

HEART MURMURS



Researchers, Angus Foundation seek insight into matters of the bovine heart.

Story & photo by Miranda Reiman, senior associate editor

The most common causes of feedyard mortalities often get the most attention from cattle producers and researchers alike. Bovine respiratory disease (BRD) accounts for 43% of all cattle deaths in the feedyard, with gastrointestinal issues making up another 19%. In comparison, a disease that makes up 4% of feedyard mortalities may seem insignificant.

However, that 4% matters if you're a producer whose cattle succumb to bovine congestive heart failure (BCHF). They want to know why and how to prevent it, says Blaine Johnson, a researcher with the Kansas State University (K-State) Beef Cattle Institute (BCI). He and his team are working to understand more.

What is BCHF?

At its simplest, BCHF is just as it sounds, Johnson says — a noninfectious form of heart disease that, as it progresses, eventually causes the heart to stop. Chronic high blood pressure damages tissues.

“When an animal experiences pulmonary hypertension for a long time, both within the lung and particularly the pulmonary artery that goes from the right side of the heart to the lung, then those tissues become inflamed and they lose their elasticity,” says Milt Thomas, Colorado State University (CSU) animal scientist, who is also studying the disease.

That makes the heart work harder and under higher pressure, because the organ is no longer as flexible.

“It becomes like a garden hose,” Thomas says.

CSU developed a 1-to-5 heart-scoring system to rank severity

from animal to animal and assign some objective measures to ongoing research (see page 110).

“Heart disease is not a new disease,” Johnson says.

High-altitude disease (HAD), a form of congestive heart failure experienced when animals are stressed by lower oxygen levels, was first noted by CSU veterinarians in 1914.

“For high altitude it's been documented and researched for over 100 years,” Johnson explains. “Then we started seeing it in lower-level elevations.”

High-altitude disease is generally classified as being at elevations of 5,500 feet or above. Lower than that, and the cause is still somewhat unknown. Scientists suspect it has to do with some form of hypoxia.

“The first thing we noticed is that there's a large variation in what yards are actually calling heart disease.”

— Blaine Johnson

How common is it?

Today, BCHF claims around 0.07% of all feedyard cattle. It may affect as many as 15 in 10,000 cattle when those figures are added to the number of cattle sold early due to lack of performance.

“We found that we're actually railing cattle at a higher rate than we are seeing cattle die of heart disease in the feedlot,” says Johnson.

Those numbers are slightly higher than what they expected based on previous research, but he says he wonders: “Is this real, or is this something that we're looking harder for?”

Those statistics are from a recent K-State analysis of health data on 4.5 million head of cattle fed across the United States. The research, supported in part by the Angus Foundation, quantified the incidence of BCHF across the industry and sought to identify patterns in the data.

“We were just trying to find answers,” says Kelli Retallick-Riley, president of Angus Genetics Inc. (AGI).

“At the beginning of this conversation, when we have these cattle popping up and dying of congestive heart failure at very low elevations, it raised a lot of questions. There were a lot of anecdotal thoughts out there about what types of cattle were succumbing to this disease, what

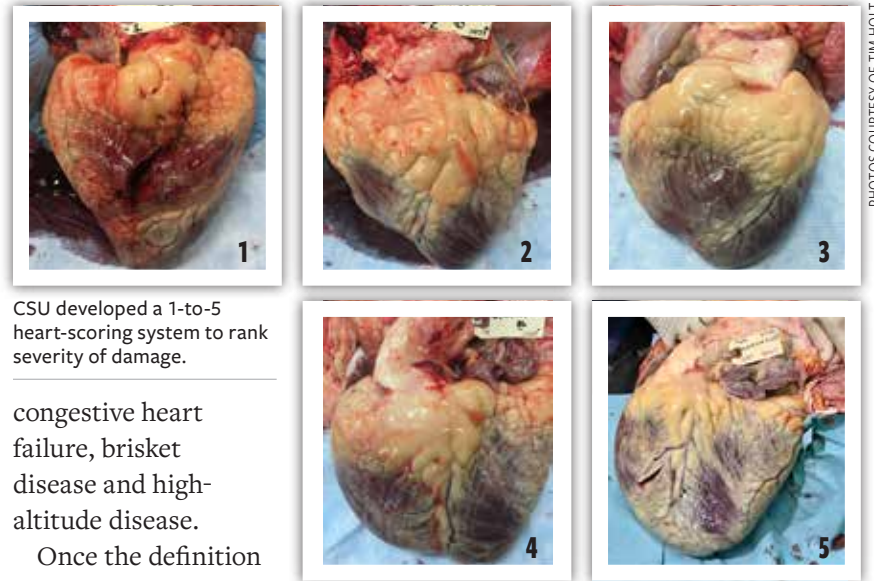
age they were, how far along they were on their days on feed, what types of cattle. We had a lot of assumptions, but we didn't have a lot of data.”

They did have a lack in a universal definition and consistent data reporting, says Brad White, BCI director and fellow researcher.

“The first thing we noticed is that there's a large variation in what yards are actually calling heart disease,” Johnson says.

He pooled data from more than a dozen different labels, including

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Fig. 1: CSU heart-scoring system, where 1 represents an undamaged heart and 5 represents a severely damaged heart

PHOTOS COURTESY OF TIM HOLT

CSU developed a 1-to-5 heart-scoring system to rank severity of damage.

congestive heart failure, brisket disease and high-altitude disease.

Once the definition is consistent, the next hurdle is correct diagnosis, because it's not that common, it mimics other diseases and a cattleman never knows for sure unless there's a necropsy. Common BCHF symptoms, such as labored breathing and general failure to thrive, could also indicate bovine respiratory disease (BRD) or acute interstitial pneumonia (AIP).

Across all the yards, occurrences varied a great deal, with some locations declaring zero cases and others 15 in 10,000. That suggests a difference in reporting, Johnson says.

Mythbusting

Digging into the data, they looked for clues that would point to a specific type of cattle most commonly affected. They analyzed the information for arrival weight, gender, time of year and other factors.

"Some of the things that we've heard early on — and those would make sense that they could play a factor in when we see heart disease — when we go back and we look at the data across multiple yards and multiple years, we don't see that those are having a big impact on their risk of heart disease," White says.

The idea that it's only a challenge late in the feeding period is not congruent with their timing analysis, Johnson adds.

"It wasn't just localized to one period. It was throughout the whole feeding period," he says. "So it kind of went against some of the anecdotal things we would hear out in the industry buzz."

Johnson is currently working on a second paper for publication, which includes a few more years of data and also notes that BCHF is found in native beef animals and dairy animals in similar fashions. It points out that it is not specifically an Angus problem.

"Angus is 75% to 80% of the cattle on feed, so that's not a fair statement in my books. They're just the biggest part of the animals we see on feed," Johnson says.

All the research may add up to a genetic tool or management recommendations in the future.

"This is kind of the foundational groundwork we need for us to try to go out and say, 'OK, what do we do next?'" Retallick-Riley says.

Learning more about the disease, both how it works biologically and its epidemiology, will allow for future work to help producers do something more about it. ■

Editor's note: To read more about BCHF and the work the American Angus Association is doing, see "Healthy Hearts Start with Knowing More," in the August 2022 *Angus Journal*, read the summary of Thomas's presentation at the 2022 Beef Improvement Federation Annual Convention and Research Symposium in the Newsroom at www.BIFconference.com or view Thomas's entire presentation at <https://bit.ly/abbhearts>.