

# Fever: Systemic Response to Inflammation



## Availa®Zn Impacts Inflammation-Related Rectal Temperature Response

Fever is part of the body's natural response to inflammatory stimuli when infection occurs. Upon pathogen recognition, sentinel cells, such as macrophages, secrete IL-1, IL-6 and TNF- $\alpha$  that trigger changes in body temperature. Fever enhances some components of the immune system:

- Neutrophil migration and chemotaxis
- Dendritic cell maturation
- Lymphocyte circulation
- Promotion of IL-2 secretion
- Survival of T-cells by inhibition of apoptosis (programmed cell death)

In a recent study, *Salmonella* Typhimurium LPS inoculum or saline was administered to layers. Cytokine concentration, IL-1 $\beta$ , was greatest at 3 h and lowest at 12 h for birds fed zinc from Availa-Zn. Subsequently, rectal temperature peaked earlier and returned to an inflammatory neutral state more rapidly (Figure 1).

In another study, beef calves were challenged with *infectious bovine rhinotracheitis* virus. In response to infection, calves receiving ZINPRO® zinc methionine and MANPRO® manganese methionine exhibited a more efficient immune response. Changes in fever response returned to baseline more rapidly (Figure 2), DMI intake change was minimized and subsequent body weights remained higher during the inflammatory process.

Figure 1. Effect of Availa-Zn on Interleukin-1 $\beta$  Response to *Salmonella* Typhimurium LPS Injection in Layers

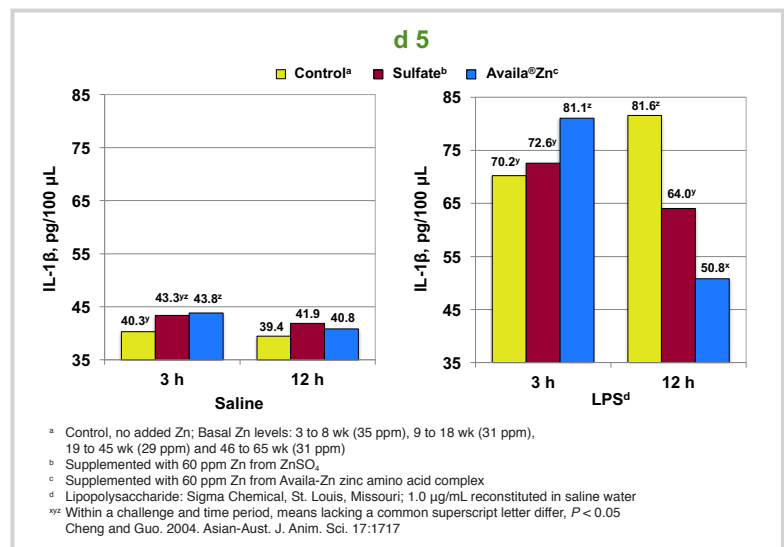
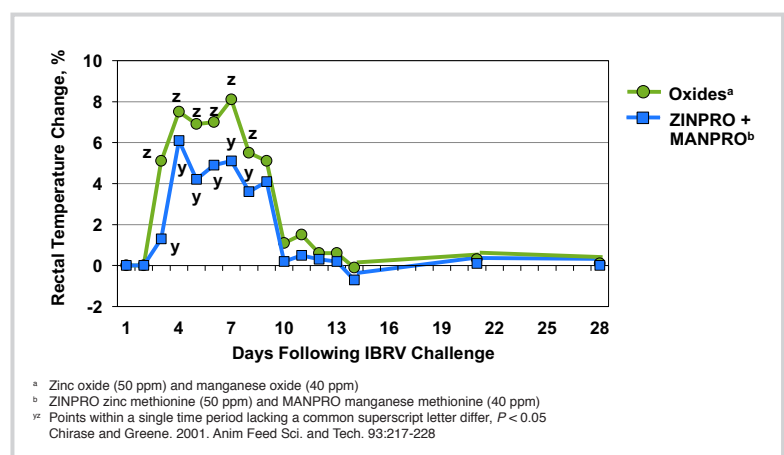


Figure 2. Effect of ZINPRO® and MANPRO® on Immune Response to IBRV Challenge



### CONCLUSIONS

By providing zinc from Availa-Zn, the fever response process is initiated more rapidly and fever subsides sooner. This illustrates a more efficient immune response that minimizes the energy expenditure associated with systemic infection.



Performance Trace Minerals Can Help You Manage Inflammation