Effect of short- versus long-proestrus on fertility in beef cattle after fixed-time artificial insemination

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The effect of changing the plasma progesterone concentration and duration of proestrus during growth of dominant follicle on fertility in beef cattle following fixed-time artificial insemination was determined. Heifers (n=61) and postpartum beef cows (n=80) were assigned randomly to four groups: high progesterone-long proestrus (HL), high progesterone-short proestrus (HS), low progesterone-long proestrus (LL) and low progesterone-short proestrus (LS). Cattle received two doses of prostaglandin F2α (PGF) 11 days apart, followed by estradiol-17β, progesterone along with a once-used CIDR device placed in vagina nine days later (Day 0). At the same time (Day 0), LL & LS groups were given two doses of PGF 12 h apart, while, HL & HS groups were allowed to retain the corpus luteum (CL). At CIDR removal on Day 7 (HL, LL) or Day 8 (HS, LS) cattle received PGF and pLH 12 h later to induce ovulation. Artificial insemination (AI) was done 12 h after the pLH injection. Low progesterone and long proestrus resulted in higher pregnancy rates (P<0.023; 54.0%, 38.2%, 46.4% and 12.2%, in LL, LS, HL and HS groups, respectively). There was no interaction between levels of progesterone and duration of proestrus (P=0.12) and the pattern was similar in cows and heifers (P=0.47). In conclusion, a short proestrous interval resulted in a reduced pregnancy rate following fixed-time AI in beef cattle. Although a low progesterone environment during growth of the ovulatory follicle increased ovulatory follicle size and subsequent CL size and function, it did not compensate for the effect of shortened proestrus on pregnancy rates.

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