

Progesterone Testing - A Successful Breeder's Best Friend by Brian E. Greenfield, D.V.M.

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Do you wake up in a cold sweat fearing you have missed a breeding date? Are you feeling stressed as your bitch's due date approaches? Worried that you are going to waste the last vial of frozen semen from your champion stud?

A successful breeding program does not have to consist of one panic-laden situation to the next, but all too often this occurs. As a veterinarian working in a practice that sees over 900 dogs for artificial insemination and performs over 250 cesarean sections annually, I have learned to rely on and have confidence in the value of accurate and timely progesterone testing in the bitch. Although it seems that some people thrive under stressful conditions, replacing panic with informative scientific data invariably results in larger, healthier litters and happier owners. In today's era of co-ownership of valuable stud dogs and breeding bitches, it is not uncommon to have four or six differing opinions on the timing of a breeding. Indeed there are a lot of options. One breeding or two? Should it be a natural, vaginal, transcervical, or surgical breeding? The questions mount and the stress can build, but if you are armed with a basic working knowledge of the bitch's reproductive system and accurate progesterone tests, you can make good decisions. The progesterone test is your best friend.

First, let's review the basics. Prior to coming in season (estrus), serum progesterone levels in the bitch are low, less than 2ng (ng=nanograms). As the cycle continues, progesterone levels slowly climb to a level of 5ng, upon which ovulation occurs. The ovulation date can be as early as day 7 and as late as day 27 of the estrous cycle, emphasizing the importance of the blood test. Once a bitch hits 5ng and ovulates, subsequent serum progesterone levels can vary greatly. For example, at three days post ovulation we routinely see progesterones that may range from as low as 10ng to as high as 60ng, depending on the bitch. For ovulation purposes we are only interested in the day she exceeds 5ng. I commonly get the question, "Doc, we only ran one progesterone test on my bitch and it was 15ng, when did she ovulate?" The answer is impossible to know based on one test. I have seen bitches at 15ng one day after ovulation as well as 5, 10, 20, or 40 days after ovulation. You must have one test below 5ng and one above 5ng to determine ovulation day. For most bitches we start testing 6 days after the onset of vulvar swelling and bleeding, and we test every 1-3 days until ovulation, depending on the situation. After ovulation, serum progesterone levels will remain elevated, regardless of whether or not the bitch is pregnant, for approximately two months, at which point they return to near 0ng. It is important to note that vaginal bleeding, swelling, "flagging," and receptivity to males is predominantly a response to estrogens in the bitch's bloodstream, and not a reliable indicator of progesterone and consequently ovulation. She may or may not be receptive at the proper time. The use of physical indicators alone for breeding may not be a chance worth taking, especially with valuable semen.

So what does knowing the ovulation day do for us? It tells us when the eggs will be fertile, which is important with all breedings, but especially so with fresh chilled extended semen and with frozen semen. Once ovulated, a bitch's eggs take approximately 48 hours to become fertile. They will then remain fertile for approximately 48 hours. The idea is to maximize contact time between viable semen and fertile eggs. This requires a brief discussion on semen longevity. Fresh semen can remain fertile in the bitch's uterus for 3-5 days and in some cases even longer, depending on quality. Fresh chilled semen, because of energy lost in the cooling and subsequent warming process, may live only 24-48 hours in the uterus. Frozen semen, due to the stress of the freezing process and energy lost, may live only 12-24 hours in the uterus. Clearly, the shorter the sperm's life span, the more paramount it becomes to know when it should be inseminated to allow for maximum contact time with fertile eggs. In the case of fresh semen, there is more flexibility for two reasons.

First, there is usually not a limited quantity, and second, it lives a long time. We routinely recommend breeding days 1 and 3 or days 2 and 4 post ovulation with fresh semen, though one breeding is usually sufficient. With fresh chilled extended semen, because of a 24-48 hour life span, we recommend breeding 2 days after ovulation. As we discussed earlier, the bitch's eggs are just becoming fertile at this point, so we should have 1-2 days of good contact time. In the case of frozen semen, we recommend waiting three days after ovulation to do the breeding. This may make our clients nervous that we are waiting too long. However, it ensures that all the eggs are fertile when we put semen into the uterus that may live only 12 hours. We do not have the luxury of waiting around for eggs to become fertile. We have found the highest levels of success with frozen semen following surgical insemination and recommend it exclusively. Our levels of success using the above timing recommendations have been excellent; however, the manner in which a bitch is bred natural, vaginal insemination, transcervical insemination with an endoscope, or surgical insemination-must be carefully considered depending on factors such as reproductive history, age, physical characteristics, and semen quality.

Having an accurate ovulation date at the beginning of a pregnancy is also very important at the end of a pregnancy. A bitch's due date is 63 days from ovulation, regardless of breeding days. This is extremely valuable for planned c-sections, due to such factors as breed conformation, litter size, prior medical history, or complications arising during the pregnancy. It is also very helpful when whelping. Knowing an exact due date not only helps breeders prepare for the arrival of a litter, but, often more importantly, it can alert us to a premature or overdue labor, allowing for prompt medical intervention if indicated.

Progesterone monitoring can also be important during gestation. Some bitches have a problem maintaining adequate levels of progesterone during a pregnancy, usually resulting in resorbed or aborted fetuses. Monitoring progesterone levels is critical in bitches with such histories, as supplementation of progesterone at the proper times could mean the difference between live or dead puppies.

Often we are confronted with owners who have difficulty "catching" a bitch's heat cycle. This is usually due to minimal outward physical signs such as vulvar swelling and bleeding. We recall that progesterone levels stay elevated for approximately two months after ovulation in all bitches, whether pregnant or not. Obtaining an elevated progesterone level in such an animal at the very least indicates she was in season in the last two months, often helping a breeder know approximately when to expect the next cycle. Conversely, a low progesterone level, less than 2.5ng, means there have been no eggs ovulated in the past two months. This may alert a breeder to an upcoming cycle, or, if the level remains chronically low, the veterinarian may be alerted to begin a thorough medical workup.

The usefulness of accurate and timely progesterone testing should not be underestimated. It is a valuable tool and in some cases of critical importance in helping a veterinarian and breeder choose the proper course of action. Proper use and interpretation of these tests will result in not only more pregnancies, but larger, healthier litters, fewer complications with your bitch, insight into potential problems, and, as I have experienced, fewer panicked telephone calls at three o'clock in the morning.

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