

A Field Investigation of Tall Fescue Toxicosis in Beef Cattle in Southern Iowa

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Introduction

Tall fescue (*Festuca arundinacea*), a variety named Kentucky 31, was first planted in the 1940s in the southern United States. Fescue is now established on more than 35 million acres in the United States. It is estimated that 600 to 800 million dollars are lost to the US beef industry yearly due to endophyte infected (EI) fescue. Fescue is a perennial grass that is used for livestock feed, turf grass and erosion control. The ability of fescue to adapt to a wide variety of environmental conditions and the ability to resist overgrazing has increased its usage for livestock feed. In the 1970s it was discovered that tall fescue contained an endophyte (*Neotyphodium coenophalium*) that had deleterious effects on animals consuming this grass.

There are three syndromes in ruminants associated with consumption of EI fescue: (1) Fescue foot—a syndrome characterized by animals with rough hair coats, tenderness of legs, loss of hooves, tail switches and ear tips and congested blood vessels leading to dry gangrene; (2) Fat necrosis—a syndrome characterized by hard masses of fat in the abdomen along the intestinal tract that can result in digestive disturbances and difficult births; and (3) Fescue toxicity (summer slump)—a syndrome characterized by reduced average daily gains, reduced conception rates, decreased milk production, intolerance to heat, failure to shed winter hair coats, elevated body temperatures, increased respiration rate and nervousness. Also, mares grazing EI fescue may have increased gestation periods, reduced foal weights, abortions and decreased milk production.

Iowa has seen an increase in pastures infected with EI fescue. The southern two tiers of counties in Iowa seem to be especially affected by EI fescue. The winter of 1996 and spring and summer of 1997 were noted for an increase in problems associated with EI fescue in Iowa.

Field Investigation History

A field investigation was performed on two farms in south central Iowa in 1997. The purpose of this field investigation was to establish whether EI fescue was present on Iowa farms and whether it was responsible for any clinical problems.

Farm One

The first farm visited had approximately 204 head of mixed breed commercial cows that were grazed on eight different pastures during the grazing season. This herd was wintered on one local pasture and fed hay all winter. The summer pastures were a mix of fescue, brome, red clover and Kentucky blue grasses. Problems were noted in the fall and winter of 1996 with cows from 2 years to 13 years being in poor body condition. Some exhibited lameness, and many cows had a loss of the tail switch.

The majority of the herd was spring calving and had calved by the time of this visit. Calving season started in March and extended until May. Reproductive efficiency did not seem to be affected to any significant degree. All calves that were raised on this farm were retained and fed on the farm. Yearling calves fed in a feedlot on the farm did not seem to be experiencing problems related to EI fescue ingestion.

During the winter of 1996 at least three cows in the herd had lost a hoof. As a result these animals became recumbent and subsequently died from complications from being unable to stand. There were an additional 15 head of cows that were lame during the winter of 1996. The range of lameness was from mildly affected to severely affected. The sloughing of hooves was attributed to ingestion of EI fescue, which caused vasoconstriction and eventual gangrenous necrosis.

Six samples of fescue grass from three of the pastures and two samples of baled hay were obtained that day. The fescue grass samples from the pastures were determined to be infected with endophyte. The hay samples were not tested.

Farm Two

This producer had approximately 75 head of purebred Red Angus cows with calves. For the previous five years this producer had operated a managed intensive grazing operation. This herd was rotated to EI fescue pastures during the summer-fall grazing season. The minimum time that the cows grazed an EI fescue pasture in the summer was three months.

During the winter of 1996 one cow in the herd developed a lesion above the coronary band on one front leg. A line of vasoconstriction developed, and the cow eventually lost the hoof. This cow died as a result of complications from the loss of the hoof.

This herd was a spring calving herd that started calving in March and was finished by April. The 50 early calving cows were pastured on an alfalfa-clover-trefoil grass pasture that was divided into three 5-acre paddocks. Cows were

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rotated through these paddocks as determined by available forage. There was one cow out of the 50 that was grazing the alfalfa-clover-trefoil grass that seemed to be unaffected by fescue ingestion. This cow had shed her winter coat, had no loss of tail switch and was in good body condition. The 49 remaining cattle all exhibited some clinical signs of ingestion of EI fescue.

There were 25 additional cows that were kept on a fescue pasture that was planted as endophyte negative fescue with approximately 2% red clover. This pasture had been reseeded five years previously with Fawn fescue seed, which is endophyte negative. About 50% of the cows grazing this pasture had lost their tail switch during the winter months of 1996 or were in the process of losing their tail switch at the time of this investigation, spring 1997. None of the 25 cows on the fescue-clover pasture had lost their winter hair coat.

EI fescue can depress prolactin secretion, which in turn decreases milk production; however, all 75 cows in this herd seemed to be milking normally as evidenced by the good condition of their calves. No ear tip necrosis was noted in any of the 75 cows in this herd.

Four samples of fescue grass were obtained from various paddocks from the second farm and subsequently examined. All four samples were determined to contain EI fescue. EI fescue was even found in the paddocks that were thought to be only alfalfa-clover-trefoil mixtures.

Both of these herds were followed throughout the 1998 summer grazing season and 1998-1999 winter feeding season. These herds are not experiencing any significant problems associated with consuming endophyte-infected fescue at this time. Pregnancy rates, calving rates and cull rates have all returned to levels experienced prior to the 1996-1997 grazing season.

Discussion

Iowa is having an increasing problem associated with EI fescue in pastures and the problems it causes in grazing animals. There have been several explanations for the increase in EI fescue grass in Iowa pastures. EI fescue is easily adapted to a wide range of soil and climatic conditions, and is extremely heat tolerant, drought tolerant and tolerant to over grazing. Intentionally seeding pastures with EI fescue has been the reason for the increase. The conservation reserve program has resulted in additional acres planted with EI fescue. Hay from these acres has been used as cattle feed, and this has allowed transmission of EI fescue seed to pastures where this hay is fed. Another cause of EI fescue grass in pastures is use of infected fescue seed to reseed roadside construction sites. The infected fescue seed can drift from adjacent roadsides into pastures and spread within the pasture once it is established. If given a choice of other grasses cattle will selectively not graze EI fescue. This allows the endophyte-infected fescue to spread within a pasture once it is established.

It has been speculated that individuals within a herd have some tolerance to EI fescue. It has also been speculated that there are certain breeds that tolerate endophyte-infected fescue better than others. In other areas of the United States where fescue has been established since the 1940s there has been time to cull individuals in a herd that don't tolerate EI fescue. There has been time to select animals that can graze EI fescue and perform normally. With the relatively recent establishment of EI fescue pastures into Iowa there has not been time to cull animals that don't perform normally while grazing endophyte-infected fescue.

From personal communication with extension agents in southwest Iowa it seems that EI fescue pastures and the related problems have increased dramatically within the last five years. In particular, during the 1996-1997 grazing season there were more producer complaints of poor performance in beef herds grazing EI fescue pastures. Since 1996-1997, performance has returned to levels experienced prior to this grazing season. We were unable to determine a cause for this one-year increase in severe clinical signs and problems associated with grazing.