

Stephanie Raney, Animal Science and Psychology

Year in School: Junior

Hometown: Sikeston, MO

Faculty Mentor: Dr. Donald E. Spiers, Animal Sciences

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A feed-restriction model to identify factors responsible for fescue toxicosis-induced reduction in food intake

Stephanie Raney, Peggy Ann Eichen, & Donald Spiers

Fescue toxicosis results from intake of ergopeptine alkaloids derived from a fungus (*Neotyphodium coenophialum*) in tall fescue, and produces reduced productivity. Contributors to this reduction are decreased feed intake and growth. There have been few attempts to characterize these changes. A study was conducted to develop a model for this component using rats in a feed restriction experiment described previously by others. Each animal was trained over a minimum 11 d period to eat their entire daily ration from 1300-1500. This allows one to evaluate the effect of potential treatments more precisely by using a 2 hours rather than 24. Group I animals were first fed in this order an endophyte-free seed (E-) diet (ad libitum), a restricted E- diet, a restricted endophyte-infected seed (E+) diet, and lastly an E- diet (ad libitum). There was no decrease in feed intake ($\alpha; = 0.05$) from restricted E- to restricted E+ diets, but reduced growth while on E+ diet. Return to E- diet restored growth. A different routine was used with Group II. Rats were first fed ground commercial diet (ad libitum), followed by restricted ground diet, restricted E- diet, and lastly restricted E+ diet. Initial exposure to restricted diet decreased feed intake and growth ($\alpha; = 0.05$), followed by partial recovery or adaptation over following 4 days. Shift to restricted E- produced no change in feed intake and a greater return of growth. Restricted E+ diet intake reduced feed intake and growth within 24 hours ($\alpha; = 0.05$). This reduction was stable over the entire 2 week period. These responses agree with previous studies using long-term ad libitum E+ treatment. This new model can now be used to identify mechanisms for fescue toxicosis-induced reduction in feed intake and growth, and develop potential treatments.