Genetic Selection Could Produce Cattle Resistant to Toxic Larkspurs

A study featured in the current issue of Rangelands follows five breeds of cattle to determine resistance to larkspur poisoning. The results indicate that ranchers may be able to selectively breed cattle for larkspur resistance, as well as other toxic plants.

Lawrence, KS (PRWEB) February 11, 2014 -- Rangelands -- Cattle are not picky eaters: Put them in a pasture with toxic plants and edible grasses, and they quickly swallow both. For ranchers, this diet comes at a heavy price, with up to 10 percent of steers that graze fields containing toxic larkspurs dying after eating the poisonous plants.

The authors of an article published in the current issue of Rangelands hope to change that by identifying cattle breeds that are more resistant to specific toxic plants. The current study focused on larkspurs. This large group of Delphinium species is toxic to many animals, including cattle. But how poisonous the plants are varies widely depending on the specific species of larkspur, where it is located, and the breed of the cattle. Steers that eat large quantities of larkspurs can show signs of poisoning in as few as 7 hours. They are most likely to eat high-protein larkspur pods, which are also the most poisonous part of the plants. Ranchers tend to move cattle at the first sign of poisoning, leaving valuable forage behind. The authors note that poisoning cases and related management practices cost ranchers in the western United States millions of dollars each year.

The current study focused on half-siblings in five breeds of cattle: two types of dairy cattle and three beef breeds. The steers were given the same dose of dried, ground tall larkspur and watched for 24 hours. They were then walked on a halter until their muscles weakened from larkspur poisoning. Symptoms were recorded, and the animals rested until they could walk again without tiring.

The authors found that all five breeds of cattle weakened on average within about 30 minutes but that the Line 1 Herefords from ARS Fort Keogh Livestock and Range Research Laboratory averaged less than 9 minutes. The dairy breeds had greater resistance to tall larkspur than the beef breeds, and Jersey cattle, a breed noted for having little genetic diversity, lasted the longest. Brahman cattle were particularly susceptible to larkspur poisoning.

An unexpected result of the study was in the reactions of individual cattle. Some Angus steers walked for 40 minutes and were labeled as resistant, but other Angus steers were too sensitive to the toxin to be exercised. For each breed tested, at least one animal was labeled as resistant to tall larkspur.

The results indicate that ranchers may be able to selectively breed cattle for larkspur resistance. If a gene marker was found, ranchers could submit a blood or hair sample for genetic testing of vulnerability to the toxic plants, just as they can today test for coat color or meat quality. The authors are also working to identify such resistance to other toxic plants, such as lupine.

Full text of the article “Mitigation of larkspur poisoning on rangelands through the selection of cattle,” Rangelands, Vol. 36, No. 1, 2014, is now available.

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