



# CORN AND THE RUMEN/C1

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**A**lpaca producers often depend on their peers for advice on all aspects of alpaca production, including nutrition. Although most mentors and sellers share their knowledge with only the best of intentions, sometimes the information previously given to them is incorrect or misleading. Perhaps you have heard some variation of the following:

*Cracked corn was found in an ulcer upon necropsy. The veterinarian's conclusion was that the grain had caused the erosion.*

This is highly unlikely because:

A) Cracked corn is rapidly fermented in the healthy rumen/C1 and is usually not identifiable after two or three hours. Most microbes ferment corn preferentially to forage. Although all digestion requires energy expenditure, corn yields more energy output with less energy input than any forage.

B) Ulcers take weeks or even months to develop, usually after severe, prolonged, or chronic stress. Stress promotes rumen disruption and abnormal digestion. Some veterinarians believe that ulcers are the result of poor gastric motility (stomach emptying and acid backwash). Feed consumption triggers peristaltic movement of semi-digested feed through the gut. If consumption is sporadic or non-existent, than digesta will not flow properly. Attached or otherwise non-motile microorganisms depend on digesta

movement to bring nutrients. Alpacas that have experienced an extreme stress such as a lengthy transport may refuse feed for extended periods of time afterwards. If concentrated probiotics are not given immediately, there will be serious repercussions for gut microorganisms and motility. Both the proliferation of toxin-secreting pathogens and the potential for gastric backwash can lead to ulcers. However, not all stresses are so severe. In these cases, ulcers may take longer to develop. Animals that have such erosions may not display obvious alterations in feed intake until the ulcer is close to perforation. Other symptoms, such as those listed below, may be easy to miss, and are associated with more than one disease. However, alpacas that develop ulcers within a few weeks of a severe stress, and who have little or no appetite, will generally display an unthrifty appearance. Be aware when any member of your herd experiences such stress and keep tabs on their condition for several weeks afterwards.

According to Dr. David Anderson at KSU College of Veterinary medicine: "Clinical signs we most often associate with ulcers include decreased activity, increased recumbency, lying in lateral recumbency [lying on side], decreased feed intake, weight loss, and occasionally abdominal pain noted by poetical

changes such as arching of the back.” Unfortunately, affected alpacas do not always display symptoms.

C) To find identifiable corn fragments in the rumen/C1 upon necropsy, either a) the animal had to have eaten immediately prior to death; or b) normal rumen function had been disrupted. The latter is much more likely. Alpacas with ulcers deep enough to trap corn fragments often have reduced appetites.

**Conclusion:** The ulcer existed prior to the consumption of the corn. The presence of the fragment in an animal that had probably not eaten normally for some time supports this hypothesis.

Ulcers can be prevented with the use of probiotics. Concentrated probiotics (paste or drench) should be given before, during, and after major stresses such as weaning, showing and transport. They can prevent or ameliorate the effects of unplanned stresses when given as soon as possible afterwards. Be aware of any alpacas that experience severe, prolonged, or chronic stresses, these are the ones most likely to

trigger rumen disruption that can lead to ulcer development. Ulcers are reversible up to a point; the lining of the gut can heal itself if the source of the irritation (toxin-secreting pathogens and possibly acid backwash) is removed. Prevention is cheaper, easier, and less stressful on all concerned than treatment.

*About the Author:*

*Lark Burnham received a B.S. in Animal Science (1979) from Kansas State University and an M.S. in non-ruminant nutrition (1995) from Kansas State University, Manhattan, and a Ph.D. Doctorate in ruminant nutrition (2004) from Texas Tech University, Lubbock. Her special interests are comparative nutrition, the role of the micro flora in all mammals, fiber digestion, and probiotics. Lark currently works for Natur's Way, Inc., Horton, KS which produces MSE probiotics.*



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