

PROGESTERONE LEVELS IN GOATS USING CIDR[®]'S AS PART OF AN ESTROUS SYNCHRONIZATION, SUPEROVULATION PROTOCOL DURING THE BREEDING SEASON

S. Ayres¹, M. Kumar¹, N. Buzzell², Q. Zhang¹, K. Baldwin¹, W. Gavin²

¹Tufts University School of Veterinary Medicine, North Grafton, MA, USA,

²GTC Biotherapeutics, Framingham, MA, USA

The objective was to determine the levels of progesterone produced with CIDR[®]'s during estrus synchronization and superovulation in goats, compared to levels produced during the natural estrous cycle, and whether these levels could be related to the superovulation response. The progesterone levels were also compared to previous data from does cycled with CIDR[®]'s during anestrus.

Seventeen experimental and ten control animals were used. The experimental does received the following estrous synchronization, superovulation protocol, Day 0: insertion of CIDR[®] (Eazi-Breed CIDR[®], Pharmacia & Upjohn, 0.3 g progesterone), Day 7: 50 mg PGF_{2α} (Lutalyse, Upjohn, 50 mg/ml), Days 12–15: 256 mg follicle stimulating hormone (Folltropin-V, Bioniche Animal Health, 400 mg/20 ml), Day 14: CIDR[®] pulled, Day 16: 50 mcg GnRH (Cystorelin, Abbott Labs, 50 mcg/ml), Day 17: oocytes surgically collected. Control does did not receive any treatments. Blood was collected daily from Days 2 or 3 to Day 17. Progesterone levels were determined using a solid-phase radioimmunoassay assay (Coat-A-Count Progesterone Kit, Diagnostics Products Corporation).

Fifteen of the 17 does displayed estrus behavior and underwent surgery for oocyte collection. Of these 15 animals, 11 exhibited progesterone levels that peaked on the day of CIDR[®] insertion (average: 5.9 ng/ml, range 3.6–10.3) and gradually decreased to an average level of less than 3 ng/ml by Day 8, similar to levels produced by CIDR[®]'s during anestrus. All of these animals exhibited good levels of superovulation (average: 21.4 ovulations, range 8–35). One additional animal had low progesterone that peaked on Day 2 (3.8 ng/ml) and exhibited an ovulation rate of 12. Thus, 11 of 15 does (73.3%) exhibited relatively low levels of progesterone during the regime. This contrasts with controls where only 2 out of 10 does (20%) exhibited low progesterone levels throughout the collection period. Three experimental animals exhibited high levels of progesterone during synchronization (peak range: 10.0, 12.9 and 14.8 ng/ml). Of these animals, one doe exhibited a good ovulation rate (10), while the other two does exhibited poor ovulation rates (2 and 0). The animals that responded poorly had low levels of progesterone prior to CIDR[®] insertion (<3.3 ng/ml) while the animal that responded well, had a higher level of progesterone prior to CIDR[®] insertion (5.9 ng/ml), suggesting that the CIDR[®] was inserted at a different day of the normal estrous cycle.

In conclusion, during the breeding season, many goats synchronized with CIDR[®]'s exhibited low levels of progesterone, yet were successfully synchronized and super-ovulated. That the majority of goats showed no indication of endogenous progesterone during the CIDR[®] regime and the quality of oocytes produced under low and high progesterone regimes require further study.

Keywords: Goats; Progesterone; CIDR[®]; Superovulation; Estrous synchronization