

Injectable trace minerals: a solution to combat livestock heat stress this summer

With forecasts predicting another long hot summer ahead for northern regions, trace mineral supplementation is one effective solution to help combat heat stress in livestock over the coming months, says animal health company Virbac Australia. “High temperatures can affect everything from conception and fertility rates to immunity, meat quality and production loss, leading to significant economic impacts for producers,” reports Virbac Australia’s Technical Services Veterinarian Dr Paula Gonzalez-Rivas. “In extreme cases, it can even lead to livestock mortality.” Cattle begin feeling uncomfortable above 25°C – which means that heat stress will be an issue across all Australian livestock regions. For northern regions, high heat load resulting from more extreme humidity is an even greater problem. What’s often surprising is that it’s not only extremely high daytime temperatures that trigger heat stress. Warmer night times can have more of an impact, says Dr Gonzalez-Rivas. “Hot nights can be dangerous for livestock, as it’s harder to thermoregulate, dissipate heat accumulated during the day, and reduce their core temperature. That places them under continuous stress, increasing respiration, heart rate and water intake, and placing a strain on multiple physiological processes. In fact, recent research has revealed air temperatures rising as little as just 1.5°C above average can decrease conception rates by as much as 5%¹. Even before birth, calves suffer the negative consequences of heat stress if cows were heat stressed during late pregnancy².” “Heat stress affects the animal’s oxidative status, it increases the production of free radicals and reduces the activity of antioxidant enzymes, leading to oxidative stress. In both beef cattle and sheep, oxidising agents present in the meat lead to lipid and protein peroxidation affecting muscle fibre structure, resulting in high drip loss, undesirable meat colour and shorter shelf life. For females, heat stress can also lead to much higher rates of embryo mortality, while also affecting sperm concentration and viability in males,” says Dr Gonzalez-Rivas. Livestock Compliance & Project Co-ordinator at Bindaree Beef Group, Corina Muckenschnabl, is a big believer that it pays to be preventive rather than reactive when it comes to heat stress in cattle. “Our pre-summer checklist always includes a review of our heat stress management plan where we conduct a risk assessment based on cattle breed and shade infrastructure at our Myola Feedlot in Northern New South Wales. The Cattle Heat Load Toolbox (CHLT) calculates our heat load index threshold to determine if our stock are at low or high risk for heat stress and allows us to proactively manage the risk of heat stress at our site. Although the CHLT alarms us via a text message when we may need to implement our heat stress management plan, we need to be prepared well before we hit our heat load index threshold.” It’s clear that heat stress has real potential for devastating losses in terms of both performance and production – but the good news is that it can be effectively managed. Virbac Australia advises farmers and producers to act now and will be running free webinars on ways to minimise the impact of heat stress in livestock over summer. A pre-summer review of preparedness for heat stress is a great idea. This should include an examination of the livestock environment, including site characteristics, infrastructure and condition, to provide good shade and water sources, and even fans and sprinklers in intensive production environments. “Adequate water is essential,” Dr Gonzalez-Rivas explains. “It’s worth remembering that animals under heat stress lose much more water through respiration and perspiration, often requiring up to five times more water than usual.” Having a good summer nutrition program that includes trace mineral supplementation is also key. Dr Gonzalez-Rivas recommends using a trace-mineral injection like Multimin injection to improve antioxidant activity. Antioxidants are an ideal heat stress abatement strategy, and Multimin adds important trace minerals like manganese, zinc, selenium and copper, to help boost antioxidants, reproductive performance and immune function^{3,4}. We also recommend increasing energy density to compensate for reduced feed intake,” says Dr Gonzalez Rivas – “including slowly fermentable starch to reduce the amount of heat released in the rumen during fermentation⁵, as well as supplemental fat that bypasses the rumen and minimises the heat released during digestion.” High-quality forage and fibre also help optimise rumen efficiency and function, particularly for animals receiving high starch diets. If supplementary feeding, modify this strategy from once to twice-a-day feeding, and consider feeding less during the hotter hours and more at night, to allow heat dissipation⁶. It can also be beneficial to balance the mineral and electrolyte content, because excessive sweating or panting results in losses of sodium, potassium and bicarbonate, increasing the risks of acidosis and mineral imbalances. As Dr Gonzalez-Rivas concludes, “a proactive approach to the management of heat stress is more effective than a reactive response once it has occurred. Right now, is a great time to begin implementing the best processes to minimise the impact of what’s set to be another blisteringly hot Australian summer and I encourage all farmers and producers to register to our free webinars.” Get your livestock performance ready for summer. Sign up for the heat load index forecast, and heat stress alerts for beef cattle at chlt.com.au and for dairy cattle at dairy.katestone.com.au For more information and to register to the free webinars run by Virbac Australia, visit au.virbac.com/webinars Beef webinar: Thursday 31st October at 6.30pm-7.30pm AEDT Dairy webinar: Thursday 5th December at 6.30pm-7.30pm AEDT Ends MEDIA CONTACT Kate Munsie - C7EVEN COMMUNICATIONS (02) 6766 4513 kate.munsie@c7even.com.au Photo captions: Dr Paula Gonzalez-Rivas during a cattle trial Beef cattle in Northern Australia [1] David Wolfenson, Zvi Roth, Impact of heat stress on cow reproduction and fertility, *Animal Frontiers*, Volume 9, Issue 1, January 2019, Pages 32–38, <https://doi.org/10.1093/af/vfy027> 2 Fabris, T. F., Laporta, J., Skibieli, A. L., Corra, F. N., Senn, B. D., Wohlgemuth, S. E., & Dahl, G. E. (2019). 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Oikonomou, G., Lima, S. F., Bicalho, M. L. S., Kacar, C., Foditsch, C., ... & Bicalho, R. C. (2014). The effect of injectable trace minerals (selenium, copper, zinc, and manganese) on peripheral blood leukocyte activity and serum superoxide dismutase activity of lactating Holstein cows. *The Veterinary Journal*, 200(2), 299-304. 4 Teixeira, A. G. V., Lima, F. S., Bicalho, M. L. S., Kussler, A., Lima, S. F., Felipe, M. J., & Bicalho, R. C. (2014). Effect of an injectable trace mineral supplement containing selenium, copper, zinc, and manganese on immunity, health, and growth of dairy calves. *Journal of dairy science*, 97(7), 4216-4226. 5 Gonzalez-Rivas, P. A., DiGiacomo, K., Russo, V. M., Leury, B. J., Cottrell, J. J., & Dunshea, F. R. (2016). Feeding slowly fermentable grains has the potential to ameliorate heat stress in grain-fed wethers. *Journal of animal science*, 94(7), 2981-2991. 6 Mader, T. L., Davis, M. S., & Brown-Brandl, T. (2006). Environmental factors influencing heat stress in feedlot cattle. *Journal of Animal Science*, 84(3), 712-719.

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