

Can Locoweed Be Good Feed?

A Study of the Toxicity and Protein Content of Drummond's Milkvetch

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Many areas in Northeastern New Mexico have an economy based on the production of livestock. Providing nutritious feed and keeping livestock healthy are top priorities of all ranchers. Although most plants in our area are either beneficial, or do no serious damage to livestock, several plants in particular are notorious for problems they have caused to livestock. They are known as White Locoweed (*Oxytropis sericea*) and Purple Locoweed (*Astragalus mollissmus*).

There has been a large amount of research on locoweed problems in Northeastern New Mexico, with the main focus of this research being on White Locoweed (*Oxytropis sericea*) and Purple Locoweed (*Astragalus mollissmus*). Since there are seventeen other species of locoweed in the area a curiosity arose as to why the other species were not studied more thoroughly. According to the book, "Common Locoweeds and Vetches," there are several other species containing swainsonine, the toxic chemical in both White Locoweed (*Oxytropis sericea*) and Purple Locoweed (*Astragalus mollissmus*).

Neurological effects of swainsonine toxicity range from disorientation to permanent nervous system damage and possibly death. Animals affected by swainsonine lose the ability to function correctly. They become excited when stressed, are inattentive to their surroundings, lose muscular coordination, and become depressed. This condition is called "locoism."

There is a plant in Northeastern New Mexico called Drummond's Milkvetch (*Astragalus drummondii*) or "rattleweed" which is listed as toxic with swainsonine in "Common Locoweeds and Vetches." It was named after Thomas Drummond. It has erect stems, bristly and hairy foliage, flowers

nodding with whitish petals and lilac keels, and pods drooping on a stalk extending out of the calyx. It is strongly perennial, and is usually 30–60" in. tall. Its habitat includes areas such as grassland or areas where oak brush, sagebrush pinion-juniper woodland, or rarely pine forest. It grows in light, dry or modestly moist and heavy alluvial soils. It is very prevalent and cattle eat it readily.

Many producers consider it non-toxic and an excellent feed, which is probably because there is said to be a larger amount of protein in the plant. Protein is the chemical compound that forms the basis of the structural framework of living matter. Animals need a regular intake of protein for the repair, replacement, and growth of body tissues.

This raised the questions: Is the plant only toxic in some areas? Were the tests in the book flawed? With these questions in mind, I decided to investigate both possibilities.

My hypothesis was that Drummond's Milkvetch (*Astragalus drummondii*) would be proven non-toxic regardless of geographic location, and that it would prove very nutritious and could be ranked as good forage.

The project began by collecting info from the Internet, locoweed reports, and bulletins. Once enough info was gathered four sites were established in Northeastern New Mexico where Drummond's Milkvetch (*Astragalus drummondii*) was growing. Plants were collected in late June when seed heads and flowers were both present.

Large plants were picked and divided into parts showing flowers, seedheads, stems, and leaves. These were preserved using a plant press. Seeds were also saved from each plant. The remainder of the plant was ground with flowers, seeds, stems,

and leaves. Pressed plants, seeds, and ground plant material were sent to ARS/POISON PLANT LAB in Logan, Utah. Expert identification was obtained on the plant parts and protein analysis to determine feed value. When data was returned it was recorded and analyzed.

Materials used included a plant press, a bag, and a pocketknife. The plant press was used to preserve plant material. The bag and the pocketknife were used to gather Drummond's Milkvetch (*Astragalus drummondii*).

What We Learned

Professional analysis found that the protein content (on the dry matter basis) of Drummond's Milkvetch (*Astragalus drummondii*) in the four areas where it was collected is as follows: Kiowa 17.7%, Capulin 20.3%, Grenville 17.8%, Anderson 16.8%.

According to this data, if there were no swainsonine in Drummond's Milkvetch (*Astragalus drummondii*), it would be very healthy and an excellent forage. According to the USDA/ARS Poison Lab in Logan, Utah there was no detectable swainsonine in any of the four samples. According to the results of this study, Drummond's Milkvetch (*Astragalus drummondii*) is perfectly safe for livestock consumption, and it can be considered an excellent forage.

Levi Newkirk's research and presentation earned him 2nd Place in the 2003 High School Youth Forum held in Casper, WY at the annual SRM meeting.

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