

Fescue Toxicosis in Commercial Cattle Feeding Operations

Tim Jordan, D.V.M.
Palo Duro Veterinary Service
109 N. 15th St.
Canyon, TX 79015

Tall Fescue (*Festuca Arundinacea Schreb.*) accounts for approximately 35 million acres of grassland in the U.S. Fescue pastures continue to be a major cattle grazing staple in the transition zone of the U.S. including the south central regions of the country. Research has shown that fescue can contain the endophytic fungus *Acremonium coenophialum* which is reported to contain toxic factors that cause various disease conditions in cattle that are grazing contaminated pastures (1). The conditions or disorders associated with the grazing of endophyte infested fescue include fescue foot, summer syndrome, fat necrosis, agalactia, and decreased reproductive efficiency (1, 2, 3, 4).

Although fescue related problems are primarily seen with cattle grazing fescue pastures, health related disorders may also be seen in the finishing period. These conditions include primarily summer syndrome and decreased performance. Only extremely rarely are the conditions of fescue foot and fat necrosis seen in feeder cattle. The major economic considerations of fescue-related problems focus around the so called summer syndrome.

The summer syndrome in the feedyard is seen as a problem of acute morbidity and mortality. Literature exists that describes the conditions in cattle grazing fescue pastures (2) there are no publications that address this situation in feeding operations. Subjective data will show that affected cattle are from fescue grazing areas. It has been the author's experience that these cattle are primarily from Missouri, Kentucky, and Tennessee grazing operations. Also, ambient temperatures are in excess of 85 degrees Fahrenheit and relative humidity is in excess of 40%. Generally, cattle are noted as normal in the early morning as the ambient temperature increases, animals become progressively more affected.

Clinically, animals are noted to be unthrifty and rough haired. There may be cattle in the group that are in better physical condition and are not affected. Salivation is excessive and respiratory rate increased with a majority of the cattle exhibiting open mouth breathing. Cattle showing these signs may also show a predilection for water, wet areas, and shade almost to the point of obsession. Affected cattle resist movement and several may become acutely recumbent if forced to move. Rectal temperature will be increased often in excess of 107 degrees Fahrenheit.

Clinico-diagnostic rule outs from subjective and objective data available would have to include, in addition to fescue toxicosis; heat stroke, organophosphate toxicosis, Pre-Type II and Type II Ostertagiasis, acute viral infection, and acute acidosis. Feed-related toxic contamination may also be considered in the preliminary evaluation.

The diagnosis of fescue toxicosis and summer syndrome depends upon assimilation of clinical presentation with clinical and gross pathology data. Animals affected with the summer syndrome will show a stress leukon, with plasma-fibrinogen ratio normal to increased. RBC cholinesterase concentrations may be decreased if the cattle have been processed with an organophosphate dip or pour-on. Brain cholinesterase levels, however, will be decreased only on those animals experiencing death related to organophosphate toxicosis. Blood selenium will be low to marginal, but this is generally the case in cattle from this area of the country whether or not endophyte infested fescue has been grazed. Serum pepsinogen will be normal in these cattle. Researchers have shown that serum prolactin is an excellent diagnostic aid for the diagnosis of endophytic fungus fescue infestation. Unfortunately, veterinary medical diagnostic laboratories do not perform serum prolactin assays on a routine basis.

Gross pathological examination of animals that have died will nonspecific lesions. Pulmonary congestion and pulmonary edema may be marked. Subendocardial and epicardial hemorrhage is generally seen in animals that die from this condition. "Paint-brush" intestinal hemorrhage may also be seen much like as seen in organophosphate toxicosis. Decomposition of tissue is rapid due partly to the typical high ambient temperature at the time of death. The lack of fulminant bronchopneumonia or other infectious conditions should be viewed as a diagnostic aid.

Treatment of cattle affected with summer syndrome in the feedyard is purely symptomatic as no antidote exists for reversal of clinical signs. The treatment goal is to reduce the effects of increased body temperature on the animal. Copious amounts of water should be sprayed on the cattle. The surrounding areas should also be wetted. Care should be taken if these cattle are to be moved as the added stress of movement can cause acute recumbency and death. Oral electrolyte therapy has been attempted with minimal

additional effects. Dipyrone has been used by practitioners in an attempt to further lower body temperature with minimal results.

Preventative procedures at the feedyard level should focus upon early recognition of predisposed cattle, minimization of stressful procedures such as processing immediately upon arrival and elimination of handling during the warmer periods of the day.

The author advises his clients to establish conditional acceptance of the cattle from the seller of cattle that fit this description upon arrival during the Spring, Summer, and early Fall months and are from fescue grazing areas. Even though there is a conditional acceptance, all care should be taken to prevent acute toxicosis from being realized.

Although a great deal of work exists showing the detrimental effects on performance on grazing endophytic tissues, little data exists that examines performance once the cattle are removed from affected pastures and placed on grain concentrate feeds. The preceding discussion has identified the problem that may occur with some cattle that are transported and subjected to concurrent heat stress. This condition would of course impact performance of affected cattle. Animals that recover tend to meet average production criteria during the remainder of the feeding period.

TABLE 1. Fescue Associated Decreased Performance:

	Endophyte Free Fescue	High Endophyte Fescue
Growing Period: ADG	0.93 kg/day	0.49 kg/day
Grain Feeding:		
Initial Weight	445 kg	349 kg
Day Mother Intake	8.83 kg/day	7.71 kg/day
ADG	1.09 kg/day	1.18 kg/day
Conversion	8:1	6.6:1
Addition of Thiamine to Supplement 0.5 gm,hd/day		+0.19 kg/day

Recent work done at the University of Kentucky (5) suggests that if heat stress and acute toxicosis does not occur, the performance of cattle from affected pastures may exceed the performance of cattle from non-affected pastures (Table 1.). In this study, dry matter intake was 12.7% lower in affected cattle, but dry matter conversion was 18.5% more efficient in affected cattle. ADG was also 7.8% higher in the affected cattle.

It must be noted that there was little transportation stress incurred, ambient temperature during the initial period of study was not in the critical range. One could expect that a wide range in performance would be seen do to the effects of prevailing weather conditions.

In summary, cattle from endophyte infested fescue pastures can experience severe health problems even after removal from a contaminated pasture. The primary problem seen with fescue associated summer syndrome in the feedyard is acute death resulting from elevated body temperatures. This condition is seen most commonly during periods of increased ambient temperatures upon arrival at the feedlot. Veterinary practitioners should be aware of this condition as quick medical attention is necessary to circumvent high mortality rates.

References

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