

Performance of sheep grazing tall fescue cultivars containing non-ergovaline producing *Epichloë* endophytes

James THOMPSON¹, Tom NICHOLS¹ and Steven REID^{2*}

¹Department of Animal Science, College of Agricultural Science, Oregon State University, Corvallis, Oregon, USA

²DLF USA Inc., Albany, Oregon, USA

*Corresponding author: steve.reid@dlf.com

Fescue toxicosis is one of the costliest animal disorders facing the livestock industry in the eastern United States, affecting over 8.5 million cattle and costing the United States beef industry nearly US \$2 billion annually in lost revenue due to reduced reproductive and growth rates in cattle herds. A study was conducted to determine the effects of tall fescue (*Festuca arundinacea* Schreb.) containing wild-type ergovaline producing endophyte (Kentucky 31), tall fescue cultivars containing non-ergovaline producing endophyte strains (Martin 2 PROTEK, Martin 2 ISO 207, Duramax Gold), and endophyte-free tall fescue cultivars (Martin 2, Au Triumph). Three Polypay yearling ewes were assigned to one of 6 different pasture treatments containing either ergovaline producing endophyte, non-ergovaline producing endophyte or endophyte-free cultivars in 0.1 hectare replicated pasture treatments. The 36 ewes were evaluated for changes in body weight, serum prolactin, and rectal temperatures during three grazing periods over three years (2009 to 2011) to determine animal performance and evaluate fescue toxicosis. The nutritional quality of endophyte-infected tall fescue was shown to be comparable to other tall fescues that did not contain *Epichloë* spp. Ergovaline was only detected in the Kentucky 31 forage, when sampled during each year

of each grazing period (139 ppm). Pre-treatment sheep body weight did not differ among treatments. Mean total weight gain ($P=0.0039$) and mean average daily gain ($P=0.0026$) was lower for Kentucky 31 compared to all other treatments. Pre-treatment serum prolactin concentration did not differ among treatments. Post-treatment prolactin level showed a highly significant effect in the 3-year mean ($P<0.0001$). Serum prolactin concentrations in sheep consuming Kentucky 31 were lower than those in sheep consuming tall fescue cultivars infected with non-ergovaline producing endophytes. No differences in rectal temperatures were observed, either pre-treatment, treatment, or post-treatment. However, rectal temperature measurements can be subjected to confounding variables, such as sheep handling stress, and ambient air temperature. Sheep grazing tall fescue cultivars infected with non-ergovaline producing endophytes exhibited total weight gains similar to sheep consuming endophyte-free tall fescue cultivars. Lowered prolactin concentration and depressed weight gain of sheep grazing Kentucky 31 indicates that the use of non-ergovaline producing endophytes within tall fescue cultivars is a viable management strategy for minimizing the effects of tall fescue toxicosis.