forages/silage) is absorbed by the animal as selenomethionine, which is absorbed and utilized up to twice as effectively as inorganic selenium supplementation in rations.

Selenium Content of Crops

Selcote Ultra application will boost the selenium content of crops. The level of the increase will vary depending on application rate, plant species (and therefore yield) and background levels of selenium in the soil.

In a number of countries where animals graze only pasture species, the levels of selenium in the animal can be wholly attributed to the Se content in the plants. Where animals are fed a mixture of rations, the resulting Se blood levels are a combination of the Se content of the various components of the diet.

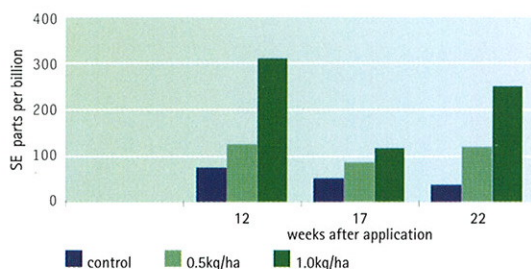
Selenium levels in Corn Silage – New York 1999



Season Long Supplementation

Selcote Ultra boosts selenium levels for the full growing season. The formulation contains both fast and slow release forms of selenium to provide a rapid lift in Selenium levels, which remain elevated throughout the growing season. Selcote Ultra should be applied to grasses and Alfalfa in early spring to ensure elevated selenium levels for the full growing season.

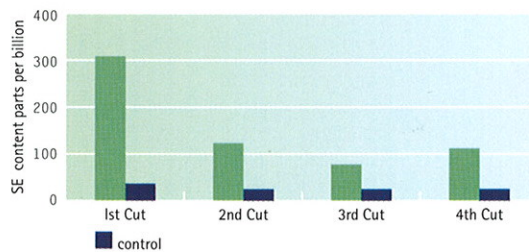
Selcote Ultra Application to Ryegrass Canada – PEI – Upton 1991/92



Selcote Ultra Application

Selcote Ultra should be applied only when mixed with a dry Fertilizer Blend. Selcote Ultra cannot be applied with liquids as the granular form provides the slow release properties in the field. With Alfalfa and grasses Selcote Ultra should be applied in a broadcast application, preferably in early spring. With corn and maize silage Selcote Ultra can be banded in the drill row at sowing, or incorporated in a side dressing within 4 weeks of germination.

Selenium levels in Alfalfa – Canada 1990 1kg/hectare



Establishing the need for selenium

- Measure selenium levels from forages on the farm – are they adequate?
- Have the herd tested by the vet to determine blood Se levels.

Only a sample number of animals need be tested – in the case of a dairy herd: 2 cows both in early and late lactation, 2 dry and 2 heifers would be sufficient (i.e. 8 in total).

- Supplement pasture/forages with Selcote Ultra to lift dietary selenium intake.
- Repeat the blood test every 6 months to monitor the Se levels, using the same animals.

Planning a supplementation strategy

- Selenium can be supplied in a number of ways and so it is important to avoid over supplementation, once Selcote Ultra use has started regular monitoring of stock for Se levels as well as other micronutrients should become a part of your farm management practices.
- Selcote Ultra should be applied annually to all fodder crops at recommended rates.

Application rates:

Corn/Maize for Silage:

1.0 – 1.5 lb/acre (1.0 – 1.5 kg/ha) per annum.

Grasses and Alfalfa:

0.8 – 1.5 lb/acre (0.5 – 1.0 kg/ha) per annum.



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