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Select Immune Response in Beef Calves Grazing Endophyte-infected Tall Fescue

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Copper status and immune response of weaned beef steers that grazed endophyte-infected (*Acremonium coenophialum*, *Morgan Jones and Gams*) tall fescue (*Festuca arundinacea* Schreb.) was evaluated in a 6 month, bi-location study (Ridge-Valley [R-V] and Southern Piedmont [SP] regions of Virginia). Forty-two steers were blocked by weight and breed to: 1) endophyte-infected (EI) fescue and 2) endophyte-free (EF) fescue pastures at the two locations. Plasma Cu concentrations were higher in steers grazing EF fescue at both study sites (R-V, $P < 0.01$ and SP, $P < 0.05$) compared to those grazing EI tall fescue. Ceruloplasmin oxidase activity was increased ($P < 0.01$) in steers that grazed EF versus EI fescue at the R-V site. Immune status was measured as total leukocyte count and monocyte cell activity. Steers grazing infected fescue had lower

($P < 0.01$) leukocyte counts compared to steers on non-infected fescue. Phagocytic activity and MHC class II antigen expression of monocytes from steers grazing EI fescue at the R-V site was lower ($P < 0.05$) compared to EF steers. Monocytes from EF steers at the SP study site were more responsive (MHC antigen expression, $P < 0.001$ and hydrogen peroxide release, $P < 0.05$) compared to monocyte activity of EI steers. Steers grazing EI fescue had lower body weights ($P < 0.05$) and body condition ($P < 0.001$), rougher hair coats ($P < 0.001$), and greater incidence of facial warts, nasal and ocular discharge ($P < 0.05$) compared to the EF groups at the end of the grazing period. These data suggest a relationship may exist between endophyte infection and Cu status in regard to immune function in growing steers.