

Grazing behaviour of beef steers grazing Kentucky 31 endophyte infected tall fescue, Q4508-AR542 novel endophyte tall fescue, and Lakota prairie grass

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Introduction Tall fescue is the most dominant grass used for pasture in the U.S. covering over 14 million ha. As a result, fescue toxicosis is a major concern among producers, especially during the summer months when the symptoms, such as reduced weight gains, are most pronounced. Producers need alternative forages for grazing cattle that do not have the negative effects associated with endophyte infected tall fescue. The objective of this experiment was to determine the grazing behaviour of cattle on Kentucky 31 endophyte infected (E+) tall fescue (*Festuca arundinacea* Schreb.), Q4508-AR542 (Q) novel endophyte tall fescue, and Lakota (L) prairie grass (*Bromus catharticus*).

Materials and methods Eighteen Angus-crossbred steers (279±8 kg) were allotted to the three different pastures (in two replicates, three steers per pasture). Twelve steers (two/pasture) were halter broken and trained to wear electronic behaviour data recorders (Rutter *et al.*, 1997; Champion *et al.*, 1997). Each pasture was 1.11 ha, equally divided into six paddocks. Paddocks were rotationally grazed for 7 d. Steers wore the device for five consecutive days in two sampling periods in June and August 2004. Recorders were placed on the animals at 0800 on d 0 and removed at 1300 on d 5, ensuring uninterrupted 24 h blocks of data recordings, which were analyzed using GRAZE (Rutter, 2000). Data were statistically analysed using SAS (SAS Institute, Cary, NC). Forage samples were taken for quality analysis just prior to entrance of the steers into the experimental paddocks.

Results Forage nutritive value among treatments was similar for June (CP, 16% ± 0.9; NDF, 56% ± 1; ADF, 31% ± 0.4), and August (CP, 14% ± 1.4; NDF 63%, ± 1.1; ADF, 35% ± 0.9). As shown in Table 1, time spent grazing in June was lowest in Q. In August, grazing time in Q was greater than E+ but similar to L. In both periods, time spent ruminating was lower in E+ than in L or Q, with ruminating time in June being greatest in Q, but Q was similar to L in August. Time spent idling (defined as time with no jaw movements) during both periods was higher in E+ compared to L, with Q similar to E+ in June, but lower than E+ in August. During the months of June and August steers grazing E+ spent less (p<0.05) time lying (515 and 564 min) than Q (737 and 697 min) and L (713 and 714 min), with Q and L being similar (p>0.05). These results are probably due to the fact that in August steers were suffering more from the effect of fescue toxicosis than in June. Higher relative humidity and temperatures in August, as well as being further into the grazing season may have exacerbated the symptoms of toxicosis, thus affecting the grazing behaviour of the steers.

Conclusions In this study, L, Q, and E+ had similar quality characteristics. However, L and Q offer benefits during summer months in terms of animal behaviour, with steers spending more time grazing and ruminating, and less time idling compared to steers grazing E+ pastures. The use of L and Q may benefit beef producers currently using E+.

References

- Champion, R.A., S.M. Rutter & P.D. Penning (1997). An automatic system to monitor lying, standing, and walking behaviour of grazing animals. *Applied Animal Behaviour Science*, 54, 291-305.
- Rutter, S.M., R.A. Champion & P.D. Penning (1997). An automatic system to record foraging behaviour in free-ranging ruminants. *Applied Animal Behaviour Science*, 54, 185-195.
- Rutter, S.M. (2000). GRAZE: A program to analyze recordings of the jaw movements of ruminants. *Behaviour Research Methods, Instruments & Computers*, 32, 86-92.

Table 1 Daily activities of steers grazing different forages (min)

Period	Activity	Treatment ¹			s.e.m.
		E+	L	Q	
June	Grazing	594 ^a	634 ^a	559 ^b	8.05
	Ruminating	525 ^c	568 ^b	616 ^a	7.85
	Idling	325 ^a	226 ^b	279 ^a	9.10
August	Grazing	547 ^b	673 ^a	623 ^a	10.14
	Ruminating	514 ^b	606 ^a	606 ^a	4.13
	Idling	401 ^a	182 ^c	280 ^b	11.75

¹E+=endophyte infected tall fescue; L=Lakota prairie grass; Q=Q4508-AR542 tall fescue

^{abc}Means within row with different superscripts differ (p<0.05)