According to Dr. Tim Evans, MU Extension State Specialist in Animal Health and Veterinary Toxicology, there have been several suspected instances of prussic acid/hydrocyanic acid (cyanide) intoxication in Missouri over the past few weeks. In one recent incident, over 70 adult cattle died rapidly after being turned into a pasture containing abundant new growth of various grasses, including Johnsongrass (*Sorghum halepense*). Within just a few hours of entering the new pasture, affected animals suddenly became recumbent and died or were observed to be walking around in an uncoordinated manner until they collapsed and died. Ten deceased animals were necropsied, with varying degrees of cherry red blood and minimal, if any, other gross pathologic changes observed. Carbohydrate overload, grass tetany, nitrate/nitrite intoxication, anaplasmosis, and toxins from harmful algal blooms have initially been ruled out as the cause of death in the necropsied animals, and prussic acid/hydrocyanic acid (cyanide) remains the most likely cause of death. Appropriate samples were collected and immediately frozen for additional, specialized testing to demonstrate the presence of cyanide in the rumen and selected tissues; however, it can be challenging to accurately measure the presence of cyanide in postmortem samples.

Many pastures in Missouri have been severely damaged during the current drought conditions, and there has been a great deal of discussion about the potential for the development of nitrate/nitrite intoxication, especially in connection with consumption of drought-stressed *Sorghum* species and corn. However, there appears to be less awareness of the risks of prussic acid/hydrocyanic acid intoxication associated *Sorghum* species during or immediately after drought conditions. Rapid growth of previously drought-stunted *Sorghum* species, especially Johnsongrass and sudangrass, or even lush green new growth of these forages can occur after a significant amount of rain has fallen upon drought-stricken pastures temporarily interrupting the drought or occurring after a drought when rainfall has normalized.

Potentially lethal concentrations of cyanogenic glycosides, such as dhurrin, can accumulate in the leaves of rapidly growing, immature *Sorghum* species. Ruminants are especially susceptible to prussic acid/hydrocyanic acid intoxication because rumen microorganisms facilitate the release of cyanide from ingested leaves. Cyanide is rapidly absorbed into the systemic circulation and distributed to the tissues, where normal cellular respiration is inhibited. Because tissue oxygen uptake from the blood is limited in affected animals, cherry red blood can often be observed initially. However, the most typical clinical presentation for this intoxication is sudden onset of weakness and/or recumbency followed by rapid death from a lack of oxygen in the cells (cellular anoxia).

Prussic acid/hydrocyanic acid intoxication can be treated with intravenous administration of sodium nitrite and sodium thiosulfate, but the rapid death of affected animals and the potentially limited availability of these antidotes may preclude successful treatment. Therefore, prevention is likely to be a more effective approach to this intoxication. Rapidly growing, immature *Sorghum* species should not be grazed until they are at least 24 inches in height and should, ideally, be tested for nitrate concentrations and cyanogenic potential prior to grazing. Since cyanide can “gas off” from these cyanogenic plants after they are harvested, producers should wait at least 14 days after cutting and baling *Sorghum* species for hay before feeding it
to livestock. Similarly, cyanide can also “gas off” from these forages after being ensiled for 60 to 90 days. Producers should consult their local veterinarians and extension personnel about how to safely introduce livestock to new pastures, as well as the need for necropsies and appropriate forage testing when multiple animals die rapidly after introduction to new pasture.