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Influence of body condition score and lactation status on oestrus response and pregnancy rate in dairy and beef cows inseminated with sex-sorted or non-sex-sorted semen

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Oestrous synchronization and artificial insemination (AI) are two advanced reproductive technologies that dairy and beef cattle productions are increasingly using to enhance their herds' reproductive performance. However, oestrus synchronization can be influenced by many intrinsic and extrinsic factors. Therefore, the objectives of this study were to compare the effects of body condition score (BCS) and lactation status on oestrus response rate and pregnancy rates of dairy and beef cows submitted to timed artificial insemination (TAI) with sex-sorted or non-sex-sorted semen. For this study 231 cows (dairy; n = 134 and beef; n = 97) with BCS of ≤2.5, 3 and ≥3.5 (scale 1: emaciated to 5: obese), lactating or dry and at 90 days postpartum were used. On any given day throughout the oestrous cycle (Day 0) the cows received a controlled intravaginal drug release (CIDR®, Pfizer Laboratories) device, with 2 mL intramuscular (i.m.) of estradiol benzoate® (EB; VTech). On Day 5, 2.5 mL i.m. of pregnant mare serum gonadotrophin (Chronogest[®], Intervet International B.V.). On Day 8, 2 mL i.m. of prostaglandin F₃α (PGF₂α) (Estrumate[®], Intervet, South Africa), with adhesive tail-head heat mount detectors (HMD) (Kamar[®], USA) and CIDR[®] was removal. On Day 9, 1 mL i.m. of EB. TAI was performed by the same inseminator 55 hours following CIDR® removal using frozen-thawed X-sorted or non-sex sorted semen from eight sires (4 Holstein Friesian and 4 Angus). At Al, oestrus behaviour was assessed by activation of the HMD colour either as are red (oestrus/activated patch) or white (no oestrus/ not activated patch). Pregnancy diagnosis was performed 95 days following TAI using transrectal ultrasound scanner (5.0- MHz linear transducer; Ibex pro™, USA). Chi-square test was used to compare the proportion of oestrus response and pregnancy. The model included sires as a fixed effect. The proportion of oestrus response by BCS of \leq 2.5 (79.0%), 3 (89.0%) and \geq 3.5 (92.6%) were higher in dairy cows as compared to \leq 2.5 (68.4%), 3 (61.1%) and \geq 3.5 (70.8%) beef cows (P< 0.05). Lactating (86.2%) and dry (81.5%) dairy cows had higher oestrus responses, compared to beef lactating (67.7%) and dry (59.4%) cows (P< 0.05). The proportion of pregnancy was higher in BCS ≥3.5 in dairy (64.3%) cows compared to beef (40.0%) cows inseminated with non-sex-sorted semen (P< 0.05). However, BCS of 3 on beef cows had higher (41.9%) pregnancy rate compared to dairy (31.6%) cows inseminated with sex-sorted semen. Lactating dairy cows inseminated with sex-sorted (42.5%) or non-sexsorted (50.0%) semen, had higher pregnancy rate compared to beef (sex-sorted; 31.2% and non-sex-sorted; 34.4%) (P< 0.05). However, pregnancy rate in dry cows was higher in beef (sex-sorted; 47.4% and non-sex-sorted 46.1%) cows compared to dairy (sex-sorted; 36.4% and non-sex-sorted; 36.4%) (P< 0.05). In conclusion, BCS and lactation status of dairy and beef cows do affect negatively on oestrus response and pregnancy rate.

Keywords: synchronization, pregnancy, cattle