

PROGESTERONE LEVELS DURING PREGNANCY & EXOGENOUS PROGESTERONE TO PREVENT ABORTION

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Frozen Semen with today's technology, primarily based on the Camelot Farms method, combined with assiduous monitoring of progesterone levels, may achieve conception rates of 95% in a dedicated facility. We are lead to investigate the primary reasons for conception failure with frozen semen as we strive to achieve 100% for our breeder clients.

It is important to monitor the inexorable rise in progesterone to maximize your chances of a successful conception. This concept may differ from current academic thought where implants may be done at a specified time after the LH surge, reasoning that it is the LH surge that triggers ovulation and the progesterone level subsequent to this is of little or no consequence.

By adhering to the theory that the post ovulation progesterone curve IS critical to success demonstrable conception rates of 95% are achievable. Many bitches present with a false season in which progesterone may rise to the level that ovulation occurs but doesn't continue to rise and nourish fertile egg production only to slowly reduce after 10 – 12 days. These are bitches that will miss if implantation is done based on the point of ovulation premise.

At Rocky Ridge Frozen Semen Facility we implant up to 50 bitches each month with frozen semen and follow a protocol that is designed to proactively identify possible causes of a missed conception rather than being presented with a conception failure and asked to identify the cause retrospectively. Such an approach will rarely yield a definitive cause.

The literature abounds with many possible causes of a missed conception – some exotic and rare – many simple and often overlooked.

Proactive breeding management is good and affordable practice considering the value of our breeding greyhounds today. Service fees have risen proportionally in a market driven by the high prices paid for Group 1 Canine athletes (note not stud dogs). It is not unusual, depending on dam lines, to be presented with a litter worth \$6,000 per pup new born – any monitoring or investigative procedure in the gravid bitch costs usually less than 1% of the litter value.

It is our routine to recommend pregnancy confirmation by ultrasound four weeks after implantation. Once pregnancy is confirmed, at this time a progesterone test should be done to assess the extent of progesterone presence. Remember – progesterone may be high even if the bitch is not pregnant!

Progesterone is essential for implantation and maintaining pregnancy. It is secreted from the corpus luteum which is in effect an ephemeral endocrine gland arising from the rapid proliferation and differentiation of both granulosa and theca cells within the ovary. Serum progesterone levels rise with some variance after ovulation, peaking at 15 to 90ng/ml by 10 to 25 days after the LH peak and gradually reducing over the term of pregnancy.

The bitch ovulates many more eggs than are ultimately implanted. Blastocysts enter the uterus at about days 9 – 11 with trophoblast attachment occurring about day 18 and implantation approximately day 20 after the LH surge. There is a need to monitor bitches regularly to identify potential re-absorption individuals often indicated by past reproduction failures.

Clinically, with the use of ultrasound, we have observed many cases of viable and active foetal units at 3.5 weeks, even as late as 6 weeks gestation only to find no pups present at full term (63 days). There is no correlation difference between natural mating, AI, frozen implant or chilled semen and infectious causes of foetal loss are usually not evident in these cases. We were concerned that these cases of pregnancy failure may be due to hypoluteoidism – the premature failure of progesterone production by the corpus lutea with resultant decrease in serum progesterone and pregnancy failure.

Several syndromes seem to exist with hypoluteoidism. A familial tendency may exist. We have observed a bull terrier breed line and several greyhound breed lines, prone to such re-absorption, with the drop in progesterone occurring early in the pregnancy or rather never achieving a very high level. One breeding with a bull terrier bitch revealed a progesterone of 22.4ng/ml 14 days after mating. This dropped to 12.3ng/ml 25 days after mating and five viable fetuses were present. Therapy with hydroxyprogesterone hexonate (depo progesterone 100mg/ml) every two weeks at a dose of 8mg/kg IM was effective in maintaining pregnancy to full term in this individual. The last dose was given 10 days before whelping and progesterone levels were monitored every three days after this last injection.

Another scenario observed relates to the maintenance of a normal progesterone curve throughout pregnancy followed by a precipitous drop in progesterone earlier than expected. This occurs in affected individuals typically at about day 52 – 54, compromising foetal viability. This may account for many still born pups or litters and the need for progesterone monitoring to maximize the chances of a successful conception is becoming a viable option in those valuable litters that all care must be exercised to ensure a successful outcome.

As a guide the circumstances where progesterone investigation or supplementation is considered include

- Previous history of reproduction failure – no pups, high stillborn % or dead litter
- Simply good practice to identify a problem before it occurs
- In the first 8 weeks of pregnancy draw samples every 7 – 10 days
- Between days 7 to 56 post ovulation progesterone should ideally be above 15ng/ml
- Between days 57 to 60 post ovulation progesterone should be above 5ng/ml
- If outside these ranges samples may be drawn every 2 – 3 days to define a falling trend

It is good practice to recommend to clients that progesterone checks be carried out throughout pregnancy to identify potential problems and institute appropriate therapy. Reports of masculinisation of the foetus as a result of progesterone administration during pregnancy are present in the literature. This has not been observed by the author and isn't a significant consideration when a suspected hypoleutoid case is being assessed. The value of the litter saved to the clients breeding program by reasoned assessment and appropriate application of exogenous progesterone therapy is a valid therapeutic course rather than choosing not to administer progesterone and risk re-absorption by reason of concern of foetal masculinisation.

It is also important to consider progesterone levels at term. As a guide progesterone falls abruptly to less than 1ng/ml on the day preceding or the day of whelping. It is also important to measure the rectal temperature of the bitch in the last few days. It drops significantly following the final rapid drop in the blood progesterone concentration. Determine a base level a few days before and watch for this drop by checking temperatures 4 – 5 times daily. It may drop to 37°C or below. This temperature drop often occurs 8 – 24 hours before the first pup is delivered.

It is essential to maximise the delivery of live and viable pups and avoid the caesarian for an “overcooked” hypoxic one or two pup litter on day 66 because the bitch showed no signs of active parturition.