

Remember, nutrition can impact udder health and SCC too

R. Tom Bass for *Progressive Dairyman*

Maintaining good udder health and low bulk tank somatic cell counts (SCC) is increasingly important to dairy profitability, particularly in light of the recent marketing requirement adopted by most milk processors to limit bulk tank SCC to a maximum of 400,000 cells per ml. Compliance with this new standard generally means that dairies must implement consistent and correct practices in a number of areas. A focus on clean cows, dry environments, proper udder prep and milking machine function, along with prudent monitoring, treatment and culling decisions, is commonly emphasized by herds with perennially low SCC.

Ultimately, successful dairies do a good job of consistently keeping their cows' exposure to mastitis

pathogens low and their immunity high. The intent of this article is to discuss some nutritional strategies and feed additives that can be utilized to better maintain or enhance immune function and, thereby, reduce a cow's susceptibility to mastitis. However, recognize that on most dairies, most days, these considerations are likely of secondary importance to management, environmental and/or cow factors when prioritizing opportunities to improve udder health and lower SCC.

Maintain transition cow health

Herds with high percentages of healthy fresh cows focus on management-related and nutrition-related strategies that encourage healthy appetites and consistent dry matter intake through the transition

period (both pre-fresh and post-fresh). Numerous studies have shown that cows that consume more dry matter before and after calving have fewer metabolic and infectious problems after calving. Important considerations include proper dry and fresh cow management (adequate feedbunk space, minimal group/social changes and good cow comfort), as well as a controlled energy formulation strategy for dry cow rations.

Negative energy balance is detrimental to immune function in dairy cows. Clinical and subclinical ketosis can increase the risk of elevated SCC, as well as clinical mastitis. Calcium metabolism also plays roles in immune function, both through its involvement in muscle contraction (reducing the risk of pathogen entry

into the udder via proper teat sphincter function) and roles in immune cell activation and response. The risks associated with these metabolic diseases are significant. Cows with ketosis may be twice as likely, and cows with milk fever potentially eight times more likely, to get mastitis, as compared to fresh cows without these metabolic disorders.

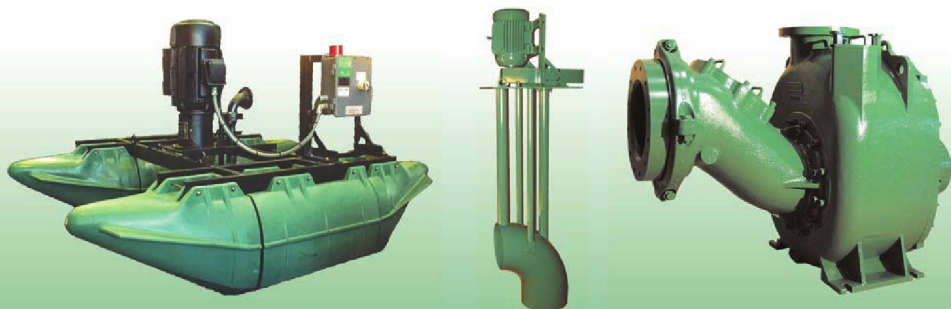
Vitamins and trace minerals

Several vitamins and trace minerals play key roles in immune function, most notably vitamins A and E, zinc (Zn), selenium (Se) and copper (Cu). Numerous studies involving chelated/complexed (organic) forms of Zn from several manufacturers have reported statistical or numerical improvements in SCC. One company, across 12 research trials, reports an average reduction in bulk tank SCC of 98,000 cells per ml in association with the use of their chelated Zn product.

An abundance of research data supports improved udder health in association with vitamin E and/or Se supplementation. Studies reporting the most positive results typically had control groups where a deficiency of one or both of these micronutrients was present. For example, in an often-cited Ohio trial where close-up dry cows fed 4,000 IU of supplemental vitamin E per day experienced less clinical mastitis after freshening, it should be remembered that cows were fed rations that only contained 0.1 ppm supplemental Se. The magnitude of the treatment response may not have been as great in Se-adequate cows.

Most U.S. dairies are meeting NRC recommendations for supplemental Se and dietary vitamin E provision. Given these circumstances, simply increasing the amount of vitamin E and/or Se fed by no means guarantees an improvement in udder health or herd SCC. In fact, a recent field trial in Ohio found equivalent mammary infection rates in cows fed 1,000 IU per day and 5,000 IU per day

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of vitamin E. Furthermore, it should also be remembered that the FDA-imposed legal limit on supplemental Se provision is 0.3 ppm of ration dry matter. Organic Se (Se-yeast) may be of some value when Se antagonists are present in the ration, and it consistently raises blood and milk Se concentrations when fed, but it has shown no benefit to lowering SCC in controlled research studies.

Ration additives that may enhance immune function

A growing body of research evidence has developed in recent years in support of the ability of yeast-derived glucans and mannans to enhance immune function in several species, including cattle. At least two business entities have data from controlled research and field trials indicating lower SCC in association with feeding a product containing these ingredients.

In particular, one company has an extensive, multi-year collection of field trial data that is ongoing. As of the fall of 2010, over 250 dairy herds encompassing almost 160,000 lactating cows had trialed a proprietary product containing yeast extract and other ingredients, with the majority (but not all) of participating herds reporting a reduction in SCC after feeding the product for 90 days. Average SCC reduction for all the participating herds was 47,000 cells per ml, but herds with an initial SCC of greater than 351,000 cells per ml reported an average reduction of 103,000 cells per ml at the end of the three-month trial period. Please note that these field trials are not case-controlled research studies and, as such, are subject to more bias and confounding of data. However, the sheer number of herds involved should facilitate some consideration of the potential value

and legitimacy of the results reported.

What about mycotoxins?

Can mycotoxins directly cause clinical mastitis or increase SCC? Not to the author's knowledge. However some mycotoxins can certainly reduce immune function and that, in turn, can increase the risk of mastitis and other infectious diseases. Mycotoxins may well be a legitimate risk factor for some herds struggling with high SCCs, but remember that it's still ultimately bacteria that cause mastitis and/or elevate bulk tank SCC. Try to reduce the herd's consumption of mycotoxins,

but don't forget to also take a broader view of the situation and see what other opportunities exist to address the challenge from a different angle.

Conclusion

Achieving and maintaining good udder health requires proper and consistent implementation of several management-related, environment-related, cow-related and nutrition-related factors. Implement a dry cow management and nutrition program that encourages good dry matter intake and minimizes problems with calcium metabolism and metabolic

diseases in fresh cows. Try to eliminate, or at least minimize, the stressors cows are potentially exposed to throughout their production cycle. Formulate rumen-friendly diets and utilize ration additives with the primary focus of maintaining or improving immune function. Lastly, view nutritional considerations as a supportive strategy, rather than the total intervention program, in the ongoing quest for better udder health and milk quality. **PD**

Bass is a veterinarian with 15 years of experience in dairy nutrition.



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