

"Floppy Kid" Syndrome

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Introduction. During the 1995 kidding season goat producers suffered from an unprecedented neonatal mortality in kids. Most cases we are aware of occurred in west Texas; however, we received calls from producers in many other states across the U.S. that described the same problem. Although for many goat producers this is a new condition, the disease has been previously reported in several parts of the U.S., Canada and in Europe.

Clinical Signs. Characteristically, goat producers reported that newborn kids seem to do fine for a few days after birth, beyond which they start to show depression, weakness and flaccid paralysis without signs of diarrhea and have normal rectal temperature. One common clinical sign reported is distension of the abdomen. The signs of depressions and paralysis seem to affect the animals in waves. At one particular point, kids look so bad that they give the appearance of being dead. After some time they seem to recover spontaneously only to go back into coma 15-20 minutes later. Affected animals that are not treated may die within a few days. The condition does not seem to respond to antibiotic or vitamin E and Selenium treatments. Because the clinical appearance is that of very weak animals "lacking energy" most producers try to solve the problem by force feeding affected kids. This only makes the problem worse since this condition seems to be the result of over-consumption of milk.

Etiology. The exact cause of the "floppy kid syndrome" is not known. We believe that it is the result of a combination of factors including consumption of excessive amounts of milk by the kids as well as the proliferation of an "infectious agent" in the gastrointestinal tract. All producers that brought affected kids to TAES-SA indicated that they had improved the nutrition of the nannies with respect to previous years. Either they were supplementing the nannies with corn or a concentrate feed or they had put the nannies in irrigated/improved pastures some time before parturition. For this reason milk production by the nannies and the quality of milk seemed to be better. In addition, some producers started to kid in enclosed pens (as opposed to kidding on the range) giving the kids an opportunity to suckle more often and consume more milk. These observations were supported by the fact that all affected kids that we necropsied at TAES-SA had a stomach full of milk. The excessive amount of milk in the stomach seems to predispose to the proliferation of microorganisms (probably *Escherichia coli* or *Clostridium*) in the gastrointestinal tract that leads to changes in the acidity (pH) in the digestive tract, intestinal atonia (lack of movement to the intestine) and systemic acidosis. The latter is the cause of some of the signs associated with the disease such as weakness and flaccidity (these signs are not the result of the lack of energy).

Necropsy changes. The most remarkable change found in affected kids was a very dilated stomach (abomasum) that was full of coagulated milk and had a very strong acid

smell. The mucosa of the stomach also showed multiple small hemorrhages (petechia). In cases in which kids had been force fed it was common to find the rumen (first stomach) full of milk. The feces in the rectum were very solid and hard in consistency. In some cases, evidence of systemic infections including pneumonia, multi focal abscesses or polyarthritis were found. We believe that for the most part these infections were secondary and occurred late in the course of the disease. At least in the cases affected with pneumonia, they seemed to have been the result of milk being forced into the trachea during artificial feeding.

Diagnosis. Confirmation of the "floppy kid syndrome" can only be done by determining the venous blood gas concentration in affected animals. However, in most cases this is not possible. In such cases, the diagnosis needs to be established on the basis of clinical history and necropsy findings. Several other diseases need to be ruled out in the differential diagnosis, including white muscle disease (vitamin E and Se deficiency) and enterotoxemia (overeating).

Treatment. In order to be successful, treatment needs to be initiated as soon as possible after the signs of the disease appear. Under ideal conditions affected kids need to be treated by a veterinary practitioner with isotonic sodium bicarbonate solution intravenously, sufficient to replace the calculated base deficit [body weight (Kg) x 0.5 x base deficit] over 1-3 hrs. However, in most cases a more empirical approach can be taken to solve the problem. The first thing that we recommend is to leave affected kids off milk for 24 to 36 hrs. Again, because the kids look very weak, it has been difficult to convince goat producers that the problem is due to overfeeding and not to lack of energy. However, keeping kids temporarily off milk is probably the single most important thing in treating these cases. Secondly, the acidity of the stomach needs to be neutralized by administering a bicarbonate (baking soda) solution. For this purpose, dissolve 1 teaspoon of baking soda in one glass of water and administer 10-20- ml of this solution orally. Repeat this procedure 2 to 3 times within the following 3 to 6 hours. Most kids will show clear improvement with this treatment within the following 6 to 10 hours. Treated kids first become more active and will initially pass very solid feces that subsequently turn into diarrhea. This is a good sign and an indication that the intestines are moving again. The third part of the treatment consists of administering a wide spectrum antibiotic to prevent secondary infections. After 36 hours the affected kids can be put back with their mothers if they take them. Otherwise they would need to be raised on a milk substitute. Initially, artificial milk needs to be diluted with water and small amounts of milk (100 ml) need to be given 3 to 4 times a day for the first 2 days, then follow the manufacturers instruction.

Prevention. There is not a good way to prevent "floppy kid syndrome" other than to avoid over consumption of milk. In dairy goats that is done by milking the goats before putting them back with the kids. In meat/Angora goats this is difficult to accomplish. When weather conditions allow, it is probably better to kid in the pasture. On pasture conditions, the constant movement of the nannies prevents kids from ingesting large quantities of milk in a short time.