**"BETTER UNDERSTANDING OF PROGESTERONE LEVELS TO MAXIMIZE CONCEPTION "**

**Northwest Notes / THE LABRADOR QUARTERLY - Summer 2005**

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The "human" infertility practice I nursed with the last five years taught me so much about being a "woman" In spite of having two sons and being a fairly well-educated woman of fifty years, I was truly amazed at the real efforts of many woman to simply become successfully pregnant. Many of the women we saw were in their twenties and there was no issue at all regarding their "egg quality", but hormone irregularities interfered with either ovulation or loosing their uterine lining before the embryo they actually carried had a chance to implant properly. I was equally surprised to learn how very similar our dogs bodies functioned reproductively in comparison.

Puberty usually signals the time in life when a female is capable of successful reproduction. In our dogs, the first indication of "coming into heat" is usually the swelling of the vulva, or the outer opening to the vaginal canal. A few days later, there usually appears a bloody discharge. This stage of "the estrous cycle" can last anywhere between 4 and 10 days and is somewhat individual. During this stage, the female is unwilling to mate. Several hormone changes take place before this stage of the cycle and begin with the growth of the follicles on the ovaries.

This was absolutely fascinating at the IVF clinic (In vitro Fertilization), as we saw each woman, regardless of the complexity of "the type of cycle" she was on, daily or every-other-day for "transvaginal ultrasound" exams. The ultrasound probe was inserted into the vagina and we saw each ovary and the developing "eggs" in life-sized scans; photos of the exam could be printed and saved.

The human woman is born with approximately 700,000 "eggs" in the ovaries. In each monthly cycle, the pituitary gland at the base of the brain would send follicle stimulating hormone (FSH) to the ovaries and this would develop fluid-filled sacks, each containing the developing egg (which was at maturity, the size of the tip of a straight pin). The very basic "level" of fertility medicine, our goal was to use the U/S (ultrasound), to follow the follicles to a size where we knew the egg inside was mature. We then insured ovulation and more important, the timing of ovulation to then control insemination (naturally or by A.I.). This is what also happens for our female dogs. When the eggs are mature on the dog’s ovaries, lutenizing hormone (LH), is sent down from the brain to trigger ovulation.

As the follicles on the ovaries grow, they start secreting increasing amounts of estrogen into the blood stream and thus, initiates the bleeding we see. But before the bitch will come to "standing heat" or estrous, and be willing to mate, the hormone PROGESTERONE is needed. Here is where the bitch is very different from the human woman women don’t produce progesterone until after ovulation and from the old follicle that used to house the egg. Dogs begin producing progesterone from the mature follicles before ovulation takes place.

The secretion of small amounts of progesterone during this stage of the cycle causes the bitch to show signs of behavioral estrous. What we term standing heat includes: the bloody discharge becoming very light and often disappearing; Flagging or the deflection of the tail when approached by the male; and willingness to be mounted and bred by the male. This "stage" of the heat cycle usually last about 8-9 days and can differ somewhat based on the individual. The completion of actual ovulation can last as long as 3 to 8 days from the beginning of the process.

Dogs ovulate whether mating occurs or not. Throughout this stage the secretion of progesterone continuously increases and remains at a high level. Studies indicate that during the first estrous cycle the levels of most hormones in the blood stream are much lower than what is detected in subsequent estrous cycles of the same bitch. Individual animals are very consistent in the timing of their ovulation from one cycle to another. There are many tests available to the breeder for calculating the most optimum time for successful breeding.

By far, the most accurate is Blood Serus Progesterone Levels. The RIA or Radio Immuno Assay is helpful to the breeder, as you don’t have to test the bitch every day or even every other day, which can be expensive. This test of the progesterone level is very accurate and can pinpoint the time of the bitch’s ovulation in just a couple of tests. There is not a specific progesterone value for breeding a bitch successfully, such as the number 5, 8, 10, 15, mg/ml etc. This has been really interesting to me and I have charted the different levels at progesterone testing as well as the success of the mating for multiple bitches lately, and will try to present what I have learned in the fall LQ.

The majority of bitches ovulate between 3 5 mg/ml and a few a higher levels yet under 10 mg/ml. I found fascinating differences related to the age of the animal which interestingly enough, also relates to the human. The bitch should be bred between 60 and 72 hours after the progesterone testing estimates the day of ovulation to be. Here again, a fascinating difference between dogs and humans when a bitch ovulates her ovum (eggs), are immature and cannot be penetrated by the sperm until they are mature. In the dog this takes between 40 and 60 hours. "Fresh" semen live far longer in the uterus than semen that has been extended and chilled for shipment(approximately 24 hours), or from thawed semen that had been frozen. Fresh semen can therefore be placed in the uterus in advance of the still maturing ovum.

Fresh semen with good numbers and especially with good motility (forward progression, or ability to move), will live in the uterus for at least 4-5 days. The best time to introduce "fresh" semen by A.I. or from a natural breeding is 36 to 48 hours after the blood serum progesterone level shows ovulation. With the natural mating, skipping a day in between breedings allows the stud dog to rebuild his sperm count, and this has shown to relate to litter size. With fresh extended or "fresh chilled" semen that needs to be shipped overnight, the best way to do two breedings would be to inseminate the first time 24 36 hours after ovulation and then again the next day. We are so fortunate to have now "better science" helping us time the introduction of semen with knowing better when the bitch ovulates. Breeding failures today are more related to adhering to old fashioned and rigid breeding schedules rather than an actual problem associated with the bitch. A successful labrador breeding program must incorporate all of the new advances science provides us.