

The strategic use of injectable trace minerals to improve fertility and health



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Improving productivity

What should we aim for?

- Tightening the lambing pattern
 - Lambs born earlier in the season have a longer opportunity to gain weight before weaning
 - This means heavier average weaning weights = \$\$
- Increase conception rates
 - Particularly maiden ewes
 - More lambs on the ground = \$\$
- Maximise lamb potential
 - Set them up for strong production in the future = \$\$



What can we do to achieve this?

- Genetics
- Nutrition
- Choosing the right animal health program
- New concept
 - Strategic treatment of injectable trace minerals



Traditional trace mineral approach

- Trace minerals are minerals that are required in very small (trace) amounts by all animals
 - Eg. Selenium, Zinc, Manganese
- Deficiencies in these minerals animals can cause severe abnormalities and production losses
- They are therefore essential for healthy, productive animals



Current concepts on trace minerals

Deficiency

Toxicity



- Selenium
 - nutritional myopathy
 - retained placenta
 - embryonic loss
 - Increased mastitis
- Copper
 - enzootic ataxia
 - retained placenta
 - embryonic loss
 - poor growth
 - steely wool

- Selenium
 - Acute- laboured breath, excessive salivation, blind staggers, paralysis, death
 - Chronic- anorexia, lameness, loss of hair, stiff joints
- Copper
 - Acute- severe abdominal pain, diarrhoea, dehydration, death
 - Chronic- blood in urine, depressed and weak

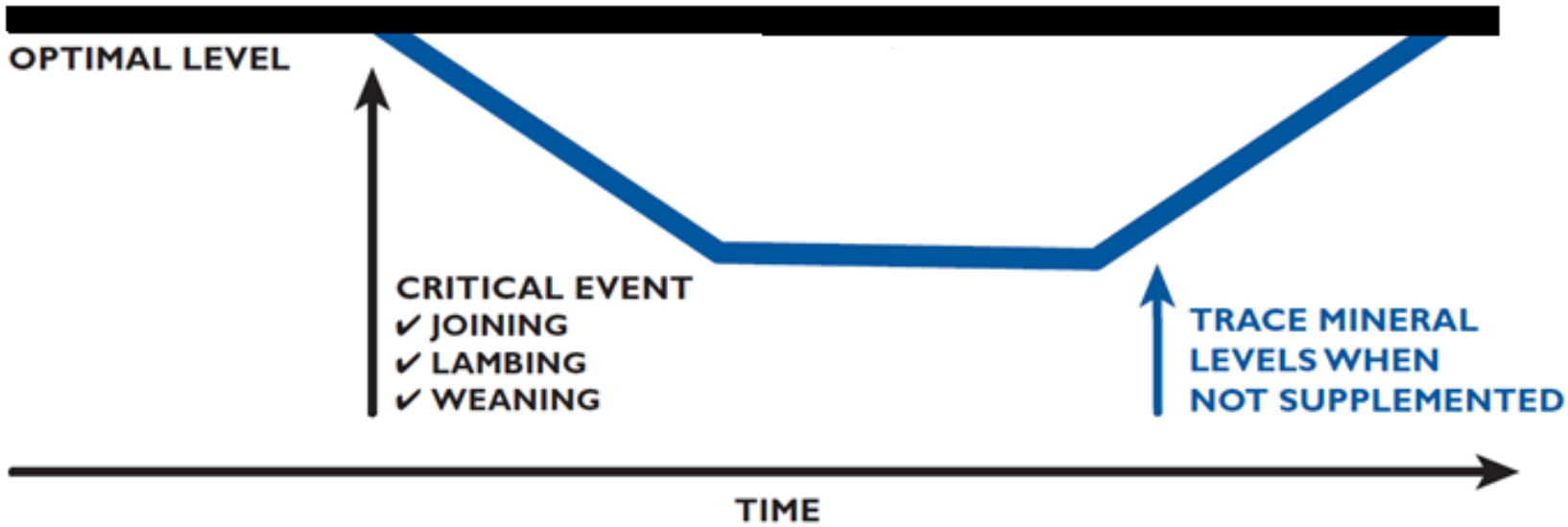


New Concept

- Animals which usually have adequate trace mineral levels can still respond to trace mineral supplementation at critical times in the production cycle when trace mineral demand is high
- Before joining (ewes and rams)
- Before lambing
- Lambs (over 20kg)



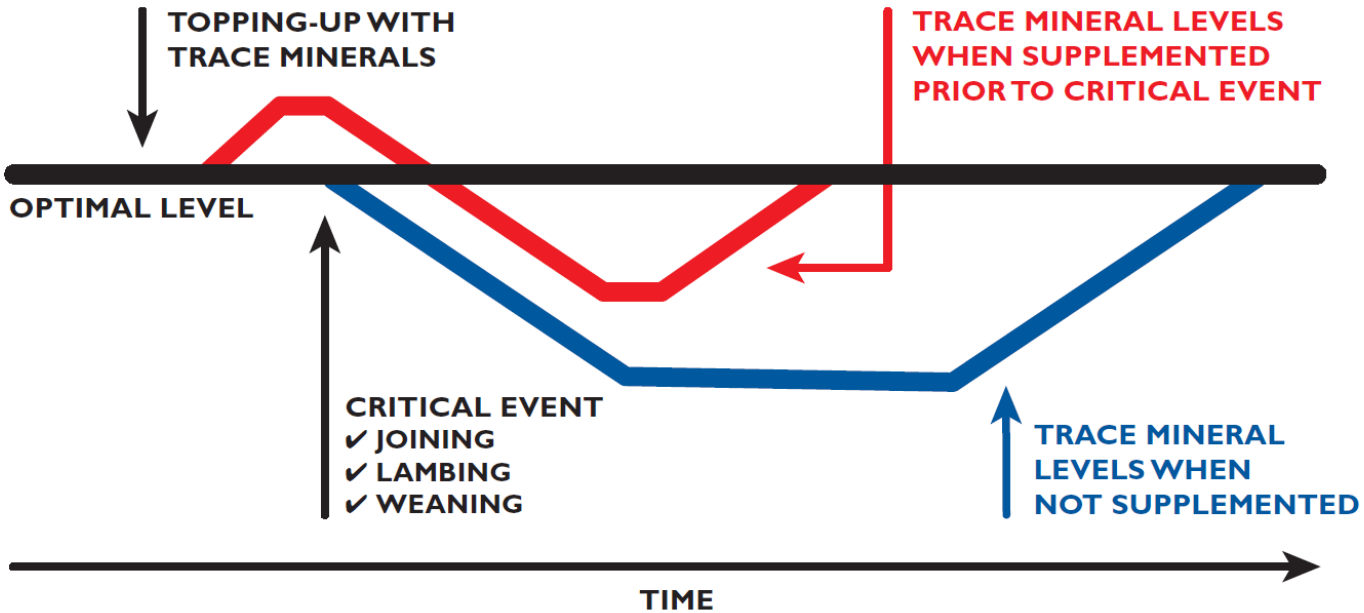
- Trace mineral demands are not consistent
- At critical times trace mineral demands increase
- Eg. the ewe transfers a proportion of her trace mineral supply to the lamb during the last trimester of pregnancy



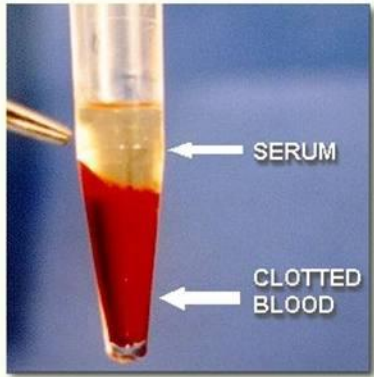
The effect of injectable trace mineral supplementation

Reduces the drop in TM status

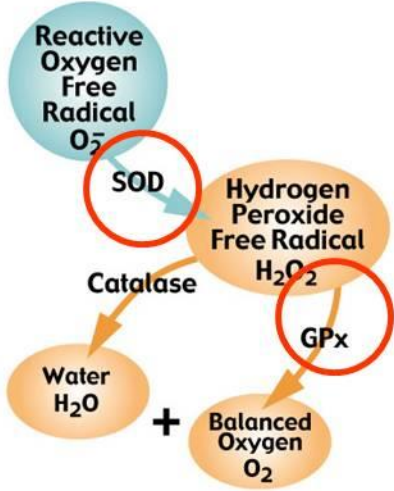
Recovery from reduced TM status is faster



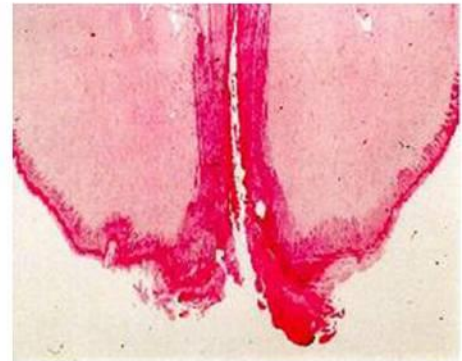
How are trace minerals used in the body?



TRANSPORT



ENZYME

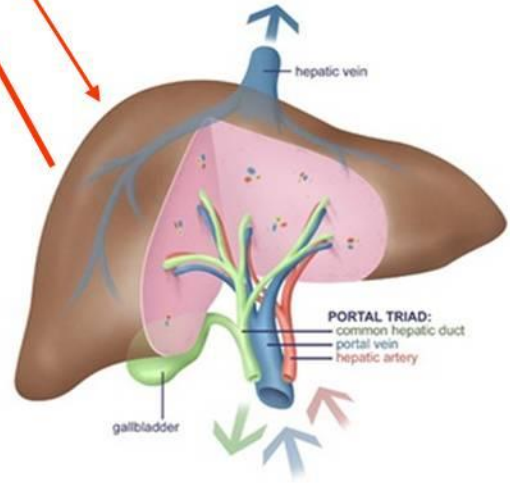


STRUCTURAL

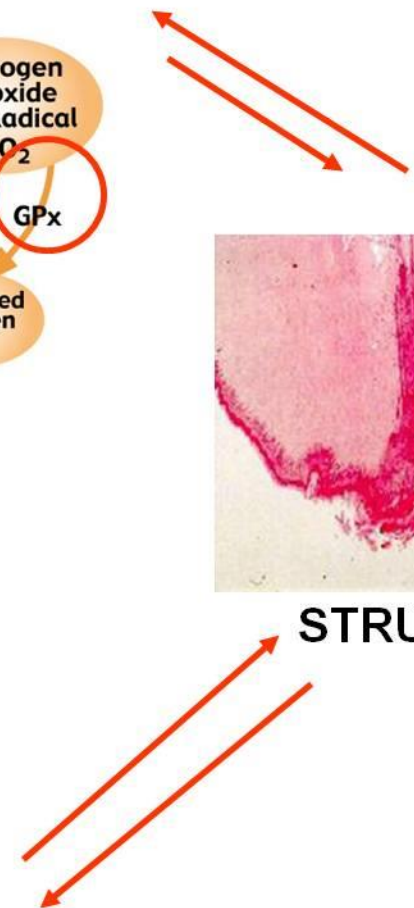


Kidney

EXCRETION



STORAGE & RELEASE & EXCRETION



What is Multimin?

Multimin Copper-Free Injection for Sheep and Cattle contains:

- Selenium 5 mg/ml
- Zinc 40 mg/ml
- Manganese 10 mg/ml



- Subcutaneous injection ensures all the minerals are immediately absorbed
- Can be used up to 9 months after opening (9 month broached vial claim)
- Nil meat or milk withholding or ESI periods



Why an injection?

- Absorption of trace minerals through the gastrointestinal tract (GIT) is poor
 - Manganese ~1%
 - Zinc ~15%
 - Selenium ~30%
- Absorption can also be affected by other minerals (antagonists) in the diet.
 - Eg. High levels of calcium and iron decrease manganese absorption
- An injection allows the minerals to bypass the typical absorption mechanisms in the GIT and delivers minerals under the skin to be absorbed directly into the blood



When will injectable trace minerals have the most impact?

- Before joining
 - 1 month before joining in ewes
 - 3 months before joining in rams
- Before lambing
 - 1 month before lambing
- Lambs over 20kg



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Pre-joining in Rams

	Sperm Production	Fertility	Disease Resistance	Hoof Health
Selenium	✓	✓	✓	
Zinc	✓	✓	✓	✓
Manganese	✓	✓	✓	

The trace minerals in Multimín have important roles in:

- Sperm quality and production
- Disease resistance
- Hoof health



Why inject trace minerals 3 months before joining in rams?

- The trace minerals take 3 to 4 weeks to be incorporated into the enzymes which help with fertility and health
- Sperm production takes 6 to 8 weeks
- Therefore it takes about 3 months for the improvement in sperm production



Pre-joining in Ewes

Selenium, Zinc and Manganese have many roles in fertility including:

- The fertilisation process
- Preparing the reproductive tract for pregnancy
- Maintaining the pregnancy
- Preventing embryonic loss

What does this mean?

Increased conception rates

Shorter lambing interval

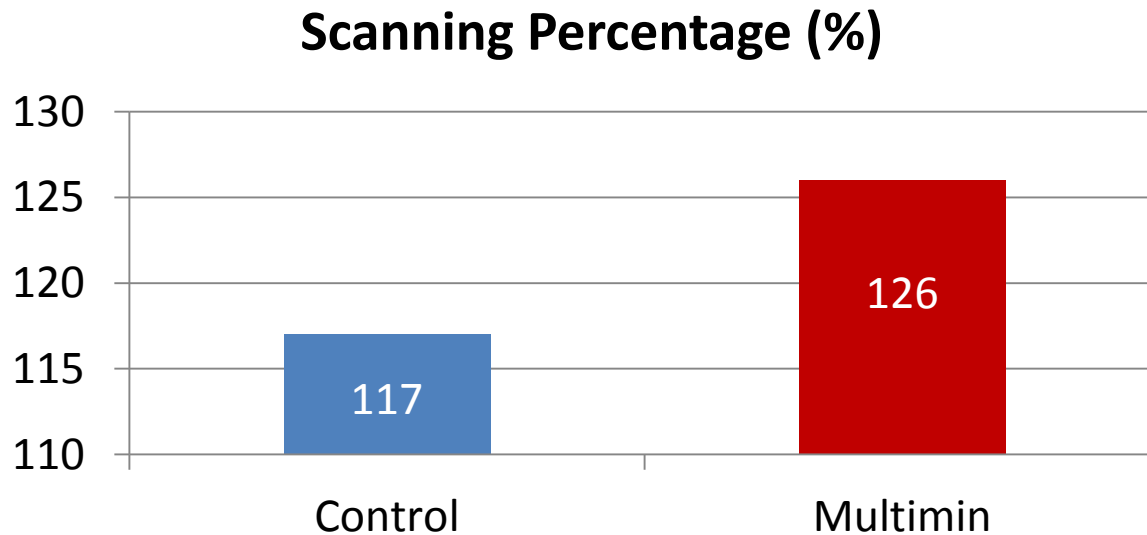


Trial Work

- 4 trials across Australia
 - Lucindale, SA
 - Kingston, SA
 - Esperance, WA
 - Woorndo, Vic
- 3829 Merino ewes
 - 1903 Control ewes - no treatment
 - 1926 Multimin ewes - 1ml/50kg
- Treated 30 days before the rams were introduced
- Ewes were scanned ~85 days after joining started



Trial Work



Ewes treated with Multimin had **higher scanning rates** than control ewes

Ewes treated with Multimin were **1.4 times** more likely to conceive than control ewes (7.5% empty vs 9.4% empty)

$P = 0.0005$ Virbac Data on File (2012)



Return on Investment

1926 ewes had **173 extra lambs** at scanning by using Multimin (9% increase at scanning)

Sale Price of Lamb:	\$80
Cost of extra lamb born	\$20
Extra profit per 100 ewes	\$405
Treatment cost per 100 ewes	\$65

Return on investment of 6 : 1

Assumptions:

- Based on data from Southwest Farm Monitor Project 2011
 - 25% lamb mortality from birth to marking, cost of production
- No value placed on extra benefits possible with Multimin**
 - Health
 - Weight gain



Pre-lambing injection

- Replaces minerals in the ewe that have been passed on to the foetus (lamb)
- Ewe recovery after lambing
 - Prepare the reproductive tract for the next pregnancy
 - Help prevent mastitis, retained placenta, uterine infection
- Increases trace mineral supply in lambs before their born
 - Improve survivability and health



How do trace minerals help lambs?

Trace minerals have essential roles in disease resistance, growth and development

	Disease Resistance	Bone Development	Hoof Health	Muscle Function	Skin and Coat Health
Selenium	✓			✓	
Zinc	✓	✓	✓		✓
Manganese	✓	✓			

A healthy lamb with strong bones and muscles has greater potential to gain weight and deal with stress better



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Summary

- Trace minerals have important roles in health and fertility
- Treating with injectable trace minerals before critical events when trace mineral demands are increased can have production benefits
- Before joining, lambing, weaning.



Questions?



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