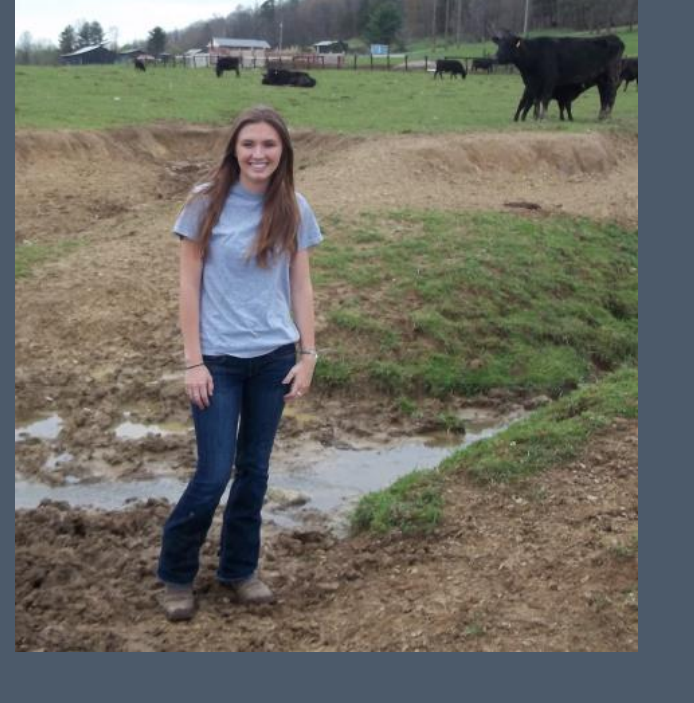


# Effect of a Hydrolyzed Yeast Product on Cow Behavior, Animal Performance, and Hair Coat Score in Cows Grazing Pastures Containing Endophyte-Infected Tall Fescue

P-30



Brandi Banks\*, Emory Sellinger\*, Johnna Scott, Taylor McMillin, Drs. Flint Harrelson and Patricia Harrelson, Mentors  
Department of Agricultural Sciences, College of Science



## ABSTRACT

The objective of this study was to determine if the addition of a hydrolyzed yeast product would alleviate the symptoms of fescue toxicosis in beef cattle. Thirty-eight Angus cow-calf pairs were stratified by cow age and body weight then randomly allotted to one of two treatments; control mineral (CON) or hydrolyzed yeast mineral (HYM). Cattle in both groups were allowed access to mineral for 126 days while they grazed the same eight pastures (1.21 hectares each) in a rotational pattern. Mineral was provided at a target rate of 4 ounces per head per day. Each pasture was grazed by cattle groups for 7 days. Mixed grass pastures containing tall fescue were utilized and evaluated for endophyte level prior to the start of the project. Due to pasture endophyte level variability (44% – 73% endophyte), both groups of cattle rotationally grazed each pasture at least 2 times starting on June 1st and ending on October 5th. Prior to entering a new pasture weekly, cows were weighed and assigned a body condition score (BCS) and hair coat score (HC) by two independent, trained personnel. Cow behavior was measured every 15 minutes within a 2 hour block weekly. Percentage of cows active or inactive, outside or inside was recorded. Data were analyzed using the MIXED procedure of SAS. Cow body weight change was unaffected by treatment ( $P > 0.23$ ). Cow BCS significantly increased in HYM vs. CON cows (0.4 vs. 0.1;  $P = 0.02$ ; SEM = 0.1) through the 126 day project. No treatment effect was observed on HC ( $P > 0.19$ ). Cow behavior was impacted by treatment, as HYM cows spent more time outside compared to CON cows ( $P < 0.01$ ). Results of this trial suggest that HYM cows may have experienced less heat stress as a result of fescue toxicosis as they were willing to spend more time outside and increased BCS.

## INTRODUCTION

Tall fescue is a predominant grass utilized for feeding beef cattle in the eastern United States. Most varieties are infected with a fungal endophyte that produces ergot alkaloids, particularly ergovaline (Realini et al., 2005). Ergovaline consumption negatively affects cattle productivity due to a series of physiological changes collectively referred to as fescue toxicosis. Effects include rough hair coat, suppressed appetite, decreased weight gain, reduced milk production and pregnancy rates, and susceptibility to heat stress causing elevated body temperature and increased salivation and respiration rate (Hoveland, 1993; Akay et al., 2004). Approaches to alleviating fescue toxicosis include both pasture and animal management (Browning, 2003). Supplementation of cattle with glucomannan, a hydrolyzed yeast derivative, has shown to mitigate fescue toxicosis effects in some cases. Various glucomannan products are available to producers. Steer calves grazing infected pasture and supplemented with FEB-200™, a glucomannan product, exhibited increased feed intake and grazing (Gunter et al., 2009). In addition, cows supplemented with the same product were also shown to have increased body weight gain (Akay et al., 2004). However, no changes in body weight gain or body condition were seen in cows supplemented with a similar product, MB-100™ (Merrell et al., 2007).

## OBJECTIVE & HYPOTHESIS

The objective of this study was to determine if the addition of a hydrolyzed yeast product would alleviate the symptoms of fescue toxicosis in beef cattle. Based on previous work, we hypothesized that the hydrolyzed yeast product would increase cow body weight (BW), improve BCS and HC, and alter cow behavior.

## MATERIALS AND METHODS

- ❖ This research was approved by the MSU Institutional Animal Care and Use Committee, 17-04-01R2
- ❖ Thirty-eight Angus cow-calf pairs (initial BW = 1224 lbs) were used
- ❖ Cows were stratified by age (3 – 12) and randomly assigned to two treatments; control mineral or hydrolyzed yeast mineral
- ❖ Minerals were provided every 28 days at a target rate of 4 oz/head/day
- ❖ Cows grazed 8 mixed-grass pastures (1.21 ha each) and were rotated every 7 days
- ❖ Weekly measures of cow BW, BCS and HCS were taken (days -1 to 126)
- ❖ Calf body weights measured at days -1, 63 and 126
- ❖ Cow behavior observed 1x/week for 2 hours, 0900 until 1100
  - ❖ Every 15 minutes, cows were observed and recorded as inactive – barn or outside, or active – barn or outside.
  - ❖ Active was determined to be eating, walking or drinking
  - ❖ Inactive was determined to be standing, lying, or ruminating
- ❖ Statistical analysis was completed using the mixed procedures of SAS

## RESULTS

Table 1. Effects of hydrolyzed yeast mineral on cow body weight, body condition score, hair coat score and calf body weight.

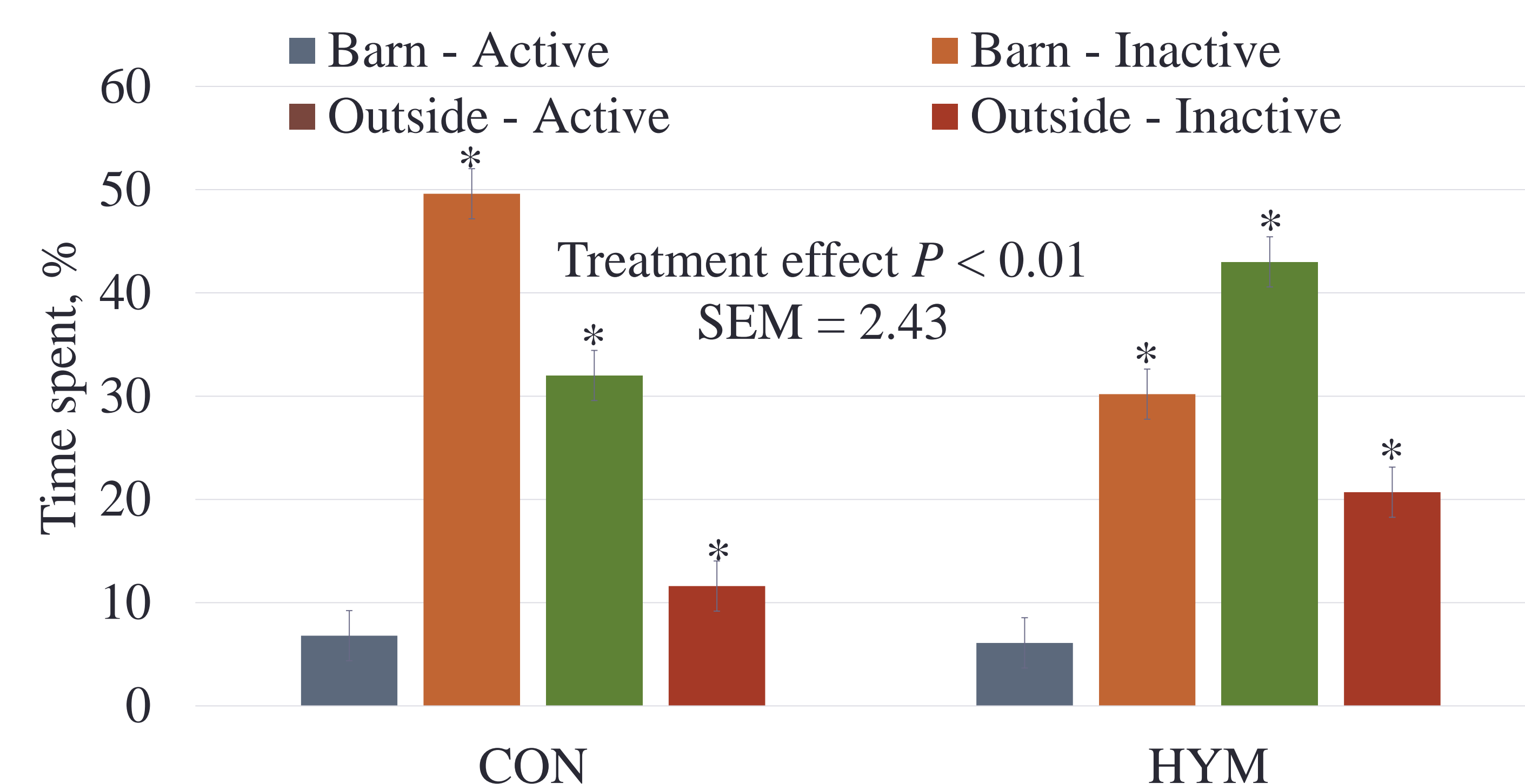
Item	CON <sup>1</sup>	HYM <sup>2</sup>	SEM	Treatment <i>P</i> -value
Cow initial BW, lbs	1208	1239	36.5	0.57
Cow final BW, lbs	1297	1321	31.9	0.60
Cow BW change	88	82	10.2	0.69
Cow BCS change	0.1	0.4	0.10	0.02
Cow HC score	1.7	1.7	0.03	0.90
Calf body weight, lbs	485	494	4.0	0.57

<sup>1</sup>CON = control

<sup>2</sup>HYM = hydrolyzed yeast mineral



Figure 1. Effects of hydrolyzed yeast mineral on cow behavior.



## DISCUSSION

Cows receiving the HYM, had improved BCS, which signifies that they were able to gain body fat. Whereas, the CON group, saw minimal changes to BCS. While we did not discover differences in cow BW, it is important to note the significant variability in cow BW across the study (over 600 pounds). Due to the variability in cow BW, changes related to treatment are difficult to produce. Therefore, BCS, is the more important measure as it relates to the nutritional status of the animal. We did observe behavioral changes between groups, as the HYM group spent more time outside compared to the CON group. This suggests that cows in the HYM group were better able to handle the possible effects of heat stress associated with fescue toxicosis by consuming the mineral additive.

## CONCLUSION

A cattle herd with the ability to remain productive is a highly valuable asset to possess. This is especially important during hot weather conditions and with the added stress of fescue toxicosis. Management strategies are typically the best course of action to alleviate the symptoms of fescue toxicosis in beef cattle. The management strategy we tested was a mineral supplement. Our hypothesis was proven as we found that cows receiving the HYM had improved BCS and spent more time outside, active. These changes will not only benefit the cows themselves, but allow the producer to make minimal changes to their production system.

## LITERATURE CITED

- Akay, V., K. A. Dawson, D. G. Ely, and D. K. Aaron. 2004. Evaluation of a carbohydrate-based absorbent for controlling intoxication associated with endophyte-infected pasture grasses. Proc. Alltech's 20th International Feed Industry Symposium.
- Browning, R. 2003. Tall fescue endophyte symbiosis in beef cattle: Clinical mode of action and potential mitigation through cattle genetics. Proc. 35th Ann. Res. Symp. and Ann. Meeting, Beef Improvement Federation. p. 28-31.
- Gunter, S., P. Beck, D. Kreider, P. Gregorini, and C. Stewart. 2009. The effects of a modified glucomannan on the performance of stocker cattle grazing endophyte-infected tall fescue. The Professional Animal Scientist. 25:300–306.
- Hoveland, C. S. 1993. Importance and economic significance of the acremonium endophytes to performance of animals and grass plant. Agriculture, Ecosystems & Environment. 44:3–12.
- Merrill, M. L., D. W. Bohnert, D. L. Harmon, A. M. Craig, and F. N. Schrick. 2007. The ability of a yeast-derived cell wall preparation to minimize the toxic effects of high-ergot alkaloid tall fescue straw in beef cattle. Journal of Animal Science. 85:2596–2605.
- Realini, C. E., S. K. Duckett, N. S. Hill, C. S. Hoveland, B. G. Lyon, J. R. Sackmann, and M. H. Gillis. 2005. Effect of endophyte type on carcass traits, meat quality, and fatty acid composition of beef cattle grazing tall fescue. Journal of Animal Science 83:430-439.

## ACKNOWLEDGEMENTS

Research was supported in part by Gro-Tec, Inc., the Morehead State University Undergraduate Research Fellowship Program, and Auburn University.

