

Health and Welfare

Research presented on mitigating BRD, heat stress and acidosis.

by **KASEY BROWN**, senior associate editor & **TROY SMITH**, field editor

Cattle health and welfare go hand in hand, and speakers at the fifth International Symposium on Beef Cattle Welfare (ISBCW) June 8-10 in Manhattan, Kan., spoke on new ways to handle health issues with regard to welfare.

Novel interventions for BRD

There is ample evidence suggesting that supplementing cattle diets with yeast can benefit the rumen microbial community, but Jeff Carroll thinks the benefits may go far beyond enhancement of digestion. Based at the USDA Agricultural Research Service (ARS) Livestock Issues Research Unit in Lubbock, Texas, Carroll studies how the physiological and behavioral responses to stress impact the immune function of food animals. He believes yeast, when added to cattle diets, holds much promise for mitigating the effects of certain stressors and improving cattle health.

More specifically, Carroll's findings suggest that feeding live yeast strains and yeast cell-wall products may be a viable way to battle bovine respiratory disease (BRD).

Carroll noted that BRD remains as the leading cause of morbidity and mortality in U.S. feedlots, representing an average cost of \$23.60 per head for treatment. Tools for treating BRD are limited, he added, calling antibiotic therapy the primary strategy.

"The future use of antibiotics is unsure, and alternatives must be explored," stated Carroll, alluding to growing scrutiny of antibiotics used by animal agriculture.

Carroll said experiments at Lubbock were designed to determine the effects of yeast supplementation on immune response and metabolism of cattle facing a challenge from viral-bacterial agents associated with BRD. Results indicated that, compared to a control group, yeast-supplemented cattle experienced reduced need to call upon metabolic-energy resources typically associated with immune response. Yeast-supplemented cattle tended to have decreased inflammatory response to disease challenge and levels of blood neutrophils (white cells summoned to combat inflammation) were lower. Yeast supplementation also reduced the severity of nasal lesions associated with respiratory infection.

"Collectively, this data suggests that providing a combination of live yeast and yeast cell-wall products may be beneficial in reducing severity of bovine respiratory disease in feedlot cattle," stated Carroll.

Additionally, the study showed that water consumption among yeast-supplemented cattle increased after the

disease challenge. Frequency of visits to water and total intake both were increased — behaviors aiding mitigation of higher temperatures.

"We may be onto some supplementation strategies that could increase heat resistance," opined Carroll. "There may be a ton of things yeast products can do, but we need more research."

— by Troy Smith

New mitigation option for heat stress

Heat mitigation is an increasingly important issue, and there are several strategies at cattlemen's disposal, especially in the feedlot. Shade, ration changes, changing feeding times, spraying or misting, and improving water availability are all tools within the toolbox, but morbidity and mortality continue to be a significant issue in U.S. feedlots. Heat stress has cost the industry at least \$369 million, said Carroll.

The ARS researcher shared that previous research indicated supplementing yeast products during a period of naturally occurring heat stress improved feed intake and gain without jeopardizing the health of the cattle. It also enhanced overall health status and showed a greater resistance to an endotoxin challenge after the heat event.

Carroll shared a recent study from his research team evaluating whether supplementing the diet of near-finished beef cattle with a yeast product would mitigate the negative impact of a controlled heat stress event on physiological and endocrine responses.

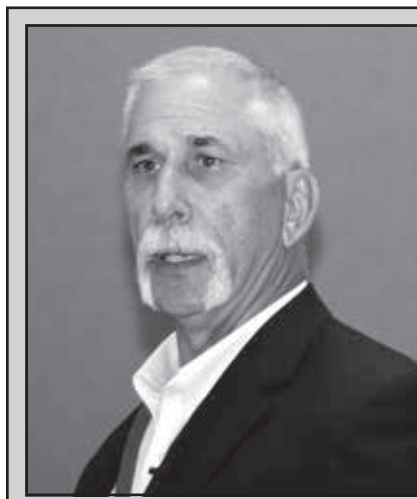
Beef heifers were

supplemented with a live yeast and a yeast cell-wall product for 50 days, which Carroll said was a normal receiving situation. Thirty-two head were transported to the USDA Bovine Immunology Research and Development Complex, in which humidity and temperature could be controlled. The diet was steam-flaked corn, and the supplemented group received a top dressing of the yeast supplement.

A heat event was created to simulate what feedlot cattle have to deal with, especially when it doesn't get cool enough at night to fully recover.

Carroll admitted that the data set was small, but he shared that the yeast-supplemented cattle had a consistently lower vaginal temperature during the heat-stress event, though they consumed much more water. They exhibited lower respiratory rates during the heat-stress event. They also lost 6.34 pounds (lb.) less than the control-group animals.

Additionally, supplemented cattle had lower cortisol levels over time, and he noted that they acclimated well in



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stress hormone response. There were no significant changes in glucose levels or nonesterified fatty acid (NEFA) concentrations.

More research will be useful, but Carroll said the majority of the data would indicate that supplementation with live yeast and a yeast cell-wall product to feedlot heifers may mitigate some of the negative effects associated with heat stress.

— by Kasey Brown

Rumen acidosis

Rumen acidosis is a malady that many cattle-savvy people associate with grain overload. Acidosis is the likely outcome when a large quantity of grain is introduced to an unadapted ruminant digestive system. However, it can occur in animals grazing forages only, provided the forages contain highly soluble carbohydrates.

According to veterinarian and researcher Kelly Lechtenberg, acidosis

can result from excessive ingestion of any feeds rich in fermentable components. While even grazing cattle can be affected, the owner of Midwest Veterinary Services and Central States Research Centre at Oakland, Neb., said acidosis is more often a feedlot issue.

Lechtenberg said acidosis occurs when rumen pH declines from the normal range of 6.5-7 to below 5.8. Acute acidosis typically results from an abrupt increase in an animal's intake of feedstuffs that can be rapidly fermented by rumen microbes. This increases lactic-acid production and accumulation in the rumen. The low pH environment favors an increase in acid-producing microbes and the further production of lactic acid exceeds the rate at which it can be removed from the digestive tract.

This leads to increased endotoxin production; decreased blood and urine pH; and multiple secondary effects, including lethargy, anorexia and laminitis.

"And there's the diarrhea. Bubbly diarrhea is a symptom of classic acidosis," added Lechtenberg, explaining that the excrement bubbles because it contains still-fermenting rumen substrate.

In addition to lameness of gait, indications that animals are in pain may include the inability to find a comfortable standing position and grinding of teeth. Lechtenberg says animals often become lame within 24 hours of acidosis onset, but usually respond to analgesic therapy.

"We used to think managing acidosis was all about adapting the digestive system by stepping up cattle rations at the start of the finishing period," said Lechtenberg, explaining how cattle are shifted from rations containing mostly roughage to those containing more concentrates. "But adaptation may have to happen more than once — even near the end of the finishing period. It happens after any disruption to normal feeding patterns and consumption levels."

Lechtenberg said management to lessen the risk of acidosis includes providing ample bunk space, pen maintenance and providing easy access to ample supplies of drinking water. A consistent feeding schedule, heat stress mitigation and low-stress cattle handling also help control external stimuli that affect cattle feed intake. The goal, said Lechtenberg, should be to manage the environment in ways that foster frequent small meals and prevent opportunities for hungry cattle to "load up" on feed.

— by Troy Smith



Editor's Note: Troy Smith is a cattleman and freelance writer from Sargent, Neb. Watch for additional coverage of the 2016 ISBCW on www.angus.media and in the *Angus Journal* and *Angus Beef Bulletin*. Comprehensive meeting coverage will be archived at www.api-virtualibrary.com/meetings_other_news.html.