

# Why should you use Selcote Ultra?

## Convenience and Versatility:

One phone call can ensure Selcote Ultra is supplied with your fertiliser requirements. Talk to your agricultural merchant or fertiliser company when ordering your fertiliser. No stock handling, no labour requirement, and all your animals are supplemented - naturally. Alternatively Selcote Ultra can be easily applied direct with a small spreader to suit your individual requirements.

## Effective & Proven:

Selcote Ultra has for 17 years provided sustained pasture selenium levels to NZ's top farmers. Regular use means all your grazing stock have continued access to a natural selenium source - your pasture. No injection, no dosing or level worries and when you sell the stock the selenium investment stays on the farm.

## Value:

Compare the cost of using Selcote Ultra to using other methods of selenium treatment. When you take into account application rates and ease of application, stocking rates, length of supplementation and no stock handling required, Selcote Ultra is in a class of it's own.

## Safety:

Selenium can be toxic if stock are given too much. Selcote Ultra has a 10-20 fold application error margin. Once Selcote Ultra is applied other supplementation methods are not necessary and should not be used. Selenium in drenches and vaccines is unlikely to be detrimental if used in addition to Selcote Ultra.

## Beware of Imitations:

Selcote Ultra is the only slow release selenium granule available. Other selenium granules can give excessive initial levels and have a short pasture life. When you order insist on Selcote Ultra (not selenium) for both 12 month and 24 month supplementation - see Application Rate advice.

**Talk to your agricultural merchant or fertiliser company when ordering your fertiliser**

Marketed by Nufarm, 6 Manu Street, Otahuhu, Auckland, N.Z.  
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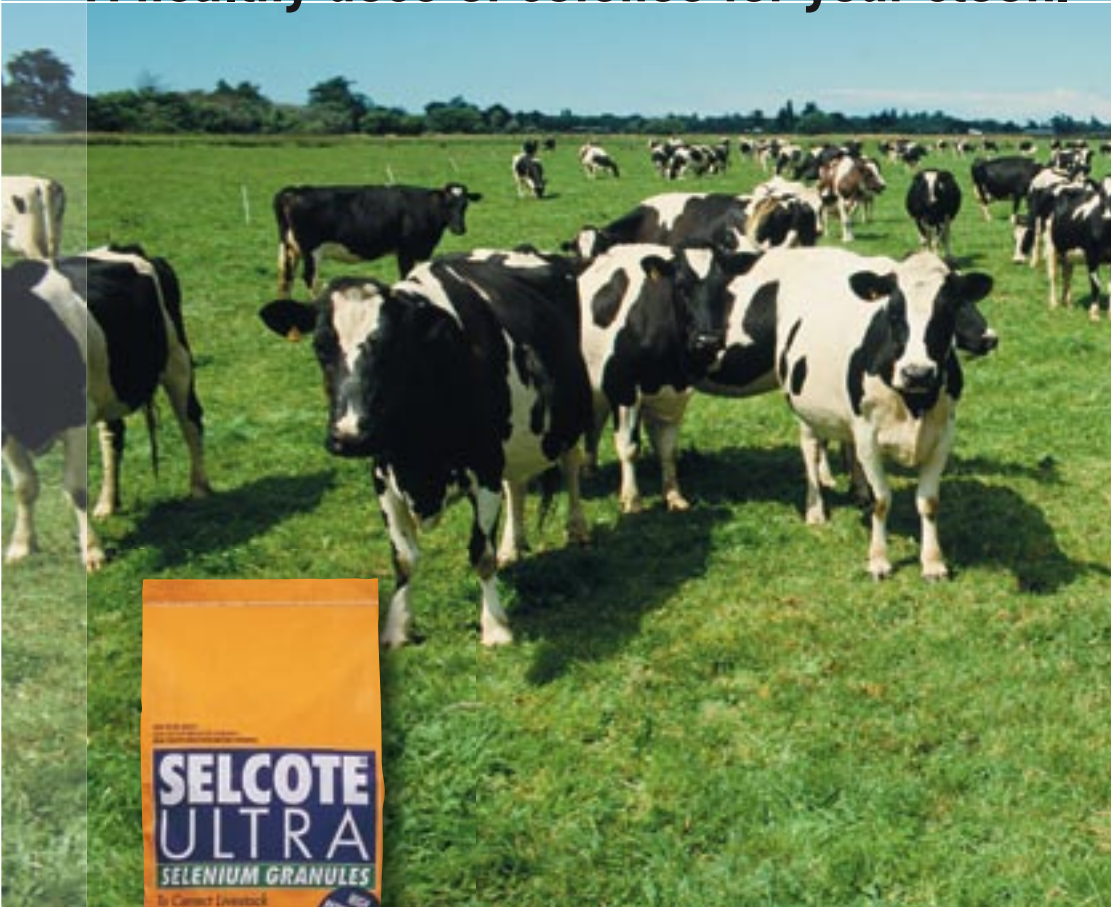


**SELCOTE<sup>®</sup>**  
**ULTRA**  
**SELENIUM GRANULES**

## The Essential Supplement For Better Growth And Bigger Profits



# Selcote® Ultra selenium granules. A healthy dose of science for your stock.



Selenium deficiency was first noted in New Zealand in the 1950's and is a result of low soil selenium, principally due to our relatively young soils and rock formations.

Selenium is known as a trace element, and is required by animals including ourselves in minute amounts. Without an adequate selenium uptake stock health can be severely affected.

Selenium is required for wool growth, sperm motility, embryo development and an efficient antibody response against disease. Selenium along with Vitamin E are important antioxidants, helping to prevent tissue damage. With adequate selenium levels your stock have the natural building blocks to reach their full potential.

While selenium is not required by plants, problems do arise when the dietary intake of grazing animals is below 20 – 50 parts per billion. Without selenium, both acute and subclinical deficiency symptoms can occur.

# Why is selenium important for healthy livestock?

Selenium is required in up to 100 specific selenoproteins within the animal, though the uses for only 30 of them have been determined to date. All these selenoproteins have various functions, including helping animals cope with stress (such as cold weather), long milking seasons and inadequate diet. Selenium is incorporated into some enzymes which reduce tissue damage due to peroxides and free radicals.

Occasionally the deficiency of selenium can be seen in the development of recognised acute disease symptoms, but more often the deficiency comes through in subclinical symptoms, which are harder to detect.

**The only way to protect animals from these symptoms is to ensure an adequate selenium intake.**

Some of these symptoms are:

**White Muscle Disease:** This disease, also known as muscular dystrophy, can affect lambs, calves, foals and fawns, causing them to be reluctant to move.

**Infertility:** Selenium deficiency in stock at mating can result in a high proportion of barren ewes/cows as a result of embryonic loss 3-4 weeks after conception. Selenium is also required for sperm production and motility.

Cattle may respond to selenium with a better return to oestrus, lessened calving difficulties, and fewer retained placentas. Sheep appear more responsive to selenium-induced infertility than cattle.

**Ill Thrift:** Selenium-deficient animals will fail to maintain optimum growth rates. Both live weight gains and wool weight gains can result when the deficiency is treated. Milk production gains have been reported in dairy herds with a mean selenium concentration of less than 120nanamols/L.

**Poor Wool Growth:** Selenium is a vital component of wool. Because wool growth occurs every day it makes large demands on a sheep's selenium reserves. Up to 20% of a sheep's total selenium is concentrated in the wool.

**Increased Disease Susceptibility:** Selenium is required for efficient antibody response helping to reduce sub clinical mastitis and other disease pressures.



Acute deficiencies are easier to recognise by the severity of the symptoms. Indeed in very selenium deficient areas, stock will die.

Subclinical deficiencies are harder to detect but often manifest as: low lambing percentages, loss of embryos, increased retention of placentas in cows, poor conception rates, inability to thrive due to increased disease pressure.

If selenium is that missing block, then stock health improvement with supplementation can be dramatic. Some Tara Hills trials in 1983 showed lambing percentages increase from 21% to 120% with the application of pasture selenium alone.

**Inadequate selenium levels in animals will have a direct affect on their performance and resulting farm profitability.**



## What areas in New Zealand are selenium deficient?

While soil selenium maps show that the Volcanic soils of the North Island, pockets in the Wairarapa, Manawatu, Waikato, Northland and virtually all of the South Island have low selenium levels - the answer is not that easy.

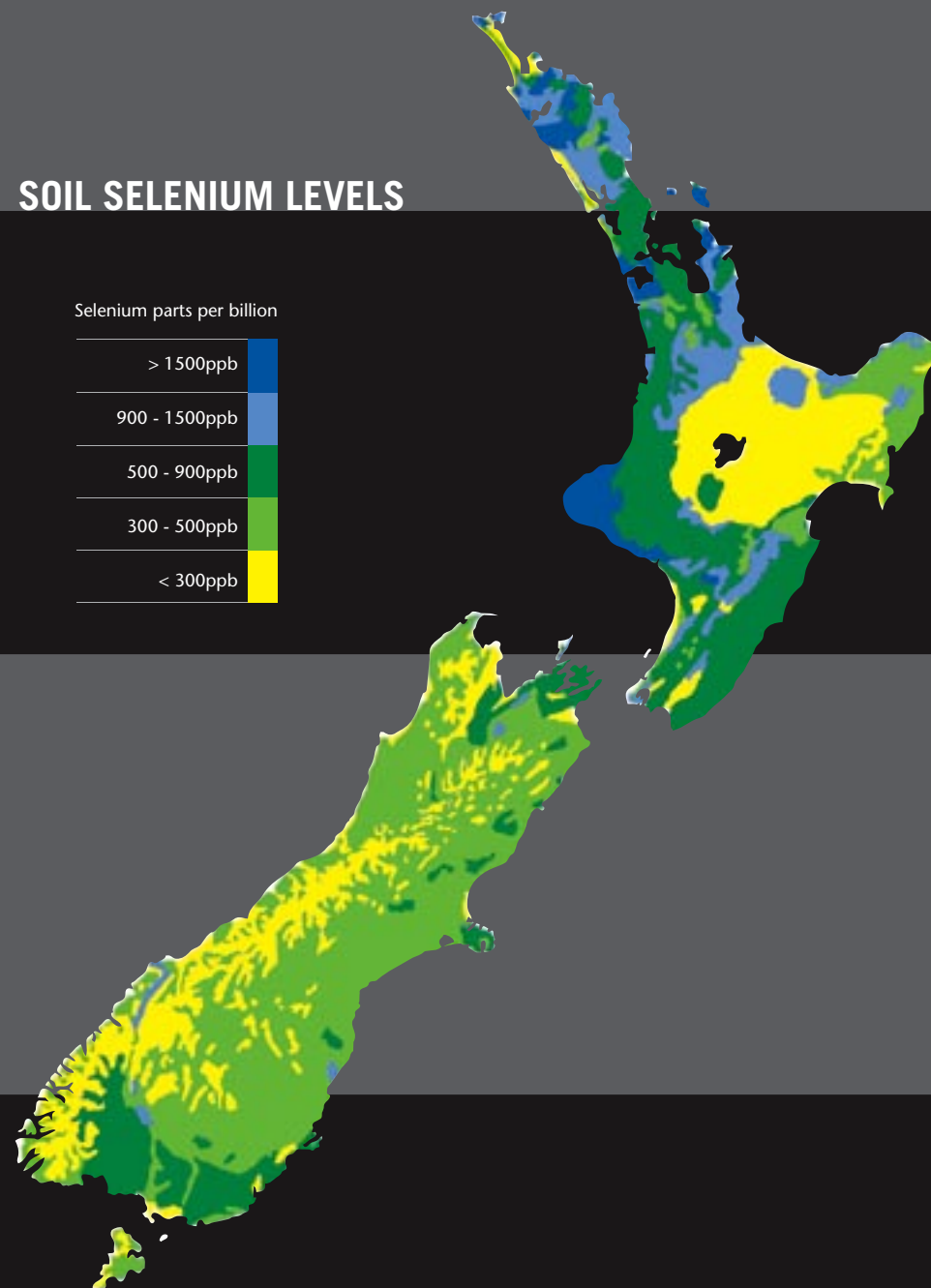
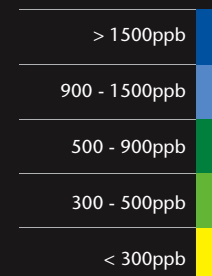
Selenium in the soil is mostly bound to the soil particles as selenites, and it is only the selenates that are readily available to be taken up by plants. Therefore a better way to determine selenium deficiency is the selenium level in pasture.

Pasture levels can fluctuate depending on the time of year, pasture species and climatic conditions. Selenium deficient pasture is quite common in the spring flush. Intensive sheep and dairy farms, where the stock are pushed hard to perform, may require higher levels of selenium than animals under less stress.

**Ultimately the best determinant of adequate selenium levels is healthy thriving stock in which the selenium levels can be determined by blood or liver analysis.**

## SOIL SELENIUM LEVELS

Selenium parts per billion



# What levels of selenium are essential?

## SOIL

Acidic basalt, granite, peat and volcanic soils combined with a rainfall above 500mm are typical of a region or soil type prone to selenium deficiency.

Indicative levels of selenium deficiency

**<500 PARTS PER BILLION - MARGINAL DEFICIENCY**

**<300 PARTS PER BILLION - SEVERE DEFICIENCY**

## PASTURE

While soil levels are the main determinant for selenium in pasture, low levels can be accentuated by clover dominant pastures and a slight suppression due to applied sulphur. Rapid pasture growth in spring can also dilute the pasture selenium levels.

**<20 PARTS PER BILLION - DEFICIENT**

**<10 PARTS PER BILLION - SEVERELY DEFICIENT**

There is a move to lifting the suggested pasture level to 40-50ppb. Vitamin E levels in pasture are important but these are generally sufficient in NZ.

## BLOOD

There are a number of methods of determining selenium levels from blood samples. Glutathione Peroxidase (GSH-px or GPx) is a measure of a selenium containing enzyme produced by the liver and reflects selenium intake about two months prior. Serum levels reflect current selenium intake while whole blood levels are between these two time periods. Alternatively liver samples can be taken from animals going to slaughter. Serum selenium levels from blood samples taken from the same animal(s) at two month intervals are the best indicator of whether selenium levels are rising or falling.

## TOXICITY

Selenium is only required in trace amounts. Too much selenium can be as damaging as too little. Chronic toxicity could be expected if stock levels were consistently 50-100 times the adequate levels shown in the tables opposite.

The tables below show levels set by MAF Qual in trials investigating selenium responsiveness. However as more work comes to light the levels may be amended. Generally there is a trend to seek higher levels.

## SHEEP

Test	Deficient	Marginal	Adequate	Units
GSH-px level (Glutathione Peroxidase)	<20 (ill thrift) <2	<35 2-4	>35 4-25	Units/g Hb kU/L @25°
Whole Blood Selenium	<10 <112	10-20 112-225	>20 >250	ug Se/L (ppb) nmol/L
Plasma Selenium	<7 <50	7-11 50-100	>11 >100	ug Se/L (ppb) nmol/L
Liver Selenium	<0.2 250	0.2-0.5 250-450	>0.5 >450	mg/kg dry(ppm) nmol/kg

## CATTLE

Test	Deficient	Marginal	Adequate	Units
GSH-px level	<10 <0.5	<20 0.5-2.0	>20 2.0	Units/g Hb kU/L@25°
Whole Blood Selenium	<10 <130	10-15 130-250	>20 >250	ug Se/L (ppb) nmol/L
Plasma Selenium	<8 <85	8-12 85-140	>12 >140	ug Se/L (ppb) nmol/L
Liver Selenium	<0.2 <600	0.2-0.5 600-850	>0.5 >850	mg/kg dry (ppm) nmol/kg fresh

## What action should you take?



### MONITOR

The best way to be sure of the selenium levels in your stock is to monitor these levels several times a year. A once a year analysis will give you the levels at a single point, but not indicate whether levels are rising or declining. Remember selenium is required year round not only at specific times.

A selenium application method which provides optimal levels over long periods is therefore essential, both in terms of convenience and efficacy.

### THE CHOICES OF SELENIUM SUPPLEMENTATION

#### 1. Direct Animal Routes:

**Drenches** - Drenches have been the traditional method used to supplement selenium. Resultant selenium blood levels are low and short lived (3-6 weeks). Relying on a selenised drench programme will generally not provide year round selenium supplementation or selenium at the crucial time from birth to weaning.

**Vaccines** - Some vaccines contain selenium. This selenium is of a readily soluble form and is at a relatively low level. Blood levels are only elevated for a short period.

**Injections** - Both soluble and insoluble forms are available. The soluble forms give a quick but short 3-6 week duration. Slow release injections must be administered under the skin in the neck (not in the muscle), selenium supplementation is sustained but cost per stock unit is high.

#### 2. Pasture Applied:

**Fast Release Granules** - This granule is based on sodium selenate and gives an initial excessive pasture peak. This peak lasts for 1 to 3 months and subsequent levels return to pre application levels after 5 - 8 months. Stock brought onto the pasture after this period may need alternative forms of supplementation until the next application. High rainfall, irrigation, thin free draining soils and some peat soils are likely to exacerbate this problem.

**Selcote® Ultra Granules** - No other form of supplementation is necessary as grazing stock receive a continuous supply of selenium naturally through the pasture. Selcote Ultra can be applied direct to the pasture (or forage crops) or conveniently added to your annual fertiliser requirements – remember to ask for Selcote Ultra, not just selenium.

**Selcote Ultra is the only patented slow release granule which provides sustained selenium levels in both pasture and animals.**

# Selcote® Ultra - the natural choice

Selcote Ultra granules have both fast and slow release forms of selenium. Upon application to pasture the fast release selenium is rapidly released and provides a quick boost to the pasture, which can be utilised by the grazing animals within days.

The slow release component releases selenates at a more gradual rate providing sustained pasture and animal selenium levels. Only a comparatively small amount of Selcote Ultra is required on each hectare as Selenium is a trace element and only required in parts per billion.

**Using Selcote Ultra is a simple, convenient and cost effective way of ensuring your stock have sufficient levels of this essential trace element – all year round naturally through their diet.**



*Selcote Ultra granules shown actual size*

## APPLICATION RATES

### Sheep / Beef / Deer Farms

Selcote Ultra should be applied at either 0.5kg/ha for 1 year supplementation or 1.0kg/ha for 2 years supplementation. The 1.0kg/ha application rate can last for 24 months because of the lower dry matter yield from these pasture types.

### Dairy Farms

Because of the elevated dry matter production and higher soil activity levels in dairy pasture, Selcote Ultra should be applied at 1.0kg/ha for 12 months supplementation. While 1kg/ha is recommended for dairy farms, applications of 0.5kg/ha will provide a basal level of selenium, above deficiency. There is however a growing trend to provide high-producing cows with selenium levels well above deficiency. Variations to application regimes, such as split season applications are possible. Higher rates than recommended should only be undertaken with close monitoring and veterinarian supervision.

**Forage Crops:** Because animals require selenium all the time, forage crops such as swedes, lucerne, kale, maize and cereals should also be treated. Application rates will vary from 0.5kg/ha to 1.0kg/ha depending on the amount of dry matter produced. Best results are achieved by applying to the drill row at sowing.

**Silage:** Selenium levels in supplements such as silage are as equally important as pasture levels. Selenium levels in silage can be boosted by early spring application to pasture or at sowing with maize silage.

## COVERAGE

For best results the entire farm should be covered at the recommended rates. Alternatively paddocks can be banded, provided the full quantity for each paddock is applied in the paddock and stock have free grazing access to the selenised pasture. In high country farms elevated selenium levels achieved on the flats will help stock through the key selenium requirement periods of mating, winter and lambing.

## EASY APPLICATION WITH SELCOTE ULTRA

**1. Spread with your spring or autumn fertiliser or applied nitrogen.** When ordering fertiliser specify the addition of Selcote Ultra (not just Selenium). Selcote Ultra will be blended at the works or can be mixed on site during fertiliser application.

**2. Self Spread.** Selcote Ultra can be purchased from agricultural merchants and spread easily with a small bike/trailer mounted spinner. To help even coverage, add a little fertiliser to provide a greater bulk to spread.



**Timing:** Selcote Ultra is best applied prior to pasture growth periods i.e. spring or autumn to coincide with fertiliser applications. Spring applications tend to give a flatter pasture response curve while autumn applications can result in a peak selenium level the following spring. However because of the slow release properties, application timing is not critical. If stock are selenium deficient, Selcote Ultra should be applied as soon as possible to boost their selenium status.

# Selcote Ultra New Zealand case studies

Productivity gains:  
Live weight: mob 1 were 12% heavier than control mob.  
Wool weight: mob 1 averaged 17% more wool than control mob.

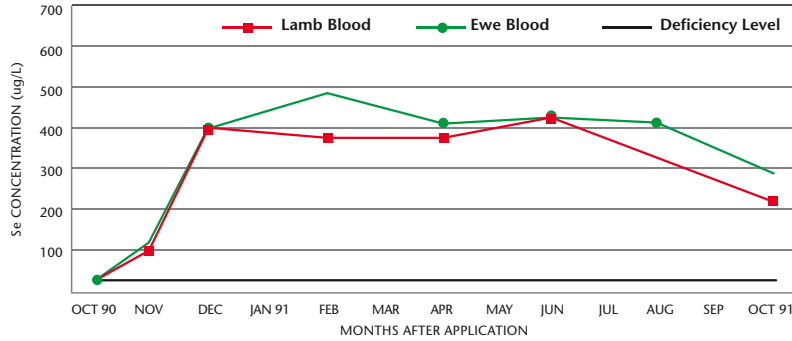
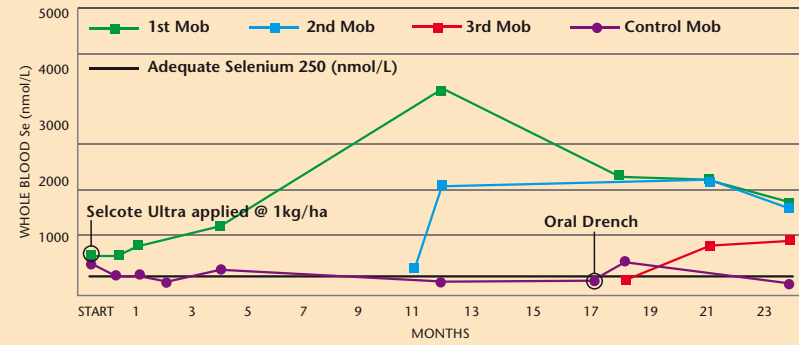
Note: Pasture was irrigated to give a total equivalent rainfall of 2000mm p.a

## TARA HILLS (Central Otago) Irrigated Pasture AgResearch Trial

Selcote Ultra applied once at 1.0kg/ha for 24 months supplementation. 1st mob run on treated pasture for full 24 months. 2nd test mob brought onto treated pasture at 11 months. 3rd test mob brought onto treated pasture at 18 months.

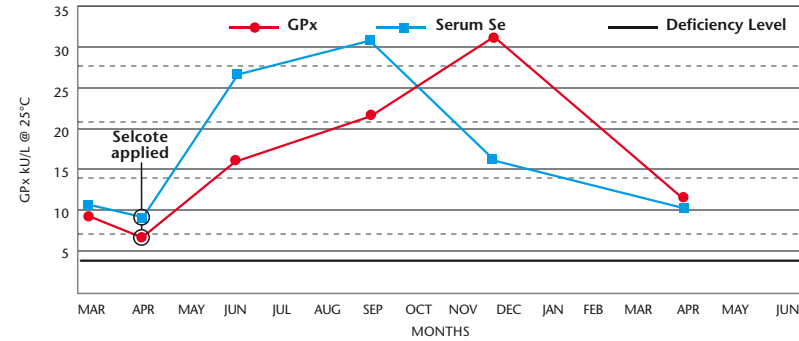
Control mob run on unseledised pasture for full 24 months. All three test mobs picked up selenium from the treated pasture and lifted their blood selenium levels well above deficiency.

The control mob given an oral Se drench at 17 months due to stock losses. Drench gave small and short-lived increase in blood selenium levels.



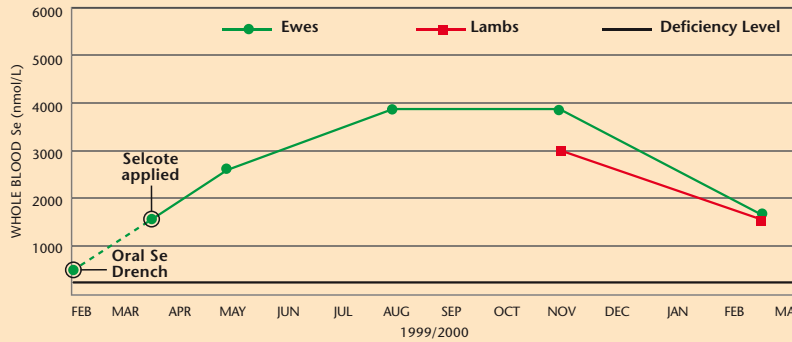
## SOUTHLAND Sheep / Lambs / Spring

Selcote Ultra applied over entire farm in spring at 0.5kg/ha, using spinner mounted on ATV/Tractor. Twelve tagged Ewes and Lambs were sampled for blood selenium levels at regular intervals. Resulting selenium levels were well above deficiency levels for the full 12 month period.



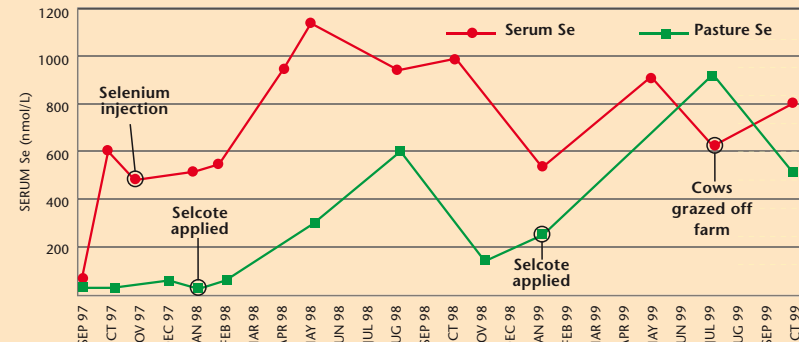
## WAIKATO Dairy

Selcote Ultra applied at 1.0kg/ha in Autumn for 12 months supplementation. Blood levels determined by GPx and Serum Selenium. Autumn application gave a peaked response the following spring as elevated Selenium levels coincided with peak spring pasture production. Continued annual applications are likely to even out the troughs in dairy/autumn application.



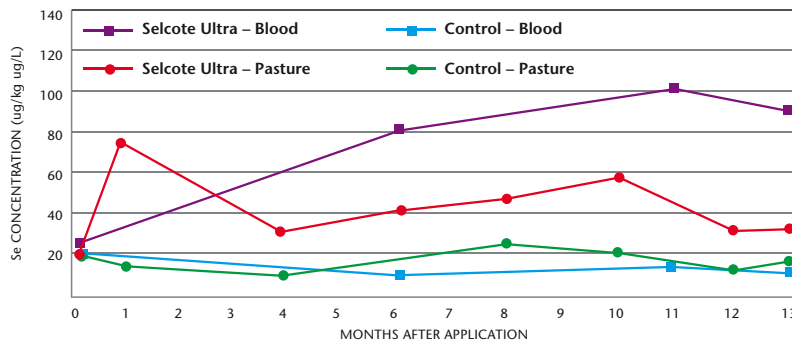
## SOUTHLAND Sheep / Lambs / Autumn

Selcote Ultra applied at 0.5kg/ha over farm after early February short lasting oral drench. Note blood levels the following spring of both ewes and new lambs held well above initial low levels.



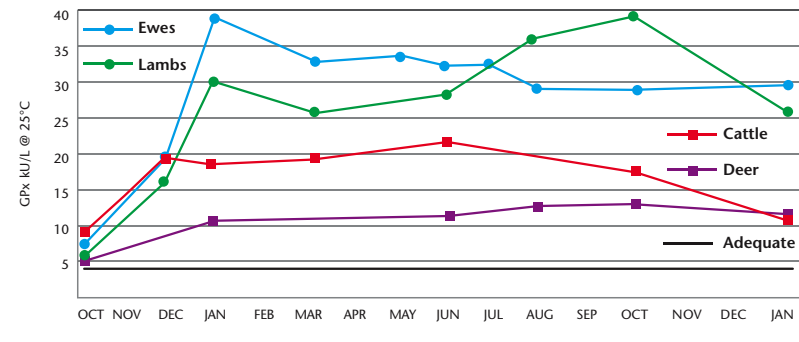
## TARANAKI Dairy

Trial looking at successive annual applications of Selcote Ultra at 1.0kg/ha. Note initial blood levels achieved by direct selenium injection and subsequent rise due to selenium ingested through treated pasture. Note also the effect of off-farm grazing on non selcoted pasture.



## WAIRAKEI MAF TRIAL Sheep (Taupo)

Selcote Ultra applied over test pasture at 0.5kg/ha with a control mob run on non-selcoted pasture. Study conducted on selenium deficient volcanic soil. Pasture levels rise rapidly due to fast release component and sustained by slow release selenium. Stock sampled at 5, 10 and 12 months. Application in Summer - 4th January. Control Stock quite deficient and showing deficiency symptoms.



## NORTH OTAGO Deer, Sheep, Cattle

Selcote Ultra applied at 0.5kg in spring for 12 months supplementation. One application lifted all classes of stock well above deficiency. Note the differences in selenium levels achieved grazing the same pasture.