

**NEW**

# ENSURE YOUR CATTLE REACH THEIR PEAK POTENTIAL



**Marks-Min<sup>®</sup>**  
**ZMSC with B12**

Injectable Trace Minerals with Vitamin B<sub>12</sub> for Cattle

 **Boehringer  
Ingelheim**

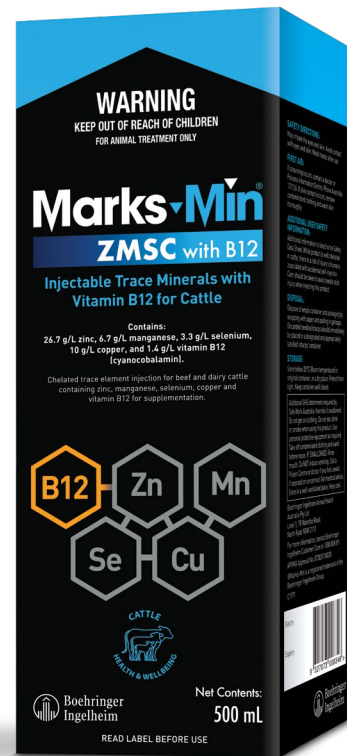
# MARKS-MIN

## The essential building blocks for optimal health including vitamin B<sub>12</sub> in one convenient injection.

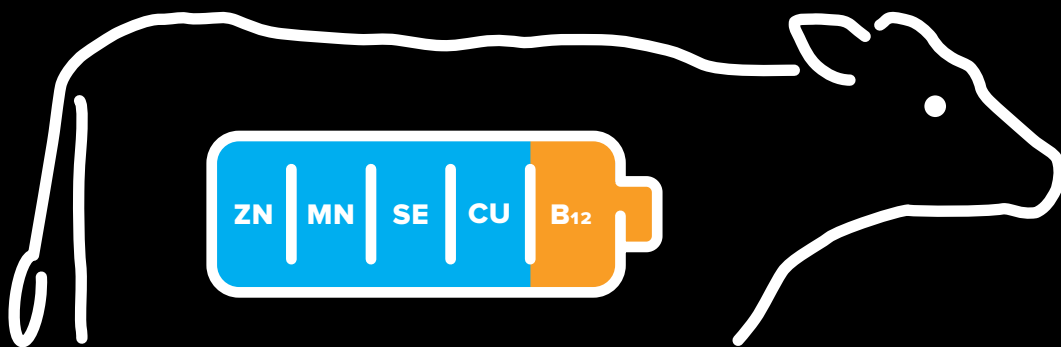
Marks-Min ZMSC with B<sub>12</sub> is a trace mineral injection for cattle that contains the trace minerals zinc, manganese, selenium and copper along with vitamin B<sub>12</sub>, which are required for optimal health, production and fertility.

Optimising trace mineral and vitamin B<sub>12</sub> levels at critical times, like calving, mating and drying off, can have a positive impact on growth, the immune system and reproduction in livestock.

Marks-Min ZMSC with B<sub>12</sub> provides trace minerals and vitamin B<sub>12</sub> in one convenient rapidly-absorbed injection, ensuring essential trace minerals for optimal health are available together with vitamin B<sub>12</sub>, which is critical for energy production, to help support the best response to trace mineral supplementation.



## Recharge their growth, health, reproduction and energy with Marks-Min ZMSC with B<sub>12</sub>



### ZINC

#### Has a role in:

- ▼ Cell production
- ▼ Skin, hair and hoof growth
- ▼ Antioxidant functions
- ▼ Disease resistance
- ▼ Reproduction/fertility

### MANGANESE

#### Has a role in:

- ▼ Protein metabolism
- ▼ Antioxidant functions
- ▼ Bone, cartilage and connective tissue development
- ▼ Reproduction/fertility
- ▼ Embryo survival
- ▼ Glucose synthesis and utilisation

### SELENIUM

#### Has a role in:

- ▼ Disease resistance
- ▼ Muscle growth and function
- ▼ Reproduction/fertility
- ▼ Thyroid hormone functions
- ▼ Antioxidant functions

### COPPER

#### Has a role in:

- ▼ Iron metabolism and red blood cell development
- ▼ Bone development
- ▼ Nerve function and myelination
- ▼ Antioxidant functions
- ▼ Disease resistance
- ▼ Reproduction/fertility

### VITAMIN B<sub>12</sub>

#### Has a role in:

- ▼ Energy production and metabolism
- ▼ DNA synthesis
- ▼ Growth
- ▼ Immune system function
- ▼ Reproduction/fertility
- ▼ Milk production

# HOW TO OPTIMISE PRODUCTION BY MANAGING MINERALS

## What are trace minerals and why are they important?

Trace minerals are essential to a wide range of processes within the body, but are only required in very small amounts. These minerals may make up only a small portion of an animal's daily dietary intake, but play an important role in everyday life, especially for the key functions of growth, reproduction and immune defence. Present in the soil to varying degrees, trace minerals are taken up by plants and then absorbed by livestock when consumed.

Zinc, manganese, selenium, copper and cobalt are among the most important trace minerals in livestock. New Zealand research has shown that pastures can be significantly

deficient in these minerals throughout the country, meaning what our livestock are eating may not meet the daily requirements for one or more of these minerals<sup>1</sup>.

Supplementation is an important part of any animal health management plan to manage these trace minerals for optimum health and performance.

Vitamin B<sub>12</sub> is important for energy production in ruminants. Normally cobalt is taken up through the diet and converted to vitamin B<sub>12</sub> by rumen micro-organisms. Vitamin B<sub>12</sub> is then absorbed and is an essential part of gluconeogenesis, the process by which ruminants create glucose for energy.

If cobalt levels are low in pasture, vitamin B<sub>12</sub> levels can fall and this can limit energy available for body processes.

## Class of stock and their requirements

Every animal has a requirement for trace minerals and vitamin B<sub>12</sub> throughout their life. At key times such as during rapid growth or lactation, the demand for these is greater. If trace mineral levels are below requirements, then production potential may be limited. Production targets to ensure consistent annual calving are already within a tight window, and any limitation to hitting these targets can have long term consequences for production, profitability and sustainability.

Young stock and weaners have a greater requirement for trace minerals due to their rapid growth rates and need to develop strong and robust immune systems.

Animals that are stressed for any reason, such as feed restriction, transport or changed surroundings (e.g. mixing into new social groups), also have increased requirements as they still need to grow and maintain immune function.

Bulls, heifers and cows also have greater requirements for trace minerals and energy heading into the mating season. Trace minerals play an important role in the function of both the male and female reproductive systems. If levels are not sufficient, these complex systems may not function to their full potential.

Trace minerals and vitamin B<sub>12</sub> are essential for many bodily functions, including those supporting immune status, disease prevention, and reproduction.



Trace minerals and vitamin B<sub>12</sub> are also known to be required for maintenance and function of the immune system, essential to combat and prevent infection and diseases.

Using an injectable supplement prior to high demand periods can assist in maintaining mineral and energy levels and support optimum production.

<sup>1</sup> Knowles and Grace 2014; Knowles, S.O., Grace, N.D. 2014 A recent assessment of the elemental composition of New Zealand pastures in relation to meeting the dietary requirements of grazing livestock. *Journal of Animal Science*, 92 pp303-310

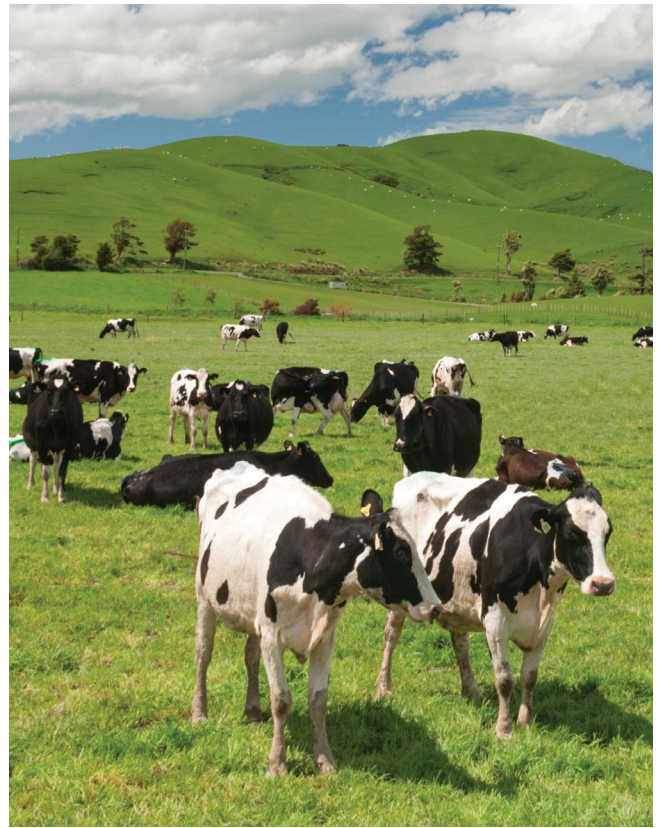
# DOSAGE AND TREATMENT TIMES

- ▼ Administer by subcutaneous injection (under the skin)
- ▼ Following withdrawal of the first dose, product can be used for 9 months from opening.

AGE OF CATTLE	INJECTION DOSE RATE
Up to 1 year	1.5 mL per 50 kg
From 1-2 years	1.5 mL per 75 kg
Over 2 years	1.5 mL per 100 kg

# WITHHOLDING PERIODS

**MEAT:** Zero (0) days | **MILK:** Zero (0) days



# TREATMENT PLAN

## CALVES

- ▼ At day 1
- ▼ At weaning

## DAIRY COWS

- ▼ 4 weeks before calving
- ▼ 4 weeks before mating or insemination
- ▼ 4 weeks before drying off

## BULLS

- ▼ 3 months before mating
- ▼ Bulls at mating

## HEIFERS

- ▼ 4 weeks before mating
- ▼ Every 3 months

## BEEF COWS

- ▼ 4 weeks before mating
- ▼ 4 weeks before calving

## ADDITIONAL

- ▼ Every 2 months in wet conditions

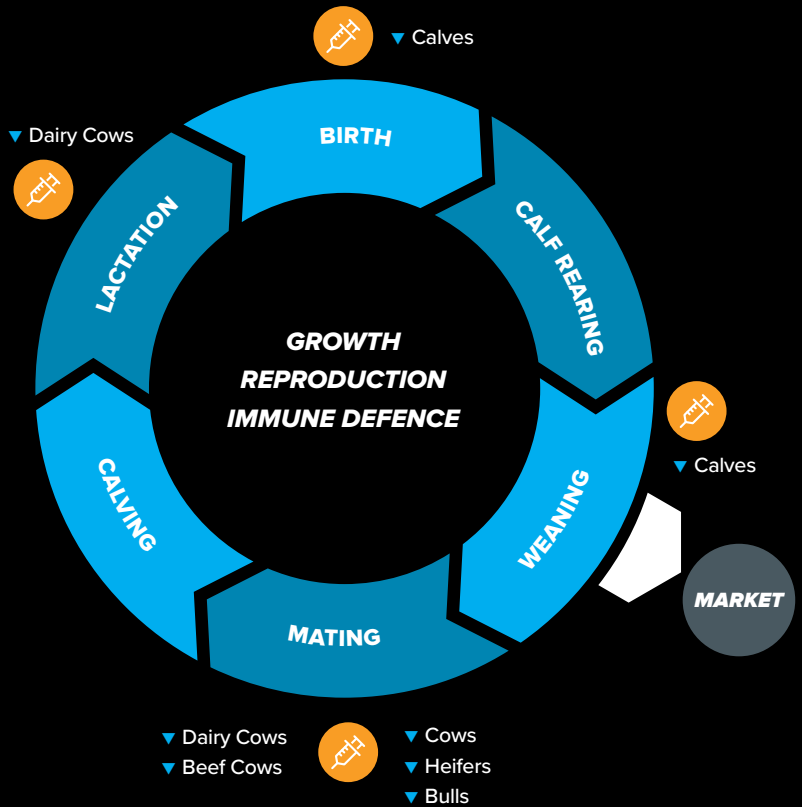


Figure 1: The trace mineral levels of an individual can be a rate limiting factor determining animal performance. Managing trace mineral levels especially during high demand periods is an important part of optimising production potential and managing animal health

# VITAMIN B<sub>12</sub>

## The final step to peak production

New Zealand's soils, pastures and crops often fail to provide sufficient trace minerals required for optimal performance. Supplementing those minerals is key and there are many ways to do this. However, in a world first, Marks-Min ZMSC with B<sub>12</sub>, developed here in New Zealand, combines zinc, manganese, selenium and copper with the energy-boosting properties of vitamin B<sub>12</sub>. Energy is significantly important for ruminants - it's the backbone of all body functions.

Cows can't eat glucose for energy, they have to make their own and this is where the addition of vitamin B<sub>12</sub> comes in. Vitamin B<sub>12</sub> is essential for the production of glucose and therefore the energy required to ensure the other minerals will be optimised for real gains.

## Optimal health and performance

The individual trace mineral status of an animal can be a rate limiting factor determining animal performance. If trace mineral levels are less than optimal, production may suffer, with processes such as growth, reproduction and immune defence not functioning to their capacity.

Optimising trace mineral and vitamin B<sub>12</sub> levels by using feed or oral supplements may not be successful as there may be variation in individual intake, low absorption from the gastrointestinal tract, and complex interactions with other dietary components. These can limit the success of a supplementation program. Using injectable mineral supplementation can avoid these variables by being rapidly absorbed into the bloodstream and made readily available to support optimal health and production. Minerals not immediately required may be stored in the liver and mobilised as required.

Managing trace mineral levels to ensure there is adequate supply, especially during high demand periods, is an important part of maximising production potential and managing animal health.

## Supporting optimal health and performance



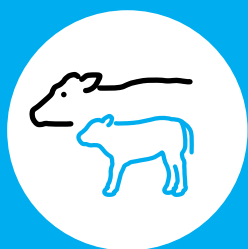
### **GROWTH**

Marks-Min ZMSC with B<sub>12</sub> provides elements that support growth by aiding cell, bone, muscle, cartilage and connective tissue growth and development, as well as protein metabolism, DNA production, thyroid function and nerve myelination.



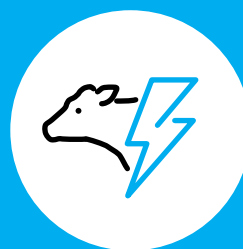
### **IMMUNE DEFENCE**

Marks-Min ZMSC with B<sub>12</sub> provides elements that support immune defence by aiding function of the immune system and white blood cells that help combat and resist the establishment of infections.



### **REPRODUCTION**

Marks-Min ZMSC with B<sub>12</sub> provides elements that support reproduction by aiding the development of male and female reproductive organs and their functions, the process of fertilisation and also the maintenance of pregnancy.



### **ENERGY**

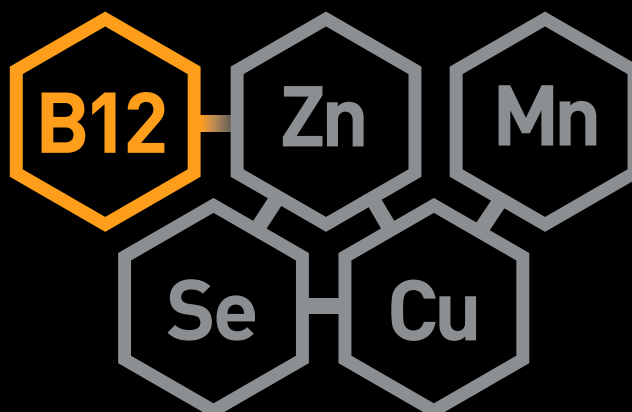
Vitamin B<sub>12</sub> plays a key role for the production of energy in livestock. Energy is required for all bodily processes and it is the backbone of all production.

# INJECTABLE APPLICATOR

The Marks-Min injectable applicator with forward selectable dose volume has been specifically developed in NZ to be used with all Marks-Min injectable solutions. Applicators are available from your veterinary clinic on purchase of Marks-Min products.

Refer to the 5 mL applicator for calves

Refer to the 12 mL applicator for cattle



**PROUDLY AVAILABLE FROM YOUR LOCAL  
PARTICIPATING VETERINARY CLINIC.**