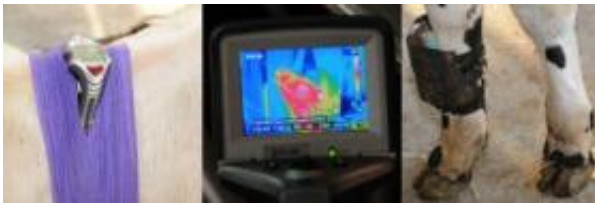


Veterinarians developing model to help producers, vets make cattle more comfortable

February 17 2009



A heart monitor, thermal imaging camera and an accelerometer helped Kansas State University researchers determine the level of comfort of cattle. Credit: K-State College of Veterinary Medicine

Using equipment not all that different from what a runner might take on a jog, veterinary researchers at Kansas State University are working to make life more comfortable for cattle.

A jogger's heart rate monitor and an instrument similar to a pedometer are a few of the tools K-State researchers are using to measure discomfort in cattle undergoing two routine procedures, castration and dehorning.

Hans Coetzee, assistant professor of clinical sciences, is working with David Anderson, professor of clinical sciences, and Brad White, assistant professor of clinical sciences. They are developing a model that can evaluate pain management drugs for cattle. Although producers and veterinarians sometimes use aspirin and other anti-inflammatory drugs,

there are no pharmaceuticals approved by the U.S. Food and Drug Administration specifically for pain management in cattle. It is also unknown what doses are appropriate and how well they work.

"Producers and veterinarians want to effectively treat and prevent pain in livestock, but because these drugs don't have approval from the Food and Drug Administration for cattle they are limited in what they can do," Coetzee said. "Our goal is to give producers the means to address consumers' concerns about the welfare of farm animals."

The researchers received a \$325,000 grant from the U.S. Department of Agriculture to develop a model to assess pain in cattle. Coetzee said ultimately this model will help the FDA evaluate drugs for cattle by knowing how well they work and to recommend proper dosing.

"Managing pain is an inherently good idea, but it is critical to put science behind it because cattle can not communicate their pain," Coetzee said.

The researchers are basing their model on two common practices, dehorning and castration. The frequency of these practices makes them useful to study. More important, Coetzee said these are routine livestock management procedures that the cattle are undergoing whether the researchers study them or not.

"We're studying common procedures, so we're not inflicting pain on the animal for the purpose of the experiment," he said. "Our goal is to improve the quality of life of the animals in our care without causing unnecessary discomfort."

The researchers took a variety of measurements. They used thermal imaging cameras to measure skin temperature. As cattle become stressed, blood moves toward the heart and brain, cooling the surface of the body.

To see how cattle are moving around, they attached an accelerometer to the legs. Similar to a walker's pedometer, the accelerometer measures the up and down movements of the leg. Coetzee said the researchers anticipated that the more uncomfortable cattle are, the less they would move around. In fact, they found the opposite to be true, as if the cattle want to "walk it off."

To measure heart rate, they attached a monitor like on a jogger might strap to his or her arm. To affix these monitors to the cattle's considerably larger midsections, the researchers wrapped the monitors to the animals with bandages.

The researchers borrowed an apparatus used by barrel racers to gauge speed as a way to measure how quickly cattle exited the chute. Their assumption was that the more uncomfortable the animal was, the faster it would leave. Although the experiment didn't accurately account for discomfort, it did tell the researchers other important data. How slowly cattle moved out of the chute indicated the effectiveness of sedatives, Coetzee said.

They also took blood samples to measure for levels of cortisol, which indicates stress level.

Each animal was its own control group, Coetzee said, which meant that all of these measurements were taken before and after the procedures. He said this was important because each animal had a unique stress level to begin with.

"We have some animals that are by nature a little more excitable than others," he said.

Coetzee presented the research at several conferences last fall and most recently in November 2008 for the FDA.

Another facet of the research is looking at the weight of cattle given pain relievers versus those who weren't. The researchers gave some of the cattle drinking water spiked with a pain-relieving drug. Coetzee said the animals with the spiked water maintained their weight after the procedures, whereas the untreated animals initially lost weight.

"We're finding that maybe there is some additional benefit to pain relief other than just the ethical considerations," he said.

Source: Kansas State University

Citation: Veterinarians developing model to help producers, vets make cattle more comfortable (2009, February 17) retrieved 2 May 2024 from <https://phys.org/news/2009-02-veterinarians-vets-cattle-comfortable.html>

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