HIT THE TARGET EVERYTIME

CUE™ injection

- Flexible dose: 2ml (100mg) or 4ml (200mg) dose (Adult Cattle)
- Quickly elevates copper levels and is dose responsive
- Use in conjunction with CopperEX bullets (persists for 39 weeks into lactation)
- No overall effect on milk solids
- Studies show can be used up to 10 days prior to planned start of mating
- Suitable for Dairy, beef cattle, sheep & deer.

copperEX™ injection

- Slow release
- Depot forming suspension
- Effective up to 6 months

copperEX™ bullets

- Slow release
- Easy application
- Solid dose technology
- Excellent safety

NO STICKY GELATIN CAPSULES

References:
1. Hawkins, D (publication pending 2014 NZVJ) – Effects of subcutaneously injected CaCu EDTA on concentrations of copper in liver, milk production and reproductive performance in New Zealand dairy cows.
2. Grace, N, The Mineral Requirements of Grazing Ruminants, NZSAP, 1994.
3. Parnell CUE Clinical Study (2000). An on farm study to evaluate the therapeutic efficacy of calcium copper edetate injection (CUE Injection) on liver copper status in adult dairy cattle.
4. Hawkins, David (2002) The safety of an injectable formulation of calcium copper EDTA in dairy cows during early lactation. NZ Dairy Vets Newsletter Vol 20 (2): 16-18.
5. Parnell Laboratories CopperEX Bullets Response Study, 2003-2004.
6. Shepherd, Richard and Allen, Terri (2005) CUE Injection & CopperEX Injection site Study.
7. Hawkins, David (2006) CUE Pre-mating study, publication pending.
8. Hawkins, David (2007) CUE Injection 4ml Study, publication pending.
9. Target level cited by ND Grace et al (2010) *High and variable copper status identified among dairy herds in the Waikato region by concentrations of Cu in liver sourced from biopsies and cull cows,* New Zealand Veterinary Journal 58 (3), 130-136.
10. R Laven & R Ellison (2011), *Trace elements and micronutrients for dairy cattle: Update,* Proceedings of the Society of Dairy Cattle Veterinarians of the NZVA.

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Registered pursuant to the ACVM Act 1997, No. A7711 (CUE Injection), No. A9210 (CopperEX Bullets) and No.A7224 (CopperEX Injection).

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Cue for Cattle

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COVER COWS WITH CUE

QUALITY GUARANTEED

CUE Injection covers cows for copper
...Elevates ...Maintains ...Prepares

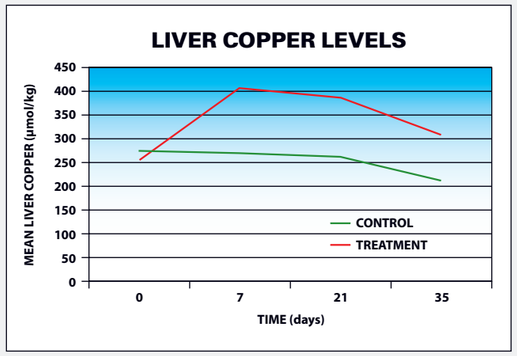
DOSE CERTAINTY with CUE Injection

- Maintaining liver copper levels during the peak demand of lactation is a key objective of year-round copper management in dairy cattle.
- CUE Injection is the only injectible copper product backed by continuous research on New Zealand dairy farms.
- CUE studies show that on farms known to experience copper deficiency, treatment should be repeated for best results.

ELEVATE Copper levels at drying off

In 2000, CUE Injection clinical studies[3] in New Zealand showed a 2ml dose of CUE consistently delivered 150 µmols/kg of copper to each cow's liver within 7 days, irrespective of starting copper levels and secondary deficiency challenge.

- The recommended liver copper "threshold" level for New Zealand dairy cows at drying off is at least 400-500µmol/kg[9].
- For deficient cows consider injecting 3-4mls to ensure copper sufficiency.



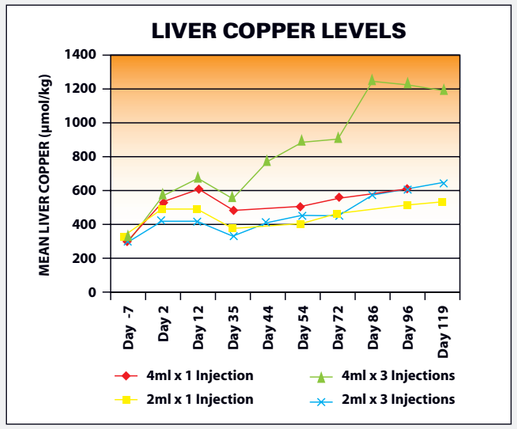
MAINTAIN Copper levels into lactation and through calving

In 2002 a New Zealand study[4] concluded that the use of 4ml of CUE Injection to supplement lactating dairy cattle with copper is:

- Well tolerated.
- Has no overall negative effect on milk solids production.

In 2006 a study[8] in three lactating herds in New Zealand tracked repeat dosing of 2ml and 4ml CUE Injection at 6 weekly intervals.

- A single 4ml dose of CUE increased copper levels by 300µmols, double the response of a 2ml injection.



PREPARE the cow for mating

According to Underwood in ***The Mineral Nutrition of Livestock***, adequate copper levels are important to ensure acceptable conception rates[1].

In 2006, a study was conducted in New Zealand with 2800 cows in 7 herds[7] to understand the effect of balancing the necessity for attaining liver copper levels pre-mating with the timing of pre-mating administration.

- Cows were treated with 4mls of CUE Injection 10 days prior to Planned Start of Mating (PSM)
- In 5 out of 7 herds there was no impact on submission or conception rates
- In 2 out of 7 herds there was a statistically significant reduction in conception rates

On balance, it appears that the optimal time for copper administration is greater than 10 days prior to PSM.

TESTING for Copper Deficiency

Monitoring the herd using either liver biopsies or samples from cull cow livers[9] is recommended to complement blood, pasture and soil analysis.

- The liver is the body's storeroom for copper, containing up to 70% of the total body copper[2]. Copper levels in the blood will only decrease when liver stores are exhausted.
- Liver copper levels less than 100µmol/kg fresh weight indicates depletion. In cattle 95µmol/kg liver copper is considered marginal, and less than 45µmol/kg is deficient.
- Aim is to keep concentrations above 95µmols in Spring by attaining high liver copper in late Autumn. The recommended liver copper "threshold" level for New Zealand cows at drying off is at least 400-500µmol/kg[9].

Copper Supplementation

- Supplementing copper to dairy cattle during the period of zinc supplementation for facial eczema is no longer recommended as it appears free copper ions in the liver may make cows more susceptible to the effects of facial eczema sporidesmin[10].
- Consequently, injecting copper at drying off, offers a practical means of achieving the target threshold.

CUE Coverage Program

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			AUTUMN			WINTER			SPRING			
Program 1 CUE Injection*			CUE - Dry			CUE - Calve			CUE - Mating			
			ELEVATE			MAINTAIN			PREPARE			
Program 2 CUE Injection + CopperEX Bullets			CUE - Dry			CopperEX Bullets - Calve / Mating						
STAGE OF LACTATION CYCLE (timing dependent on individual herd)			DRY COW THERAPY			CALVING			MATING			

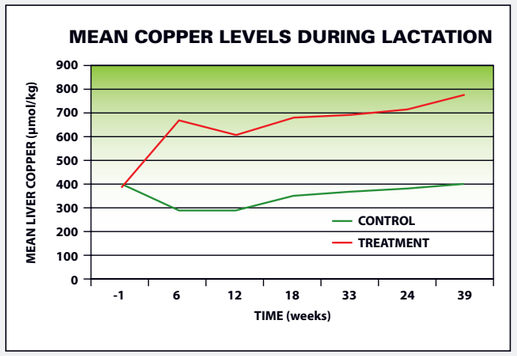
***NOTE:** Dosage may be repeated every 3 months in cattle. The optimal treatment program should be established by monitoring the animal's copper status.

CopperEX Bullets - the ideal companion to CUE Injection

CUE Injection quickly elevates copper levels at drying off. CopperEX Bullets can be used to maintain copper levels into the next lactation and through to mating.

A New Zealand study[5] conducted in 2003/2004 in three South Auckland herds showed:

- Liver copper levels continue to decline for the first three months of lactation without supplementation.
- Elevated liver levels from 30g CopperEX Bullets persist for at least 39 weeks into lactation.
- Transfer of Copper from CopperEX Bullets to the liver is effectively complete within 6 weeks.



CopperEX Bullets are also ideal for use in beef cattle where animals are handled less frequently. With unsurpassed ease of administration, and no risk of injection site reactions and associated carcass trim losses, CopperEX Bullets are the ideal choice.