

4500 treatment group ($NC = 100.0 \pm 0.0\%$, $400 = 54.4 \pm 8.6\%$, $900 = 75.0 \pm 7.1\%$, and $4500 = 97.9 \pm 2.8\%$; $P < 0.05$). Centrifugation at 400 or $900 \times g$ did not damage equine sperm. Further studies of centrifugation forces between 900 and $4500 \times g$ are warranted to find optimal forces that maximize recovery rate, minimize sperm damage and do not affect fertility.

Keywords: Centrifugation; Spermatozoa; Plasma membrane; Acrosome; Recovery rate

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Serum concentrations of ergovaline/ergot alkaloids in late-term pregnant mares grazing endophyte-infected tall fescue pastures: A preliminary report

A.F. Lehner^a, B.P. Fitzgerald^a, C.G. Hughes^a, T. Tobin^a, F.C. Camargo^b, J. May^c, L. Dirikolu^d, D.L. Christiansen^e, P.L. Ryan^e

^aDepartment of Veterinary Sciences, University of Kentucky, Lexington, KY, USA

^bDepartment of Animal Sciences, University of Kentucky, Lexington, KY, USA

^cEnvironmental Research Training Laboratory, University of Kentucky, Lexington, KY, USA

^dDepartment of Veterinary Biosciences, University of Illinois, Urbana, IL, USA

^eDepartment of Pathobiology and Population Medicine, Mississippi State University, Mississippi State, MS, USA

Ergot alkaloid toxicities such as tall fescue toxicosis from *Neotyphodium coenophialum*-endophyte-infected [E+] tall fescue pastures are important veterinary and economic problems. Tall fescue toxicosis apparently results from ingestion of vasoconstrictive ergot alkaloids produced by symbiotic fungal endophytes; ergovaline is generally considered the critical toxin. To date, ELISA and HPLC with UV/fluorescence detection have been the predominant means of ergot alkaloid determination. These techniques, however, lacked sufficient sensitivity and/or specificity, to detect serum concentrations of specific ergot alkaloids. Thus, the objective of this study was to employ highly sensitive analytical techniques that included the application of liquid-liquid extraction, HPLC and Electrospray(+) ionization mass spectrometry (ESI-MS) with multiple reaction monitoring (MRM), to detect specific ergot alkaloids in equine serum with a limit of detection estimated at 1 pg/mL . To this end, weekly blood samples were collected by venipuncture from late-term pregnant mares ($>290 \text{ d}$) exposed to toxic endophyte-infected ($>90\%$ contaminated) tall

fescue pastures. Serum samples were analysed from four mares that showed clinical signs of ergot alkaloid reproductive toxicity (i.e., agalactia, prolonged gestation, placental thickening, mare and neonatal mortality). We now report that serum concentrations of ergovaline in mares grazing E+ tall fescue pastures ranged from 0.7 to 3.8 pg/mL , and its 8-positon epimer ergovalinine, from 1.5 to 5.5 pg/mL . Conversely, concentrations of ergocryptine and its epimer, ergocryptinine, ranged from 1.2 to 6.8 pg/mL and 2.2 to 7.5 pg/mL , respectively. These very low serum concentrations of ergovaline were consistent with a relatively small daily dose (approximately 1 mg/d on E+ pastures), and with ergovaline being an exceptionally potent xenobiotic/toxin. However, it is likely that these serum samples also contained an apparent mixture of ergot-related compounds, each of which may contribute to the overall clinical fescue toxicosis syndrome, and the specific identification of which will require broadening the scope of this highly sensitive and specific analytical method.

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Keywords: Equine; Fescue toxicosis; Endophyte-positive; Ergovaline; Ergovalinine

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Safety and efficacy against uterine infections of an equine in-tranasal *Salmonella* vector vaccine

R.C. Causey^a, S.C. Artiushin^b, I.F. Crowley^a, A.D. Homola^a, A. Kelley^a, J.A. Weber^a, H.M. Opitz^a, L.A. Stephenson^a, S. Guilmain^a, J.F. Timoney^b

^aDepartment of Animal and Veterinary Sciences and the Maine Agriculture and Forestry Experiment Station, University of Maine, Orono, ME, USA

^bGluck Equine Research Center, Department of Veterinary Science, University of Kentucky, Lexington, KY, USA

Attenuated *Salmonella enterica* serotype Typhimurium (*S. typhimurium*), expressing the SzP protective protein of the MB 9 serovar of *Streptococcus zooepidemicus* (SzP-MB9) was tested for its safety and efficacy as a vaccine against streptococcal uterine infections in mares. A laboratory-prepared $\Delta cya \Delta crp$ -*pabA* mutant, attenuated strain of *S. typhimurium* (MGN 707), originally isolated from a case of equine