

# Possible Fescue Toxicosis in Incoming Feeder Cattle

Louis Perino, D.V.M.

Research Associate

Department of Veterinary Parasitology, Microbiology  
and Public Health

College of Veterinary Medicine

Oklahoma State University

Stillwater, OK 74078

## Introduction

Cattle are received into feedyards in the Southwest from nearly all parts of the nation, including groups off of summer fescue pastures. This paper presents a case of epidemic heat stroke in several groups of cattle received during June from summer fescue pastures known to be infected with the endopytic fungus *Epichloe typhina* (*Acremonium coenophialum*). Given the absence of a definitive diagnostic test to confirm fescue toxicosis or "summer syndrome" it is based on circumstantial evidence, history, clinical observations, laboratory and post-mortem findings and rule outs.

## Background

Tall fescue is a well adapted perennial grass grown on 5-6 million acres in the transitional zone of the U.S. Sometimes, toxic syndromes and/or reduced animal performance have been associated with it. Specific syndromes that have been associated with tall fescue include fescue foot, fat necrosis, agalactia and summer syndrome. The latter is considered the most consistent syndrome associated with tall fescue and probably results in the greatest loss of income. (1) The possible interrelations between these have not been elucidated.

Summer syndrome, or reduced performance associated with high temperatures, is the collective term used for the following symptoms: decreased heat tolerance, reduced growth or milk production, decreased feed intake, rough hair coat, elevated body temperature, increased respiration and heart rate, lower serum prolactin levels, excessive salivation, reduced reproductive performance, and animal seeks wet spots or shade. Experiments and trials have been reported in the literature documenting these. (2-9)

When a strain of fescue that causes signs of summer syndrome was compared to one that does not some differences were noted: very high frequency of infection with the fungal endophyte *Epichloe typhina* (*Acremonium coenophialum*), high level of N-acetylcholine and N-formylcholine, higher level of GABA, lower level of perloine. (2) The level of endophyte infection has shown a good correlation to the severity of the signs seen. (1-4, 6-8)

## Case Report

In this case, cattle grazing endophyte infected fescue during the summer were shipped to feedlots in the Panhandle region of the Southwest in June. Upon arrival and during the cool part of the day the cattle appeared unremarkable, except for perhaps a rough hair coat. As the environmental temperature increased they began to show signs of heat stress. Other groups of cattle, including those nearly at slaughter weight, remained unaffected. Open mouth breathing, salivation and gathering around water sources were noted in nearly all the affected cattle. After 24 to 48 hours of exposure to extreme environmental temperatures, mortality rates as high as 10% were noted in some groups, frequently in the early part of the second or third day. Dying animals had extremely high agonal rectal temperatures. Mortality abated in 3 to 5 days, however, increased sensitivity to heat was noted for 2-4 weeks. Not all groups were affected to the same degree.

Treatment was symptomatic and directed at lowering body temperature. Management steps such as providing shades, water holes and sprinklers to reduce the effects of high environmental temperatures also seemed beneficial.

Gross post-mortem lesions were non-specific and included congestion and petechial hemorrhages of various organs, especially the endocardium, along with wet, edematous appearing lungs and sometimes very fluid rumen contents with a pH of 6 to 6.5. Histologically, lesions were also described as non-specific and include pulmonary edema and subendocardial and myocardial hemorrhage. (a)

Hematology revealed a neutrophilia and lymphopenia suggestive of a stress response. Blood cholinesterase levels were normal (0.245). Total soluble salts (13000 ppm) and pH (5.6) of rumen contents were normal, as were cholinesterase inhibition tests. Blood Selenium levels were low (61 ppm). (a)

Performance of the survivors during the ensuing feeding period, as assessed by actual finish weights versus computer

---

(a) *Histologic and hematologic studies were performed by the Texas Veterinary Medical Diagnostic Laboratory at Amarillo.*

predictions, average daily gains and feed conversion, was reduced 5 to 10% ( $P < .02$ )

### Discussion

The clinical presentations, laboratory and post-mortem findings support a diagnosis of heat stroke. Circumstantial evidence of a known history of grazing endophyte infected fescue, an apparent increased susceptibility to heat stress, rule-out of some other potential causes and reduced performance indicates the possibility that this was a manifestation of summer syndrome precipitated by the additional stresses associated with shipping and indoctrination at a feedyard and possibly marginal Selenium levels.

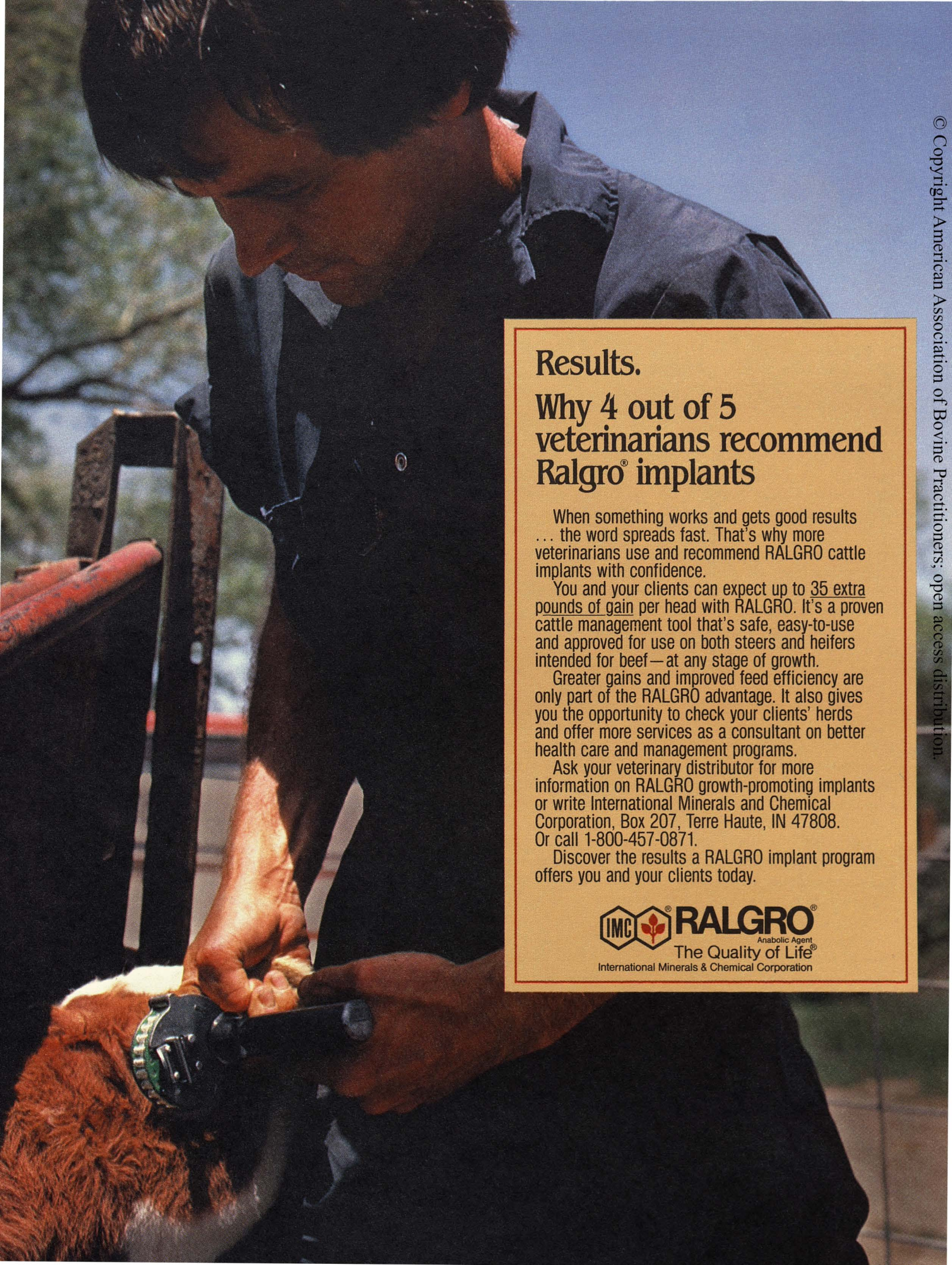
The lack of a definitive diagnostic test for fescue toxicosis precludes conformation of it as the definitive etiology. Along the same lines, the lack of delimitation of the physiologic basis for summer syndrome limits therapeutic

strategies to symptomatic treatment.

Hopefully, further work will shed light on the mechanisms of fescue toxicosis and provide a means of diagnosis and a rationale for therapeutic and management recommendations.

### References

1. Hemken, R.W. et. al. (1984). *Journal of Animal Science*, v. 58, n. 4, pp. 1011-1016.
2. Bond, J. et. al. (1984). *Journal of Animal Science*, v. 59, n. 3, pp. 584-593.
3. Jackson, J.A., et. al. (1984). *Journal of Animal Science*, v. 58, n. 5, pp. 1057-1061.
4. Schmidt, S.P., et. al. (1982). *Journal of Animal Science*, v. 55, n. 6, pp. 1259-1263.
5. Hemken, R.W., et. al. (1981). *Journal of Animal Science*, v. 52, n. 4, pp. 710-714.
6. Boling, J.A., et. al. and Fron, M.J. et. al. (1984). Reported in Herd Health Memo (1984), LaBore, DE et. al. ed., n. 2, pp. 17-19.
7. Boling, J.A. and Hemken, R.W. (1981). *Animal Nutrition and Health*, Oct., pp. 13-14.
8. Hoveland, C.S., et. al. (1983). *Agronomy Journal*, v. 75, n. 5, pp. 821-824.
9. Wallner, B.M., et. al. (1983). *American Journal of Veterinary Research*, v. 44, n. 7, pp. 1317-1322.



## Results.

### Why 4 out of 5 veterinarians recommend Ralgro® implants

When something works and gets good results ... the word spreads fast. That's why more veterinarians use and recommend RALGRO cattle implants with confidence.

You and your clients can expect up to 35 extra pounds of gain per head with RALGRO. It's a proven cattle management tool that's safe, easy-to-use and approved for use on both steers and heifers intended for beef — at any stage of growth.

Greater gains and improved feed efficiency are only part of the RALGRO advantage. It also gives you the opportunity to check your clients' herds and offer more services as a consultant on better health care and management programs.

Ask your veterinary distributor for more information on RALGRO growth-promoting implants or write International Minerals and Chemical Corporation, Box 207, Terre Haute, IN 47808. Or call 1-800-457-0871.

Discover the results a RALGRO implant program offers you and your clients today.

 **RALGRO**<sup>®</sup>  
Anabolic Agent  
The Quality of Life<sup>®</sup>  
International Minerals & Chemical Corporation