



## Achieving Higher Antioxidant Status During the Dry Period and Transition Period Updates to Dairy CRYSTALYX® Formulas

A lowering of the somatic cell count (SCC) limit to 400,000 from the current level of 750,000 has been recommended by various Dairy industry groups and will be implemented nationally in the near future. This lowering of the SCC limit brings United States milk quality standards in line with international standards and ensures that US dairy products will remain competitive in export markets. SCC is an indication of the level of mastitis infections in a dairy herd. The USDA estimates that over 25% of milk shipments in 2009 would have exceeded the 400,000 SCC limit. Seasonally, summer months have the greatest risk of unacceptably high SCC due to increased stress levels associated with extended periods of heat.

Dairy producers and dairy nutritionists understand the importance of proper vitamin and mineral nutrition during both the dry period and the transition period. However, they often underestimate the role that key antioxidant nutrients play in immune function and their long term impact on uterine and udder health. A large amount of research has shown the importance of adequate levels of the antioxidant minerals, copper, zinc and selenium as well as adequate Vitamins A and E in preventing new mastitis infections during the dry and transition period.

These specific nutrients are required for antibody production and phagocytosis; the process of engulfing and killing pathogens that use reactive oxygen molecules such as hydrogen peroxide and superoxide. These reactive oxygen molecules are often called "free radicals" since they not only kill the pathogen, but most often damage surrounding tissue as well. In relation to mastitis, this tissue damage is responsible for the inflammation observed during clinical mastitis.

Antioxidants, is a collective term used to describe nutrients needed to turn tissue damaging free radicals into harmless water after the pathogens have been eliminated. Copper, zinc, and selenium are required in several major detoxifying enzyme systems while Vitamins A and E work within the cell membrane to detoxify free radicals. Economically, it makes the most sense to deliver these nutrients in highly bioavailable forms when cows have the greatest demand due to physiological and environmental stresses.

Research has shown increased concentration and activity of selenium containing enzymes in milk from dairy cattle fed organic selenium, with several trials documenting a lowering of SCC. Research conducted at the University of Kentucky showed that supplementing the dry cow with organic selenium resulted in improved cow response to vaccination; improve colostrum quality and greater antibody transfer to the calf. Dry Cow Formula™ often is the primary supplement for dry cows and will have 100% of the selenium from organic sources. Transition Stress Formula™ and Close-Up Dry Cow Formula™ often provide a TMR Safety Net™ and will have 50% of selenium from organic sources. Proper supplementation enables the cow's immune system to eliminate the mastitis infection quickly while minimizing the associated inflammation.

Areas of focus for any mastitis control program are both the dry and transition periods. The majority of new mastitis infections will occur during these production phases. Keeping SCC counts low during the warmer months of the year will be an area that will receive more attention. CRYSTALYX® Dry Cow™ Formula, Close-Up™ Formula and Transition Stress™ Formula have been utilized as a tool to deliver these key nutrients in a self-fed supplement. The addition of organic selenium to these formulas can help dairy producers and nutritionist meet the challenge of staying under the 400,000 SCC limit.