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Title of thesis: Evaluation of ovulation time following estrus synchronization with intravaginal progesterone devices in ewes carried FecB gene compared to ewes without gene and conception rate following laparoscopic insemination during breeding season

ABSTRACT

The ovarian responses concerning types of vaginal devices in adult ewes carrying the Booroola fecundity gene (FecB) were not studied in detail. The current study was conducted to evaluate the ovulatory responses and distributions following estrus synchronization with endogenous (CIDR) or exogenous (sponge) vaginal progesterone devices in pluriparous fat-tailed Qezel ewes carrying FecB (as heterozygous; B+) compared to non-carriers, and reproductive indices after fixed time laparoscopic insemination (FTLI). Estrus was synchronized using CIDR (n=16; 6 FecB carriers and ten non-carriers) or vaginal sponge (n=15; 7 FecB carriers and eight non-carriers) insertion in ewes (Day -14) for 14 days, and eCG (400 IU) injection at device removal (Day 0). FTLI was performed at 57 ± 0.5 h and 64 ± 0.5 h after eCG administration in CIDR and sponge-treated ewes, respectively. Ovarian structures were measured using a transvaginal probe (9 MHz) at -14, 0, and 24-26, 36-38 h, 48-51 h, and continued every 4 hours until 75 h after eCG treatment. Progesterone concentrations were measured in sera samples collected at -14, 0, +2, and +11 during experiment. The initiation and termination of ovulations were earlier in CIDR-received ewes and FecB carriers compared to sponge-treated and non-carrier ewes, respectively ($P < 0.05$). Progesterone concentrations were higher in CIDR received group compared to sponge-treated ewes at day 0 (3.31 ± 0.32 vs. 0.38 ± 0.04 ng/ml; $P < 0.001$). Device types did not affect the sizes of ovulatory follicles, corpora lutea diameters, and reproductive indices ($P > 0.05$). Despite the smaller sizes of ovulatory follicles and corpora lutea in FecB carriers, the twinning rate, litter size, and reproductive rate were greater compared to non-carrier ewes ($P < 0.05$). In conclusion, ovulation synchronization with vaginal sponges containing medroxyprogesterone acetate + eCG, delayed the ovulation in ewes, but did not influence the conception rate compared to CIDR-treated ewes. In spite of the smaller sizes of the ovulatory follicles and subsequent corpora lutea, higher reproductive outcomes were acquired in the FecB carriers compared to non-carrier fat-tailed ewes following FTLI.

Keywords: *FecB* gene; Vaginal sponge, CIDR; Ovulation distribution; Laparoscopic insemination.