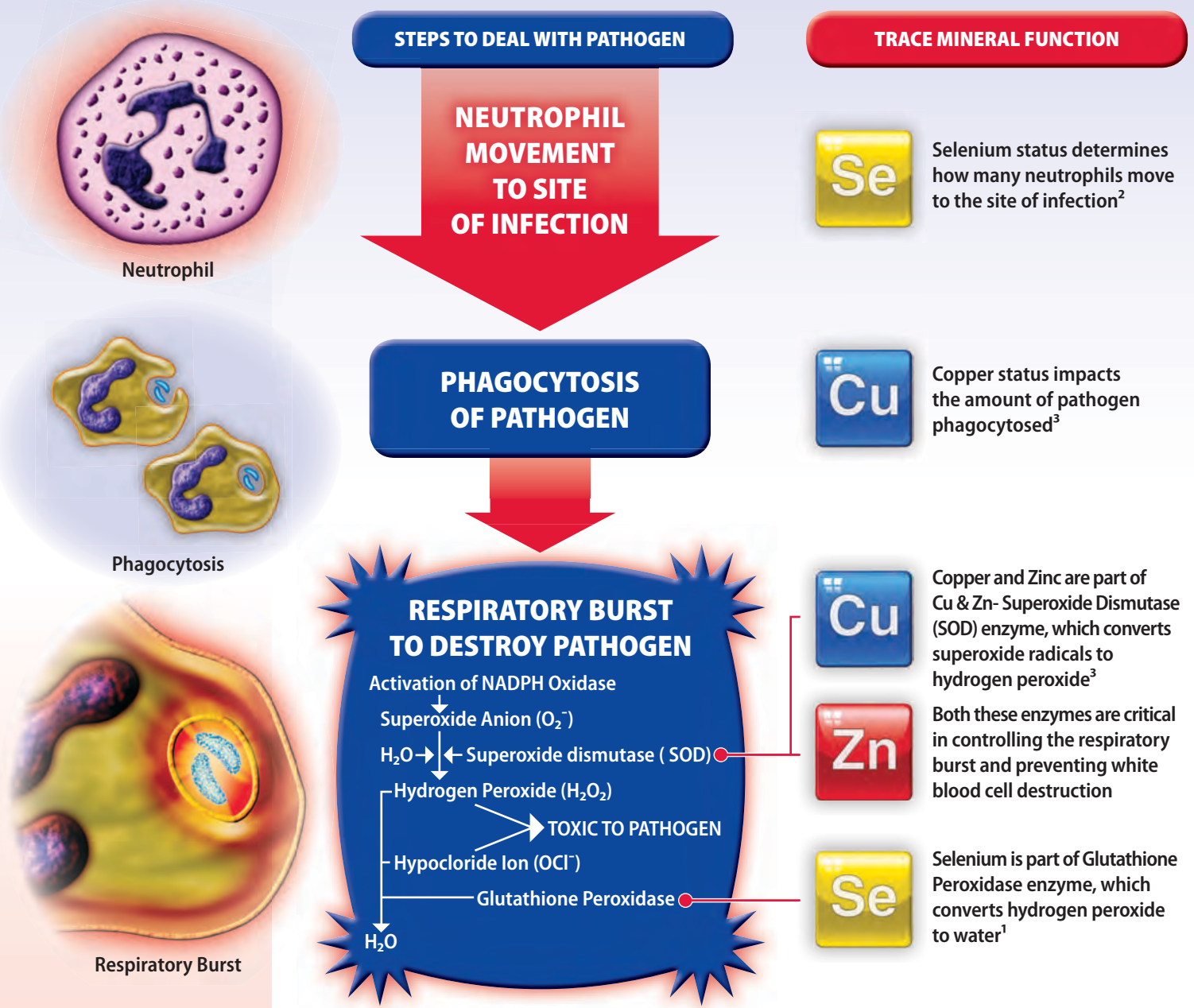




Trace Minerals and the Innate Immune Response

Neutrophil and Macrophage Driven Response to Pathogens

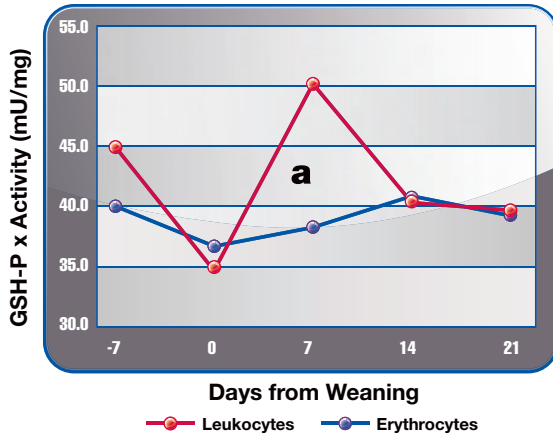


References:

1. Shank A. M. M., Effects of Stress on Several Immune and Health Responses of Weanling Calves. Thesis: Masters of Science in Veterinary Medicine. 2002. Virginia Polytechnic Institute and State University.
2. Maddox J.F. et al: Increased neutrophil adherence and adhesion molecule mRNA expression in endothelial cells during selenium deficiency. Leukocyte Biology. Vol 65. 1999.
3. Xin Z. et al: Effects of copper status on neutrophil function, superoxide dismutase and copper distribution in steers. J. Dairy Sci. vol 74. 1991.

Trace Mineral and Enzyme Changes at Weaning

Leukocyte and Erythrocyte Peroxidase Activity in Weaned Calves¹

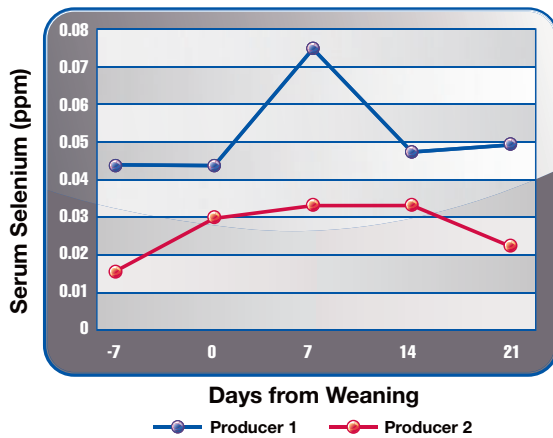


a – indicates significant difference ($P < 0.0001$) between means within a day

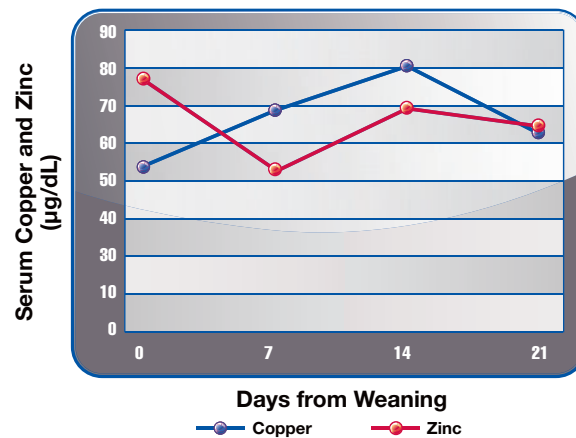
Each value is the mean of $n = 64$ observations



Serum Selenium (ppm)¹

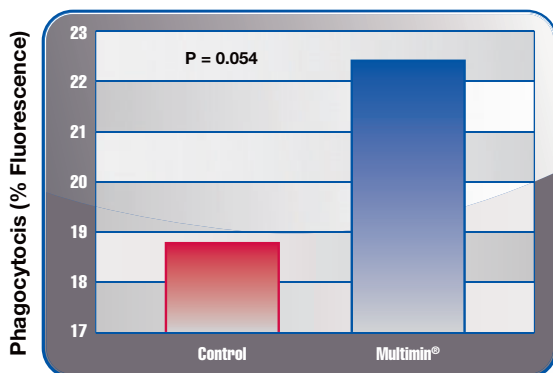


Serum Copper and Zinc ($\mu\text{g/dL}$)¹



Multimin[®] Application Prior to Weaning

Neutrophil Phagocytosis Activity¹



- Can be administered from day old (or within the first week of life)
- Can be repeated at 2 months of age and again prior to weaning
- Dosage rate: 1ml/100lb bodyweight
- Can be administered subcutaneous (BQA) or intramuscularly
- Supplies the Selenium, Copper and Zinc required for immune function and growth
- Manages any suppression/variation of feed intake
- By-passes antagonists which can tie up orally supplied minerals
- Proven to contribute to Neutrophil phagocytosis

So What?

Use **MULTIMIN[®]** prior to weaning, to ensure optimal white blood cell function at weaning!



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