

COMPARISON OF SUPEROVULATION PROTOCOLS IN GOATS USING FSH WITH OR WITHOUT EXOGENOUS PROGESTERONE

S.L. Ayres¹, K. Baldwin¹, L. Vaught¹, M. O'Coin², E. Memili², E. Behboodi²

¹Tufts University School of Veterinary Medicine, North Grafton, MA 01536

²GTC Biotherapeutics, Inc., Framingham, MA 01701

Traditionally, superovulation protocols in small ruminants have relied upon the use of progesterone in combination with follicle stimulating hormone (FSH) and prostaglandin F2 alpha (PGF_{2α}). Exogenous progesterone is used to replace or supplement the progesterone normally produced by the corpora lutea during diestrus. It also inhibits the growth of dominant follicles. By controlling the removal of the exogenous progesterone source, precise timing of the progesterone drop and subsequent estrus can be achieved. Commonly used sources of exogenous progesterone for small ruminants include vaginal sponges, vaginal controlled internal drug releasing devices (CIDR[®]'s), and ear implants. Currently, none of these products are available to producers in the United States. To address this issue, a superovulation protocol was developed that did not need an exogenous progesterone source, but rather took advantage of the animal's endogenous progesterone production. This study was designed to test the effectiveness of this superovulation scheme without exogenous progesterone compared to a known superovulation regimen using CIDR[®]'s (Eazi-Breed[™], Pharmacia) as the source of progesterone.

Forty alpine does ranging in age from 1 year to 4 years were used in this study. Half of the does were cycled with a superovulation protocol using CIDR[®]'s (+CIDR), while the other does were cycled with a protocol that did not use exogenous progesterone (-CIDR). Does were divided into 10 surgery groups, each containing 2 +CIDR and 2 -CIDR does. For the +CIDR groups, does were injected with PGF_{2α} (Lutalyse, Upjohn) on Day -7. A CIDR was inserted into the vagina of the doe at Day 0. PGF_{2α} was given on Day 7. The CIDR was removed on Day 14. A total of 256 mg of FSH (Folltropin-V, VetrepHarm) was given in 8 doses over 4 days starting on Day 12. GnRH (Cystorelin, Merial) was administered on Day 16. Surgery to collect early ova was performed on the morning of Day 17. The reproductive tract was exposed via a small ventral laparotomy. Follicles and ovulation points were counted. Ova were flushed from the uterine tube, counted, and evaluated. In the -CIDR groups, heat checks were performed to select does that would be approximately 7 days (range: 6 to 9 days) from estrus when the first dose of FSH was administered. The FSH delivery and remainder of the protocol were identical to that of the +CIDR group, except that PGF_{2α} was administered to the -CIDR group at the same time that CIDR's were removed in the +CIDR group.

There was no significant difference ($P>0.05$) in the average numbers of follicles (+CIDR: 5.35, -CIDR: 5.85) and ovulation points (+CIDR: 13.8, -CIDR: 13.05) observed, nor in the number of ova collected (+CIDR: 9.70, -CIDR: 9.65). In conclusion, if estrus can be determined, superovulation can be reliably produced in goats without the need for an exogenous source of progesterone.

Key words: goat, superovulation, estrus synchronization, progesterone, FSH