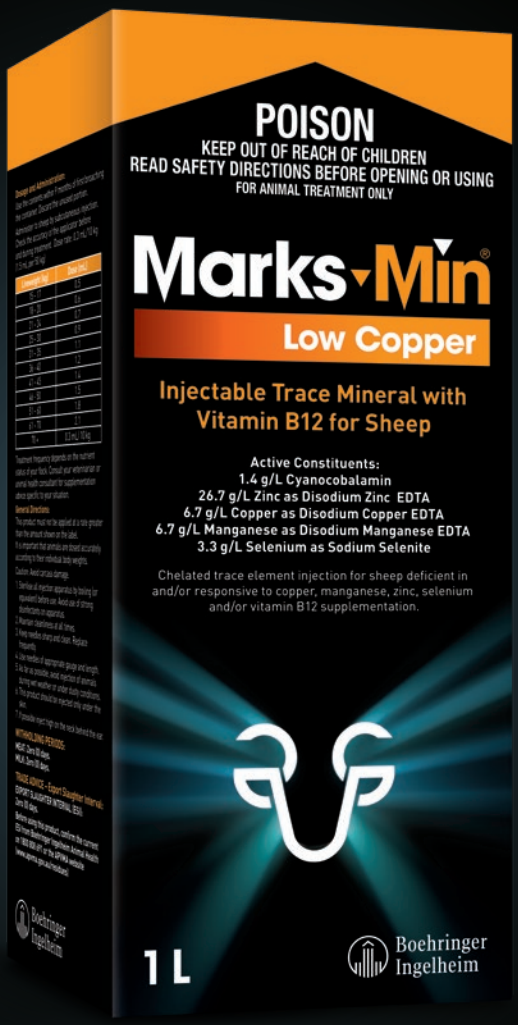
REMARKABLE RESULTS

Marks-Min®

Low Copper

Injectable Trace Mineral with Vitamin B12 for Sheep



IMMUNITY

FERTILITY

ENERGY

GROWTH

PROVEN* trace mineral injection for sheep with the added benefit of vitamin B12 in **one convenient injection**

What is Marks-Min?

Marks-Min injectable products for sheep contain the trace minerals selenium, manganese, zinc, with or without copper, along with vitamin B12, which are required for optimal health, production and fertility. Optimising trace mineral and vitamin B12 levels at critical times like lambing, joining and times of oxidative stress, can have a positive impact on health, immune status and reproductive capacity of livestock.

Marks-Min provides trace minerals and vitamin B12 in one convenient rapidly absorbed injection, ensuring essential trace minerals for optimal health are available, together with energy provided by vitamin B12, to help support the best response to trace mineral supplementation.

How to optimise production by managing minerals

WHY TRACE MINERALS ARE IMPORTANT

Trace minerals are essential to body function and are absorbed by livestock when pasture and soil are consumed. Copper, selenium, manganese, zinc and cobalt are among the most important trace minerals in livestock.[1]

However, they are amongst the most common mineral deficiencies in sheep in Australia.[2] Sub-optimal mineral balance at critical times such as joining, lambing and when grazing improved pastures for rapid growth, can mean that accelerated trace mineral and vitamin requirements are not met for high performing flocks.

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

WHY VITAMIN B12 IS REQUIRED WITH A TRACE MINERAL INJECTION

Sheep are susceptible to cobalt (precursor to vitamin B12) deficiency. Spring lambing ewes, and lambs born in spring, are exposed to rapidly growing pastures and substantial glucose demands. Vitamin B12 is essential for glucose production and for methionine synthesis, an essential amino acid required for milk and wool production. Ewes require additional B12 to support high glucose demands for lamb growth in utero and during lactation. Lambs need B12 for growth and thermogenesis (heat production).

Many of the regions that are deficient in cobalt are simultaneously deficient in copper and selenium. Given the similar distributions in deficiency, it makes sense to ensure that the risks of deficiency in other key trace element nutrients are covered. Additionally, there is a potential synergistic role for vitamin B12 with copper, manganese, selenium and zinc in oxidative metabolism. Glucose (produced via vitamin B12 dependent enzymes), is required to regenerate antioxidants that contain these trace minerals.

MARKS-MIN AND REPRODUCTION

The demand on modern ewes to be highly fertile, increases the requirements for trace minerals and requires a positive energy balance. The trace minerals in Marks-Min play a vital role in fertility, ovulation, embryo survival and spermatogenesis. Vitamin B12 deficiency can cause ill thrift and loss of appetite, which can be corrected by vitamin B12 supplementation.

Table 1. Ewe trace mineral requirements vary depending on reproductive state.[3]

Class of sheep	Approximate weight	Description	Copper requirement (mg/d)	Selenium requirement (mg/d)	Cobalt requirement (mg/d)	Manganese requirement (mg/d)	Zinc requirement (mg/d)
Ewes	60 kg	0 gain	4	0.05	0.11	16	30
		Breeding	5.6	0.2	0.18	22	44
		Late gestation (single)	8.6	0.19	0.21	31	51
		Late gestation (twins)	11.4	0.21	0.19	40	59
		Peak milk	11.1	0.68	0.46	25	79

MARKS-MIN AND LAMB GROWTH

Lambs are particularly vulnerable to deficiency if their dam was deficient in cobalt and was not supplemented with vitamin B12 during pregnancy. Lambs from ewes deficient in cobalt have been shown to be slower to start suckling.[4] Lambs depend on liver stores of vitamin B12 established from the ewe, and B12 in milk, and cannot produce their own vitamin B12 until the rumen is functional. Colostrum is an important source of trace minerals and vitamin B12 for the lamb.

Marks-Min is an ideal way to supplement trace minerals and vitamin B12 in pre-lambing ewes to support health and lamb growth. Marks-Min can also be used in lambs from 15 kg to supplement trace minerals and vitamin B12 for optimal health and growth.

Table 2. Requirements for trace minerals in growing lambs increase with growth rates.[3]

Class of sheep	Approximate weight	Description	Copper requirement (mg/d)	Selenium requirement (mg/d)	Cobalt requirement (mg/d)	Manganese requirement (mg/d)	Zinc requirement (mg/d)
Lambs	30 kg	200 g/d gain	5.5	0.36	0.22	21	24
		200 g/d gain	9.1	0.69	0.31	33	40

MARKS-MIN AND OXIDATIVE STRESS

Oxidative stress is caused by the build-up of cellular waste from physiological processes. Antioxidants are a vital defence in managing this cellular waste to maintain cellular processes and health. The trace minerals in Marks-Min are critical in antioxidant metabolism.

Natural changes in oxidative stress are associated with reproductive status and growth. Environmental effects such as heat stress, parasitism and green pastures high in polyunsaturated fatty acid (PUFA) increase oxidative stress. If uncontrolled, oxidative stress may influence reproduction, growth and immune function.

Marks-Min supplies the building blocks required for antioxidants important in maintaining optimal health and performance.

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

MARKS-MIN AND HIGH PERFORMING PASTURES

High performance pastures (annuals, monocultures, high fertiliser rates, high moisture content, high growth rates) can result in a myriad of trace mineral deficiencies. The causes can range from changes to the nutrient profile of the pastures via stage of growth, fertiliser regime and varieties through to some of the physiological impacts caused by increases in stocking rates and individual animal growth rates. Mineral supply from pastures may not therefore be sufficient to support high levels of production at all times of the year (see figure 1).

While high quality pastures may drive faster animal growth rates, increasing growth rates and lambing percentages also need to be supported by balanced mineral and vitamin B12 to meet accelerated metabolic demands.

Trace mineral and vitamin B12 supplementation with Marks-Min helps optimise nutrition and support the increased requirements of rapidly growing sheep and lambing ewes.

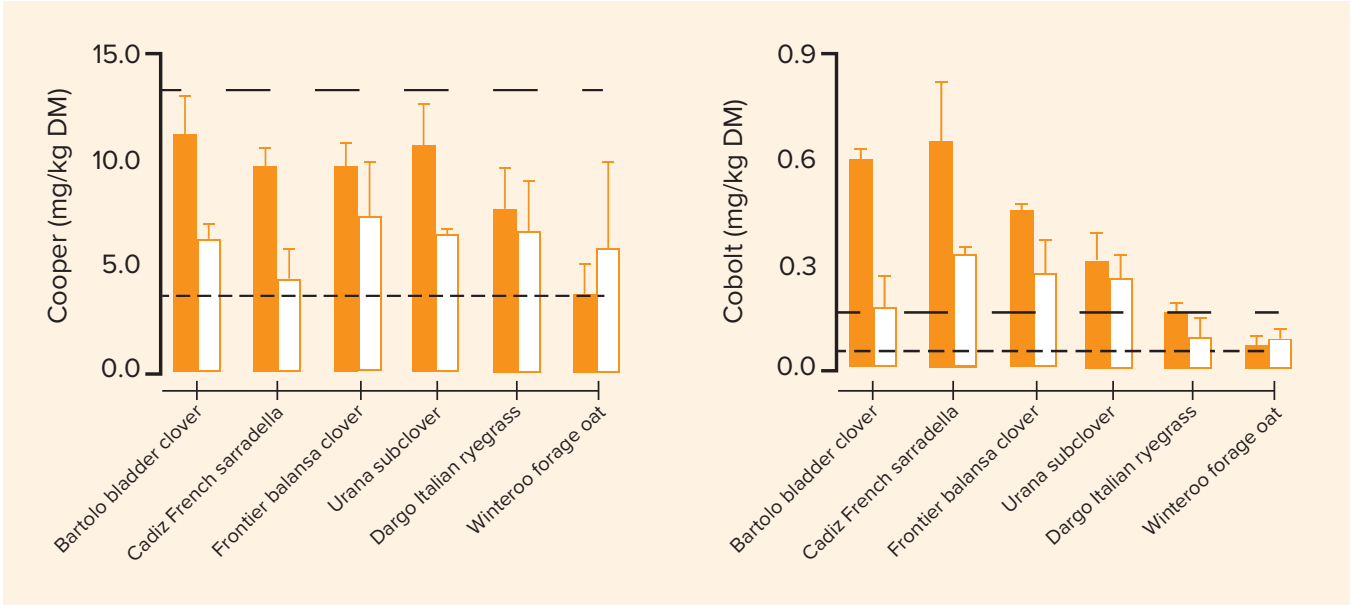


Figure 1. Variation of copper and cobalt in a range of pasture legumes and grass species collected in spring (filled columns) or summer (open columns). Dotted line indicates the bottom of the minimum requirement range for sheep (usually adults at maintenance), dashed line indicates the top of the requirement range (usually growing, pregnant or lactating sheep.[2]

MARKS-MIN COPPER FREE OR MARKS-MIN LOW COPPER

While copper is an essential trace mineral and the amount required increases with increased growth rate, lambing percentage and milk production, excess copper can be toxic. Plant testing is the first place to start. This will tell you whether copper concentrations are high (>12 mg/kg) and whether molybdenum (>2 mg/kg) may reduce copper availability. If the plants are high in copper and low in molybdenum, sulphur and iron, then check the blood and liver status of the sheep with your veterinary advisor.

If copper supplementation is required, Marks-Min Low Copper Injectable Trace Mineral with Vitamin B12, designed specifically for sheep, provides an appropriate dose of copper.

SUPPORTING OPTIMAL HEALTH AND PERFORMANCE

GROWTH

Marks-Min provides elements that support growth by aiding bone, joint and muscle development and function (Cu, Mn, Zn, Se) and energy metabolism (Vitamin B12)

IMMUNE DEFENCE

Marks-Min provides elements that support immune defence by aiding in the function of the immune system and white blood cells that help resist establishment of infection (Cu, Mn, Zn, Se)

REPRODUCTION

Marks-Min provides elements that support reproduction by aiding the development of male and female reproductive systems, the process of fertilisation and also the maintenance of pregnancy (Cu, Mn, Zn, Se)

ENERGY

Vitamin B12 plays a key role for the production of energy in livestock. Energy is required for all body processes and is the backbone of all production

TREATMENT PLAN FOR OPTIMAL PRODUCTION

Animal Class	Timing
Rams	12 weeks pre-joining
Ewes	4 weeks pre-joining 4 wees pre-lambing
Lambs	From 15 kg

WITHHOLDING PERIODS

MEAT WITHHOLD PERIOD

MILK WITHHOLD PERIOD

EXPORT SLAUGHTER INTERVAL (ESI)

DOSAGE AND ADMINISTRATION

Marks-Min Low Copper and Marks-Min Copper Free

0.3 mL/10 kg (1.5 mL per 50 kg)

- Administer by subcutaneous injection (under the skin)
- Following withdrawal of the first dose, unused product should be discarded after 9 months.
- Treatment frequency depends on the nutrient status of your flock or herd. Consult your veterinarian or animal health consultant for supplementation advice specific to your situation.
- DO NOT re-treat animals for 8 weeks after last treatment.

For more information call
1800 808 691 or visit your local store.

livestockfirst.com.au

*Boehringer Ingelheim data on file.

References: 1. Lee, J., Knowles, S.O. and Judson, G.J., 2002. Trace element and vitamin nutrition of grazing sheep. In: Sheep Nutrition. Ed Freer, M & Dove, H. Wallingford: CAB International, pp.285-311. 2. Masters, D., Norman, H. and Thomas. D. 2019. Minerals in pastures – are we meeting the needs of livestock? Crop & Pasture Science 70: 1184-1195. 3. NRC (2007) Nutrient Requirements of Small Ruminants. National Academies Press. Washington, D.C. 4. Fisher, G., and MacPherson, A., 1991. Effect of cobalt deficiency in the pregnant ewe on reproductive performance and lamb viability. Research in Veterinary Science 50(3):319-327.

See product label for full claim details and directions for use.

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