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JOURNAL ARTICLE

Dose-response effects of gonadotropin-releasing hormone on plasma concentrations of gonadotropins and testosterone in fertile and subfertile stallions

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Five fertile and five subfertile stallions were treated with a single intravenous injection of saline the first week followed by a single intravenous injection of varying doses of gonadotropin-releasing hormone (5, 10, 25, 100, 500 micrograms) given in a randomized fashion over the next 5 weeks during the nonbreeding season. Blood samples were collected periodically before and after treatment for analysis of luteinizing hormone, follicle stimulating hormone, and testosterone content by radioimmunoassay. Before treatment, semen samples were collected every other day for 3 weeks for analysis of volume, concentration, motility, pH, and morphology. Basal plasma levels of luteinizing hormone were higher ($P < 0.05$) in the subfertile group, follicle stimulating hormone levels tended to be higher ($P < 0.10$) in the subfertile group, and testosterone levels were similar in the two groups. A significant linear-log dose-response relationship was observed for plasma luteinizing hormone ($P < 0.05$) and follicle stimulating hormone ($P < 0.05$) to exogenous gonadotropin-releasing hormone in both the fertile and subfertile group. A linear-log dose-response relationship was also observed for plasma testosterone ($P < 0.05$) in the fertile group. The magnitude of the luteinizing hormone and follicle stimulating hormone response to gonadotropin-releasing hormone across doses was similar in both groups of stallions. A significant testosterone response to gonadotropin-releasing hormone in the subfertile group of stallions was not observed ($P > 0.05$). Mean testosterone concentrations after treatment in terms of net increase and percent of baseline were significantly lower ($P < 0.05$) in the subfertile group compared to the fertile group. (ABSTRACT TRUNCATED AT 250 WORDS)