

## RESEARCH NOTE

### THE OESTROUS RESPONSE AND CHANGES IN PLASMA PROGESTERONE CONCENTRATIONS OF ANGORA AND BOERGOAT DOES FOLLOWING INJECTION OF A GnRh ANALOGUE

*Receipt of MS 18-09-1978*

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It has now been adequately documented that Gonadotrophin releasing hormone (GnRh) induces the release of LH in many species (Seeger & Humke, 1975). In anoestrous sheep administration of GnRh results in ovulation, but the resultant corpus luteum is usually non viable and non functional (Haresign, Foster, Haynes, Crighton & Lamming, 1975). In goats GnRh administration also stimulates the release of LH (Van der Westhuysen, unpublished data) but its practical application has not been studied.

A small proportion of Angora goat does may show oestrus as early as January or February, but the active breeding season of the Angora is from April to August (Marincowitz, 1962). It is often of practical importance to breed Angora goat does prior to the onset of the active breeding season and for this reason the induction of breeding activity with the intravaginal progestogen sponge/PMS technique has been previously investigated (Pretorius & Van der Westhuysen, 1971; Van der Westhuysen, 1976).

Boergoat does are also seasonally polyoestrous with the peak of their sexual activity from April to May (Kupfer, 1928; Van Rensburg, 1964; Hofmeyr, Joubert, Badenhorst & Steyn, 1965; 1966). In this breed, it has been found that the presence of the ram during anoestrus (October/November) is a sufficient stimulus to induce oestrus and that the use of hormones is unnecessary (Skinner & Hofmeyr, 1969). However, the stimulation of the onset of pituitary and ovarian activity towards the end of anoestrus with GnRh remains an interesting further possibility. This experiment was therefore designed to investigate the effects of GnRh on the induction of oestrus and to present data on progesterone levels following treatment of anoestrous Angora and Boergoat does with a GnRh analogue.

On the 30th of January, 14 mature Angora goat does and 11 Boergoat does were allocated to the following 2 x 2 x 2 factorial treatments (see Table 1):

1. Breed: Angora versus Boergoat does.
2. Physiological stage: Lactating (90 days post partum) versus non Lactating.

3. Treatment: GnRh, 3µg; (Synthetic HOE 766; HOECHST) per intramuscular injection on day 0 and again day 9 versus no treatment.

Statistical analyses were performed by the  $x^2$  method (Snedecor & Cockrane; 1967).

Following injection of the does a ram of the appropriate breed was introduced to and remained with the does for the entire observational period of 30 days. The rams were fitted with harnesses and raddle blocks in order to identify oestrus daily at 08h00 and 18h00. Commencing on the day of GnRh injection (day 0) venous blood samples were collected at intervals of two or three days for 30 days. The serum was stored at  $-20^{\circ}\text{C}$  until analysed for progesterone concentration using the radiominoassay technique of Youssefnejadian, Florensa, Collins and Sommerville (1972), as modified by Faure (1975).

From the low basal serum progesterone concentrations (Figs. 1 and 2) it is obvious that all the does were in an anoestrous state at the commencement of the experiment. During the 30 days which the experiment lasted Boergoat does exhibited oestrus with no apparent effect of either treatments on the onset of oestrus (Table 1; Fig. 1). Six of these does (three GnRh treated and three control) were found to have increased serum progesterone levels following oestrus and proved later to have conceived. It is of interest to note that six of the Boergoat does (54,5 per cent) started cycling between days 7 and 28 following the introduction of the ram and it may be due to the stimulus of the ram as was previously described (Skinner & Hofmeyr, 1969).

In the case of anoestrous Angora goat does, the GnRh treatment did not induce oestrus (Table 1) or any significant increase in the serum progesterone concentration (Fig. 2). One of the control does showed oestrus on day 18 whereas two more had silent ovulations judged by the increases in their progesterone concentrations on days 18 and 25 respectively (Fig. 2).

In the  $x^2$  analyses of the data (Table 1) the only significant effect is produced by the breed factor ( $P < 0,01$ ). The physiological stage and GnRh treatment

had no significant effects and no interactions were found between any of the factors. In the light of these results it seems that an injection of 3µg of GnRh (HOE 778; HOECHST) is an unsuccessful means of inducing fertile oestrus and functional corpora lutea in anoestrous Angora goat does (as judged by the plasma progesterone concentrations). Although this dosage of 3µg proved to be adequate to produce ovulation in sheep (Findlay & Cumming, 1976) future work may include higher dosages and changes in the timing of the injections.

In the case of the Boergoat, the introduction and response to the presence of the male (Skinner & Hofmeyr, 1969) confounds the response to GnRh in this experiment. However, the absolute absence of any response in plasma progesterone concentration following the initial GnRh injection suggests that the response of this breed was mainly due to the presence of the ram

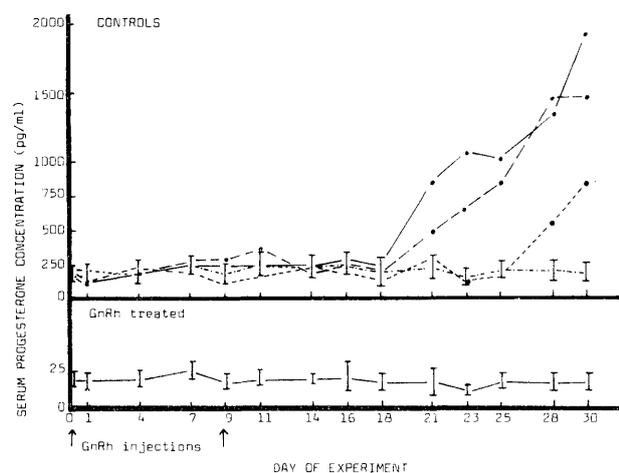


Fig. 1 Changes in the plasma progesterone concentrations of control anoestrous Boergoat does and does injected with gonadotrophin releasing hormones

rather than the GnRh treatment. In view of these findings further work should be designed to separate these factors, but much more attention should be given to the influence of the male on the induction of oestrous activity.

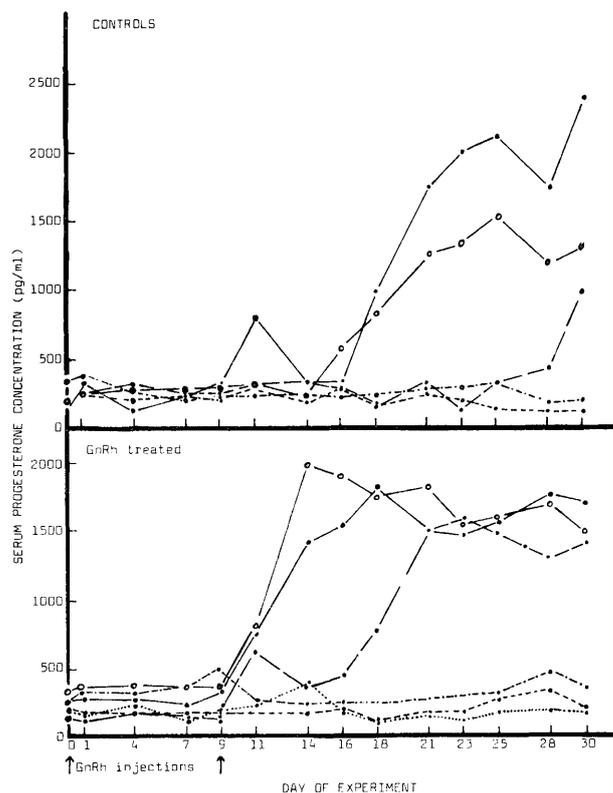


Fig. 2 Mean ( $\pm$  S.E.) plasma progesterone concentration of Control Anoestrous Angora does and does injected with a Gonadotrophin releasing hormone. Individual does showing significant increases in their plasma progesterone concentration are presented as separate lines

Table 1

The effect of GnRh injection and lactation on the oestrous response in Angora and Boergoat does over a 30-day period

	Angora Goats				Boergoats			
	Dry		Lactating		Dry		Lactating	
	3µg GnRh	—	3µg GnRh	—	3µg GnRh	—	3µg GnRh	—
Number	4	3	4	3	3	2	3	3
Number on heat by day 30	0	0	0	1	2	2	2	1
Mean days from injection to onset of oestrus	—	—	—	18	6	13	10	24
Number conceived	0	0	0	0	2	2	2	1

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