

PROGESTERONE LEVELS IN ANESTROUS GOATS RECEIVING CIDR[®]S AS PART OF AN ESTROUS SYNCHRONIZATION, SUPEROVULATION PROTOCOL

S. Ayres¹, M. Kumar¹, Q. Zhang¹, K. Baldwin, L. Vaught, W. Gavin², M.O'Coin¹, E. Memili², E. Behboodi¹

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

²GTC Biotherapeutics, Framingham, MA

Progesterone is an important part of estrous synchronization and superovulation protocols used in goats, particularly during transition and anestrus when endogenous progesterone production is low. During the breeding season, progesterone levels in cycling goats have been reported to average over 6 ng/ml for 11-12 days. High progesterone levels prevent the luteinizing hormone surge, and inhibit the formation of dominant follicles. We have observed irregular heats, cystic follicles, and dominant follicles when using CIDR[®]s as the source of progesterone in protocols during transition. It was hypothesized that these problems might occur if relatively low amounts of progesterone were being produced by the CIDR[®]s. The aim of this study was to measure the amount of serum progesterone produced by CIDR[®]s during a standard estrous synchronization and superovulation protocol. In order to measure only the exogenous source of progesterone, the study was conducted during anestrus.

Twelve experimental and four 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: 5 mg PGF_{2α} (Lutalyse, Upjohn, 50 mg/ml); Day 12-15: 256 mg follicle stimulating hormone (Folltropin-V, Bioniche Animal Health, 400 mg/20 ml); Day 14: CIDR[®] pulled; Day 17: oocytes surgically collected. The control does received the same protocol minus insertion of a CIDR[®]. Heats were checked, and blood was collected daily. Progesterone levels were determined using a solid-phase radioimmunoassay progesterone test (Coat-A-Count Progesterone kit, Diagnostics Products Corporation).

Average levels of progesterone were highest on the first day after CIDR[®] insertion and dropped steadily thereafter. At no time were average levels greater than 5.89 ng/ml. By Day 9 after CIDR[®]

		Day -1	Day 1	Day 4	Day 7	Day 10	Day 13	Day 16
P4 does	n=12	0.05	5.89*	5.09*	4.89*	3.67*	2.93*	0.07
Controls	n=4	0.03	0.19	0.03	0.02	0.06	0.26	0.04

* P<0.000001, Student T test, 2-tailed, unequal variance. Progesterone levels in ng/ml

insertion, the average progesterone level had dropped to less than 4 ng/ml. Three experimental does exhibited cystic follicles or irregular heats. These animals had low peak progesterone levels and/or irregular progesterone levels.

This study indicates that average progesterone levels produced by CIDR[®]s in anestrus goats are lower than average progesterone levels produced by corpora lutea in goats naturally during the breeding season. Levels of progesterone produced by CIDR[®]s during anestrus, and the pattern of increasing and decreasing progesterone levels may impact the development of cystic follicles as well as contributing to irregular heats seen during the protocol. This may be of particular importance during transition, when the combination of premature luteal regression with dropping or low progesterone from CIDR[®]s may lead to low or irregular levels of progesterone during synchronization and superovulation protocols.

Key words: goats, progesterone, CIDR, superovulation, estrous synchronization