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Effects of fescue toxicosis on growth and thermoregulation of rats

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An endophytic fungus (*Neotyphodium coenophialum*) grows between the cells of most tall fescue plants. Research has shown that endophyte can produce ergot alkaloid toxins under certain conditions. Consumption of these toxins by animals causes a condition commonly known as "fescue toxicosis", which can result in decreased weight gain, milk production, conception, serum prolactin, and ability to dissipate body heat. In this study, sixteen rats were randomly assigned to different treatment groups. The different groups consisted of endophyte-infected (E+) diet, endophyte-free (E-) diet and E+ and E- pair fed diets. The two pair fed groups was given diet based on the amount of diet eaten and the weight of the E+ and E- groups. E+ diets contained 91.5µg of ergovaline, the primary toxin in E+ seed. Body weight, water intake, and feed intake were recorded daily. The rats were also stocks trained during this period for the determination of thermoregulation at the end of the study. After approximately 36 days of treatment, the rats were tested to determine their response to cold (12 °C) and warm (33 °C) temperatures. Rats were only exposed to thermal challenge during each test session, with each session averaging four hours. Each rat received the opposite thermal challenge on alternate days. Sessions began by placing rats in Plexiglas stocks and attaching forty gauge thermocouple wires with collodion, for tail and rectal measurements. Animals were placed in Plexiglas cylinders within the metabolic chamber and equilibrated to thermoneutral conditions (22 °C) for one hour prior to measurement of their thermoregulatory ability. Metabolic rates were determined using an open flow system. Air passed through each cylinder at a flow rate of 560 ml/min and a sample recorded for analysis of percent oxygen content using a Qubit. Once thermoneutral, rats were exposed to cold or warm conditions for a minimum of one hour, followed by recording MR, rectal, tail, and ambient temperatures. Results show that the feed intake of E+ is reduced compared to E-. Body weight of E+ rats is also reduced compared to that of the E- rats. Results of the metabolic rates are still be conducted.

