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Supporting Immune System Promotes Healthy, Productive Dairy Cattle

By David Kirk, Ph.D., P.A.S.

Healthy cows are more productive and profitable. Dairy cattle face various stress factors throughout the lactation cycle that can suppress their immune system, putting them at greater risk for health disorders, as well as reduced milk production and lower milk quality. Research demonstrates proper nutrition promotes year-round herd health by supporting normal immune function.

Certain events produce visible signs of stress, such as calving, high levels of environmental pathogens, weather changes and challenges with forage and feed quality. Other factors, such as production demands, cow comfort, air quality and water availability, can produce more subtle signs of immunological stress. All of these can challenge the cow's immune system, leading to health issues that have a significant financial impact on a dairy. Sound management and nutritional strategies can minimize the occurrence of disease by maintaining a healthy immune system, which is often far more cost-effective than treatment.

Whether related to environment or management, stress produces a surge in the hormone cortisol, which can weaken the dairy cow's immune system and reduce its ability to fight infections. This can lead to an increase in profit-stealing diseases, such as mastitis, metritis, ketosis and displaced abomasums, resulting in more health treatments, lower milk production, higher somatic cell count (SCC) and unplanned culls. Calves can also suffer from impaired immune function, because their immune system is poorly developed during the first few weeks of life.

Research shows that a healthy immune system is vital in protecting against stress factors that can make dairy animals more susceptible to health issues.

Wisconsin dairy adopts nutritional strategy

Heeg Brothers Dairy LLC, located in Colby, Wis., is a 1,000-cow dairy operation that also includes 2,300 acres of corn silage and alfalfa. Partner Jay Heeg, who co-owns the dairy with his brothers, Mark and Gary, said they began experiencing an increase in feed-related health problems about two years

ago. “It seemed like we were always having cows in the sick pen,” he recalled. “We have high-producing dairy cows, and any bit of stress can throw them off.”

Based on the recommendation of their nutritionist, they began adding *OmniGen-AF*[®] to their dairy rations, a unique patented nutritional specialty product, from Prince Agri Products, Inc., which has been demonstrated to help support immune function in dairy cattle. The supplement is currently being fed year-round to all of Heeg Brothers Dairy’s dry, pre-fresh and lactating cows. “I just feel like supporting immune function has really helped our cow health and performance,” Heeg said. “We have very few cows in the sick pen now.”

Heeg noted that, in addition to better health, improving the nutritional program and overall management practices have helped the dairy maintain a high production level – 88 pounds of milk per cow, per day – and also resulted in a reduction in somatic cell count dropping from the 160,000-180,000 SCC/ml range to 120,000, and even below 100,000 for a period of several months.

Changes in somatic cell count are generally an indication of a change in mammary gland health. SCC below 150,000 may be indicative of proper sanitation and milking parlor practices, good cow comfort and low pathogen exposure. Alterations in any of these can lead to fluctuations in SCC or even chronically elevated counts.¹

Heeg believes that supporting immune function through nutrition has been particularly beneficial in enabling his cows to better cope with the stress of calving. “It helps with the overall health of our fresh cows, getting them up and going and off to a good start,” he said.

To minimize stress, Heeg Brothers Dairy also focuses on promoting cow comfort, including the use of sand-bedded free stalls, fans and misters to keep cows cool and comfortable in the summer.

South Dakota dairy sees more consistent nutrition

MoDak Dairy in Goodwin, S.D., started adding *OmniGen-AF* to its rations several years ago in response to changes in feed sources and accompanying feed quality that negatively affected dairy cow health. “If there’s a health issue, we want to stay ahead of it,” said Greg Moes, co-owner of the 2,000-cow dairy.

Helping to support immune function in combination with other management practices has helped to increase the operation’s herd health, resulting in fewer health disorders and 10 to 15 pounds more milk production per cow, per day. “The more consistent you can keep an animal with intakes, the more you can have higher-producing animals,” Moes said.

Focus on prevention

Prevention is in the best interest of dairy producers and their animals, and preventing health problems starts with good nutrition, reduced stress and a properly functioning immune system. Ongoing research continues to show that proper management and good nutrition can help reduce the occurrence of disease in the herd, resulting in lower treatment costs and increased profitability.

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Research Supports Benefits of Supporting Dairy Cattle Immune Function

The health benefits that Heeg Brothers Dairy and MoDak Dairy have experienced through their attention to nutrition and management practices are consistent with recent research that also reinforces the importance of a well-functioning immune system. For example, several studies presented at the 2013 American Dairy Science Association-American Society of Animal Science Joint Annual Meeting earlier this year illustrated the positive impact of *OmniGen-AF* in helping to support the cow's natural immune system against multiple sources of year-round stress.

Research findings included:

- A heat stress study at the University of Arizona, using cows housed in environmentally controlled modules, indicated animals receiving the nutritional specialty product had significantly greater dry matter intake, less water consumption, reduced respiration rates and lower rectal temperatures during heat stress than control cows.
- Mature Holsteins, fed the specialty product from dry-off through 30 days in milk, at an 8,000-cow dairy, had statistically higher first test day, 4-week and peak milk yields than cows that did not receive the supplement.
- Jersey calves receiving *OmniGen-AF* from one to 90 or one to 160 days of age had improved growth and health, with reduced medication costs, compared with non-supplemented calves.
- Researchers at Texas Tech University found neutrophils (white blood cells that provide early protection against infections) obtained at calving from cows fed the supplement beginning at dry-off had higher L-selectin content, but lower oxidative burst intensity in response to *E. coli*, and lower plasma haptoglobin concentration at 14 days after calving, versus control cows. These

findings suggest that the nutritional specialty product helped improve health status of cows during the transition period.

Access to the full abstracts is available by visiting <http://jtmgtg.org/2013/abstracts.asp> or by calling 1-800-6-PRINCE.

¹ Large Dairy Herd Management 1992. H.H. Van Horn & C. J. Wilcox. Chapter 49, Monitoring Milk Quality and Udder Health. Pg. 475-488. Printing and distribution arranged for by: Management Services American Dairy Science Association, Champaign, IL 61820.