AGRICULTURE

Delaware County Extension

August 2022

Agriculture News

Delaware County Free Fair Hay Show

Samples are due to the Extension Office

August 19th

Divisions Include:

- Square Bale
- Round Bale

Classes for each Division:

- Native
- Warm Season Introduced
- Cool Season Introduced
- Legume

Hay will be sent off for a Quality Test and be judged at the Fair.

- If entering Square Bale Division bring in a flake of the bale.
- If entering Round Bale Division bring in the equivalent of half a feed sack.

For Additional Information Contact the Extension Office

Delaware County Extension Office

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In this issue

Dropping Like Flies – Prussic Acid in Cattle

Rosslyn Biggs, DVM Beef Cattle Extension Specialist and Director of Continuing Education and
Barry Whitworth, DVM, Area Food/Animal Quality and Health Specialist for Eastern Oklahoma

As the year progresses many producers look to move cattle to alternative pasture. Unfortunately, certain weather conditions, including drought or freezing, can set up some plants in the sorghum family, including Johnson grass, to become toxic. Even after limited grazing, deaths may be seen due to the ingestion of prussic acid, also known as hydrocyanic acid or cyanide. A classic call to the veterinarian is, "My cattle are dropping like flies."

Prussic acid toxin is created when the harmless hydrocyanic glycosides in plants are stressed and breakdown. Once the hydrocyanic glycosides in the plants are damaged through actions like cattle chewing or a swather and crimper, they quickly convert to prussic acid. Following ingestion, the prussic acid is released in the rumen and rapidly absorbed into the blood stream.

Once in the circulatory system, the toxin prevents cells from taking up oxygen. The blood therefore becomes saturated with oxygen leading to blood that appears bright cherry red. The clinical signs most often seen include excitement, muscle tremors, increased respiration rate, excess salivation, staggering, convulsions, and collapse. Asphyxiation at the cellular level is the cause of death due to deprivation of oxygen.

When producers encounter animals displaying clinical signs of prussic acid toxicity, they should immediately remove all the animals that appear normal to a new pasture and contact their veterinarian. The veterinarian will treat the sick animals with two drugs (sodium nitrite and sodium thiosulfate) that can reverse the toxicity. Treatment must be initiated quickly but can prove difficult due to the rapid progression of the toxin.

The drugs used to treat prussic acid toxicity can be difficult to obtain. It is advisable to contact your veterinarian before grazing potential toxic plants to make sure that your veterinarian will have availability to respond and the necessary drugs on hand to treat the cattle if a problem arises.

Cattlemen may want to take the following steps to prevent prussic acid toxicity:

- Never turn hungry cattle into a new pasture
- Take soil samples and fertilize accordingly
- Graze mature plants with 18 to 24 inches of height
- Wait until plants are cured before grazing after frost (usually at least 7 days)
- Rotate pastures to keep cattle from consuming lush regrowth
- Place 1 or 2 cows in a pasture and observe for problems before turning in all the cattle
- Test plants for the presence of prussic acid. Care should be taken though as false negatives can be seen if the test is not performed correctly.

Two types of tests exist for determining prussic acid levels. The first is quantitative and involves submissions to a diagnostic lab, such as the Oklahoma Animal Disease Diagnostic Lab. The second is a qualitative test which simply detects the presence of hydrocyanic acids and cyanide in fresh plant material. Most County Agriculture Extension Educators have access to test supplies.

Producers should be cautious that there are multiple toxins that can cause cattle deaths. It is recommended that appropriate veterinary diagnostics and testing be done to determine the ultimate cause of death. A fact sheet that contains information about prussic acid is available at Prussic Acid Poisoning | Oklahoma State University (okstate.edu).

OSU Research Aims to Save Billions for Beef Industry

By Alisa Boswell-Gore

STILLWATER, Okla. – Scientists in the Oklahoma State University Department of Animal and Food Sciences are working hard to stop the waste of billions of dollars of beef each year.

The U.S. beef industry loses $3 billion annually to meat discoloration. When beef is brown on the surface, it is discounted in price, and extensive discoloration leads to people throwing nutritious food in the trash.

Why does meat turn brown?

Most people associate the bright, cherry red color of meat with freshness, but brown discoloration doesn't mean your beef is bad. The discoloration is simply beef reacting to long-term exposure to oxygen.

When oxygen attaches to the protein myoglobin in muscles, oxymyoglobin forms and gives meat a bright cherry red color. When oxymyoglobin continues to be exposed to oxygen, it turns into metmyoglobin. This process is called oxidation, which causes a chemical reaction similar to apples or potatoes turning brown when exposed to air.

What's been done?

Gretchen Mafi, professor of meat science in the animal and food sciences department, conducted research using oxygen scavengers, small iron pouches that can be placed inside the bags used for beef retail transportation. The iron pouches remove oxygen, and therefore, lengthen the shelf life of the meat.

OSU scientists did not invent this method of packaging, said Mafi, but they have been testing the method for a private company to determine its effectiveness. In recently completed research, beef maintained its bright, red color for up to 23 days after being packaged with this process.

Along with the research, Morgan Pfeiffer, assistant professor of animal and food sciences, has been studying how long it takes meat to reach varying levels of discoloration and what people consider too much discoloration.

"We're trying to get it down to the hour when consumers would say they would no longer purchase that meat," Pfeiffer said.

Ranjith Ramanathan, an OSU meat quality associate professor, has focused his research on a condition called dark-cutters in which beef fails to have a bright red color.

Ramanathan and his research partners asked the question of why the meat of some cattle has a darker color when harvested by looking at protein and metabolite levels in dark cutting beef. They found these levels were different in darker red meat. Glycogen levels and mitochondria, which produces energy, are also different in darker beef compared to brighter red beef.

With this knowledge, producers can track whether specific cattle will exhibit dark meat or bright, red meat.

Stress, heat extremes, changes in weather and certain management practices can increase dark-cutting incidents, so if you can figure out which cattle are more prone to dark cutting at a genetic level, you can put management practices in place to help with that," Mafi said.

What's happening now?

Predicting which cattle are more prone to dark cutting meat with a high level of confidence is something Ramanathan and Mafi are still working toward.

Ramanathan said researchers are continuing to look at these protein and metabolic levels before applying their knowledge at the production level by studying the biological markers of cattle that relate to these differences.

In other research, Ramanathan and his colleagues are trying to determine if there are electrochemical factors that play into the discoloration of beef, pork and chicken by researching the properties in each of these meats that cause different oxygen levels, pH conditions and temperature. In collaboration with the OSU Department of Chemistry, they are also developing electrochemical sensors that can check antioxidant levels in beef extracts to determine if the beef will turn brown more quickly.

Meanwhile, Ramanathan, Mafi and Daqing Piao of the OSU College of Engineering, Architecture and Technology are attempting to develop a method to detect meat discoloration internally before it reaches the surface of the meat. The two scientists and their colleagues will also study the absorption and emission of light within beef products and its association with beef color change to develop storage strategies and other decision-making tools.

Take advantage of an opportunity to obtain **+8 CEU's**

Delaware County Extension Office will be hosting **Private Pesticide Applicator Trainings** by **appointment only** during the month of **September**.

Call **918-253-4332** or email **brooke.downing@okstate.edu** for additional information or to schedule your appointment!

Optional Appointments Include:

- Six 1 Hour Sessions to obtain **1 CEU**
- One 2 Hour Session to obtain **2 CEU's**

Location:

- Delaware County Office
  38267 US Hwy. 59
  Jay, OK 74346

Special Accommodations: Persons with disabilities who require alternative means for communication or program information, or reasonable accommodation need to contact Brooke Downing at 918-253-4332 at least two weeks prior to the event.

Master Cattleman Program

For Additional Information Contact:
Brooke Downing - OSU Delaware County Extension Educator
918-253-4332 or brooke.downing@okstate.edu

Master Cattleman Curriculum

- Business planning and management
- Marketing and risk management
- Nutrition and management
- Quality assurance and animal health
- Natural resources
- Genetics and reproduction

$150 Registration Fee

What Do I Get?

- Information/Education
- Oklahoma Beef Cattle Manual
- Master Cattleman farm gate sign
- Master Cattleman certificate
- Master Cattleman portfolio

Dates: Nov. 7th-March 27th
(No class on holidays)
Time: 6:30 PM-9:00 PM
Location: Northeast Tech Auditorium Afton, OK

DELAWARE COUNTY EXTENSION

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Delaware County Extension Office

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of 000 cents per copy.