219 FOLLICLE AND HORMONE DYNAMICS IN SINGLE- *v.* DOUBLE-OVULATING HEIFERS

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Abstract

The present experiment used the Day 4 ablation model for increasing the incidence of double ovulations in heifers. The objective was to compare follicle growth and plasma hormone concentrations associated with single *v.* double ovulations. Follicles ≥5 mm were ablated at 4 days post-ovulation to induce a prominent FSH surge and a new follicular wave, and 2 injections of PGF2 (12 h apart) were given 2 days later (Day 6) to favor ovulation. Beginning on Day 5, the 3 largest follicles of the induced wave were scanned twice a day until 36 h after the next ovulation. Blood samples were taken at 6-h intervals starting when the largest follicle reached ≥8.0 mm (expected deviation at 8.5 mm; Ginther et al. 1996) and continued until 36 h after the next ovulation. Concentrations of LH and FSH were measured by validated RIA for cattle (LH measured by Ginther et al. 1999; FSH measured by Adams et al. 1992) and concentrations of oestradiol measured by a commercially available RIA kit (Siddiqui et al. 2009). From a total of 31 heifers, 16 %) or 15 (48%) developed a single or more than 1 dominant (≥ 10 mm) follicle in the follicular wave after ablation, respectively. For heifers with 2 dominant follicles, the second-largest follicle ovulated in 9 (60%) heifers and the overall double ovulation rate was 29% (9/31). Follicle diameters and plasma hormone concentrations were compared between single ovulators (n = 12) and double ovulators (n = 8). Diameter of the preovulatory follicles did not increase between the LH peak and ovulation in either the single or double ovulations. In double ovulators, the interval from follicle deviation to the peak of the preovulatory LH surge was shorter (1.9 ± 0.2 days *v.* 2.5 ± 0.2 days; $P < 0.02$) and the diameter of the largest preovulatory follicle was smaller (12.2 ± 0.5 mm *v.* 13.3 ± 0.3 mm; $P < 0.02$) than in single ovulators, respectively. The LH concentrations of the preovulatory surge did not differ between single and double ovulators for 24 h on each side of the peak (main effect of hour only; $P < 0.0001$). When data were normalized to the LH peak, the peak of the preovulatory FSH and estradiol surges occurred in synchrony with the peak of LH surge for both groups. A group effect ($P < 0.0001$) for FSH resulted from a lower concentration averaged over hours in double ovulators. Estradiol showed a group by hour interaction ($P < 0.008$), reflecting greater concentrations in the double ovulators before and at peak. In conclusion, an increased

Supported by the Eutheria Foundation, Cross Plains, WI, USA. Submission supported by FAPEMIG.

Reproduction, Fertility and Development 22(1) 267–267 doi:10.1071/RDv22n1Ab219
Published: 08 December 2009

Reproduction, Fertility and Development

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