

# Trace Element SUPPLEMENT for Cattle



By Dr. Danie Odendaal

**A** deficiency of trace elements can have a detrimental impact on, among other things, fertility and the immunity of livestock without the farmer realising it. This can cause significant production losses.

Prevent production losses by strategically adding the right combination of trace minerals and vitamins before critical stages in the production cycle.

Injectable trace minerals and vitamins are a direct means of administration where deficiencies occur. This is because the interactions in the gastro-intestinal tract is bypassed or where the levels of trace elements in the feed are too low.

Trace minerals and vitamins are required in combination because the action of many of the functional enzymes formed overlaps or is built up by more than one element.

If the trace minerals in their elemental form have been administered with an injection, one restriction is the free minerals that are still reactive in the unbound form. It remains so until it converts in the liver into its functional form, which are then enzymes with a specific function in the body. Reactions by free minerals can be further reduced if there are simultaneously enough antioxidants such as vitamin E and vitamin A readily available in the blood circulation to prevent this reaction during the initial blood phase.

The most difficult trace mineral to replenish is selenium. There is a small difference between the levels at which a deficiency can be replenished and the levels at which it can be cytotoxic for the body.

## UNIQUE FORMULATION

Information was obtained from an international research study<sup>1</sup> that proved selenium methionine (the organic form of selenium) is much less toxic at high levels than the inorganic sodium selenite. So it was decided to go ahead and put selenium methionine to the test in an injectable form.

According to the same study, vitamin E should also be used to try to prevent poisoning. The action of vitamin E as an antioxidant is aimed at preventing the formation of free radicals and tissue damage.

The big challenge was to establish a formula whereby water-soluble minerals are combined with fat-soluble vitamins in a stable injectable form. The result is a stable micro-emulsion, formulated with the use of the latest technology.

## RESEARCH TRIALS

The formula was further tried in South African conditions by testing it in beef cattle, dairy cattle and sheep. The difficulty in using the injectable trace elements is to achieve long-term storage of them in the storage organs, such as the liver.

The research was done by Dr Thys Snyman and statistical processing was done by Prof Peter Thompson. Dr Alf Lategan (Cape Cross Veterinary Hospital) also assisted with the dairy cattle trial. The result undeniably found that the organic form of selenium (selenium methionine) in the new injectable formulation gives significant increases in long-term liver levels in sheep, as well as beef cattle.

The uptake of other trace minerals, such as copper, zinc and manganese (which is included in the same formula at lower levels than current injectables) achieved equivalent blood and liver levels. It is thanks to the new micro-emulsion formula that the efficiency of its absorption or distribution has improved.

The research in dairy cattle proved that blood levels achieved with the inclusion of vitamin E remain high for the first 120 hours after the injection is applied. This is for additional prevention of reactions that can be caused by minerals in their free form.

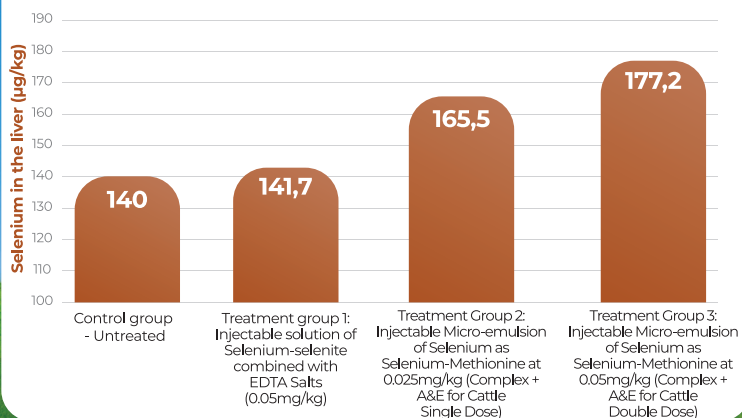
## CONCLUSION

The conclusion from the research trials conducted in beef cattle, dairy cattle and sheep is that the unique micro-emulsion formula, which contains trace minerals and fat-soluble vitamins, is an effective formula for injectable replenishment of trace element deficiencies.

In this new injectable form, selenium methionine can be applied very efficiently for long-term selenium supplementation.

SOURCES: 1 Reference: Tiwary, A.K., Stegelmeier, B.L., Panter, K.E., James, L.F., Hall, J.O. "Comparative toxicoses of sodium selenite and selenomethionine in lambs." Journal of veterinary diagnostic investigation. 18:61-70 (2006).

## SELENIUM LEVELS IN THE LIVER OF BEEF CATTLE 30 DAYS AFTER TREATMENT



## THE IDEAL BALANCE OF

### VITAMINS

+

### MINERALS

FOR OPTIMAL PERFORMANCE OF YOUR HERD!<sup>1</sup>  
OPTIMISE YOUR ANIMALS<sup>2,3,4</sup>  
Immunity | Enzyme function  
Fertility | Growth

## Complex + A&E FOR CATTLE



Product name: Complex + A&E for cattle Registration number: G4120 Act 36/1947 (South Africa). Composition per mL: Vitamin A 25000 IU, Vitamin E 60 IU, Selenium 1,25 mg, Copper 4 mg, Zinc 11 mg, Manganese 2,7 mg. Export countries: Botswana - BV2100106(A [P.O.M.]), Namibia - VJ7/192/1930(S), Registration holder: Kyron Animal Health (Pty) Ltd, Co. Reg. No. 2004/021847/07, Unit 45C, 45 Parkview Street, Highway Business Park, Bonthuiskraal, Fv-31, Beaufort, 0157, South Africa.  
References: 1. Callaway, S.P., Matheron, J.A., Kobayak, K. & Wong, S.D. 2011. Microemulsion safety as pharmaceuticals: Implications for multi-drug delivery. International Journal of Pharmaceutics, 326: 425-432. 2. Hovde, T.S. & Hovde, B. 2011. The use of blood analysis to evaluate trace mineral status in ruminant livestock. Veterinary Clinics of North America: Food Animal Practice, 27: 255-260. 3. Lopez-Alonso, M. 2012. Trace Minerals: Not too much, not too little. International Scholarly Research Network Veterinary Science. doi: 10.5402/2012/704825. 4. Walther, M.J. & Gruber, S.P. 2006. Minerals & Vitamins for Sheep - Extension Article, available online at: <http://www.sheep101.com/mineralsandvitamins.html>.

