in lower (P<.01) serum vitamin E levels. Although vitamin E concentration was not significantly influenced by Tasco™ treatment, the seaweed product tended (P<.10) to increase whole-blood selenium in both E+ and E- steers. Upon arrival to the feedlot, monocyte phagocytic and MHC class II activity was higher (P<.01 and P<.08, respectively) in steers that grazed Tasco™ pastures as compared to non-treated pastures. Monocyte immune function was enhanced in E+-Tasco™ steers compared with E+-non-Tasco™ steers, throughout the finishing period. Both E+ and E- Tasco™-treatment steers had higher marbling scores (P<.05) and USDA quality grade (P<.15).

In these studies, Tasco™ application to fescue pastures reversed immunosuppressive effects associated with endophyte-infected fescue, and positively influenced select carcass characteristics. These findings suggest an efficacious and economically feasible approach to alleviating production and health concerns of beef cattle on fescue forage systems.

[a]Schreb
[b]Morgan-Jones and Gams, Glenn, Bacon, and Hanlin
[c]Angus and Angus x Hereford
[d]3/4 Angus, 1/4 Brahman

Alleviating Tall Fescue Toxicosis Problems with Non-toxic Endophytes

Larry Hawkins, Joe Bouton, Nick Hill, Carl Hoveland, Mark McCann, Fred Thompson
University of Georgia, Athens, GA

Introduction

In 1943, a cultivar of tall fescue (*Festuca arundinacea*) later known as Kentucky 31[2] was released for sale. This cool season grass became widely distributed in the southeastern United States because it was persistent in the face of drought, grew on poor soils and provided good erosion control, as well as large amounts of forage for hay or grazing.[2] By 1950, it was recognized that animals grazing tall fescue did not perform as well as forage analysis would predict.[2] In 1977, research (Bacon) revealed the presence of an endophyte, *Neotyphodium coenophialum*, in the intercellular spaces of the leaf sheath. Later research connected this endophyte with what is now recognized as fescue toxicosis.[4,5] With the discovery of the endophyte in tall fescue, the solution to the toxicity problem became obvious: remove the endophyte.[1] With endophyte-free fescue, animal performance improved but the plants were not as hardy, and stand loss in endophyte-free fescue became a problem.[3]

Materials and Methods

Our research at the University of Georgia replaced the wild-type endophyte that produces large amounts of ergot alkaloids, primarily erogovaline, with a non-toxic endophyte (NT) that lacks ergot alkaloid production. The tall fescue with NT were tested against the same cultivars containing naturally occurring endophyte (E+) and endophyte free (E-) in a lamb grazing trial during spring 1998 and fall 1999. Using lambs in this trial allowed us to obtain an initial animal toxicosis evaluation with less seed and land resources.

Results and Conclusions

Final data clearly showed that cultivars with NT produced none of the toxic ergot alkaloids in their forage, and the lambs grazing them gained nearly twice the weight of lambs on E+ forage and equal to those grazing E- forage. As further indication of non-toxicity,

© Copyright American Association of Bovine Practitioners; open access distribution.

lambs consuming forage with NT had serum prolactin levels similar to lambs on E- pastures. Preliminary data with beef cattle grazing Kentucky 31 tall fescue Shows weight gain of 0.69 lb. per animal per day with E+ fescue, 1.43 lb. with E- fescue and 1.73 lb. with NT fescue. Forage yield was not significantly different between the endophyte groups. Ergot alkaloid data was 0.0 for E- and NT, while E+ was 836 ppb. Blood prolactin levels for NT and E- remained normal while those for E+ were significantly reduced. This data supports differences in endophyte as a reason for differences in weight gains. In a separate summer survival study conducted in Bermuda grass sod with grazing, NT endophyte had stand survival equal to E+ and better than E-.

In conclusion, the insertion of NT endophyte into tall fescue cultivars provides better animal performance than E+ and summer survival equal to E+ tall fescue.

References

1. Bacon CW: Toxic endophyte-infected tall fescue and range grasses: historic perspectives. J Anim Sci. **73**(3): 861-70, 1995.
2. Gay N *et al*: Effects of Endophyte-Infected Tall Fescue on Beef Cow-Calf Performance. Applied Agricultural Research. **3**(4): 182-186, 1988.
3. Joost RE: Acremonium in fescue and ryegrass: Boon or Bane? A review. Anim Sci. **73**: 881-888, 1995.
4. Paterson J *et al*: The effects of fescue toxicosis on beef cattle productivity. J Anim Sci. **73**(3): 889-98, 1995.
5. Porter JK, FN Thompson Jr: Effects of fescue toxicosis on reproduction in livestock. Anim Sci, **70**(5): 1594-603, 1992.

Effect of Respiratory Disease on Weight Gain and Infrared Thermal Profiles in Feeder Cattle

M. Spire,[1] J. Drouillard,[2] J. Sargeant[1]

[1]Food Animal Health and Management Center, [2]Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS 66506

Introduction

Respiratory disease is the most costly disease of feeder cattle, and remains a major, ongoing concern for health care providers and feedlot operators. Currently, rectal temperature, feed intake, and visual appraisal are used to assess an animal's clinical condition and response to treatment. Marked physiological events associated with disease, adaptation to rations, and acute and chronic stress can modify heat loss or alter blood flow to the body surface and change metabolism in underlying muscle tissues. These changes can lead to alterations in the amount of radiant energy lost to the environment. Thermal imaging measures the amount of infrared radiation on the surface of an animal. Scanning animals with an infrared camera could detect changes in radiant energy loss associated with physiological and pathological events resulting from respiratory disease. This study evaluated the effect on performance and radiant energy loss wrought by clinical illness in feeder cattle with acute respiratory disease.

Materials and Methods

For 35 days, 224 British crossbred heifers weighing 525 lb. were evaluated daily for clinical illness. Animals were assigned a clinical score ranging from 0-4 (0=no clinical signs of respiratory disease evident, 1=mild respiratory illness, 4=moribund). Justification for therapeutic treatment for respiratory disease included a clinical score ≥1, accompanied by a rectal temperature of ≥103.5°F. All animals requiring treatment received a standard protocol for respiratory disease. Cattle were returned to their original pen following treatment. Animals identified for re-treatment had clinical scores continuing at ≥1, regardless of rectal temperature, by 48 hours after initial treatment or were observed with a clinical score ≥1, >5 days following initial treatment. Once daily on days 33-35, thermal images were obtained using a short-wavelength, infrared radiometer. Images of each animal were assigned a thermal score of 1-4 (1=coldest, indicative of low-energy loss, 4=hottest, indicative of high-energy loss). Three day average of assigned thermal scores was designated as an animal's thermal profile.

© Copyright American Association of Bovine Practitioners; open access distribution.