

Optimizing Canine Reproduction: Breeding Management and Artificial Insemination

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Optimal Breeding

Dog and Bitch should be young and healthy

Check for any infections, diseases or defects

Start early! Keep track of the bitch's cycle from inception to determine optimal insemination period

Use a combination of vaginal smear, vaginoscopy and progesterone assays to pinpoint the exact timing

Treat each bitch as an individual - there is no such thing as a "textbook" case

Ensure semen concentration and quality meet or exceed minimum requirements

Use proper technique, tools and hygiene for insemination

Coordinate and plan ahead with the breeders and veterinary staff

There are a number of options when considering artificial insemination. The semen can be fresh, frozen or chilled shipped and the insemination can be done vaginally, laproscopically, surgically or transcervically. However in all cases **breeding management is essential!**

Ideally both dog and bitch should be young and healthy, ranging in age from 2-7 years. The dog should be checked for Brucella and Herpes and the bitch for all infectious, hormonal and anatomical defects **before mating**. A negative test result for Brucella within 30 days or since the last natural breeding is necessary. A bitch carrying the herpes virus can experience pregnancy losses related to the disease so careful monitoring is required.

The minimum insemination dose should contain 100-150 million normal sperm with ideally motility of over 70%. If using chilled semen a trial collection and a "chill check" is advisable a week before the anticipated shipped date. Specially formulated extender and shipping containers designed for canine semen should be used. Everything should be organized with the recipient's local veterinarian or breeding facility.

Breeding management of the bitch needs to start early, particularly in females who have not had their cycles followed earlier. Due to the very unique reproductive cycle of the dog, the determination of the optimal timing for artificial insemination or mating is vitally important. Even if the bitch accepts mating for several days, the eggs will be fertilizable for only a very short period of time - probably not longer than one or two days. Inadequate timing, particularly when using chilled or frozen semen, can have dramatic consequences. Vaginal smear and vaginoscopy are useful indicators; however the optimal reproduction management should also include the follow-up of progesterone dynamics. A single assay will never be enough to determine the optimum time for AI or mating.

The progesterone course during the fertility cycle in an average bitch is displayed in table 1. However, the average bitch only exists in textbooks and a trained veterinarian is required to analyze and interpret the data in individual bitches. Dramatic changes and differences can be observed between individual animals not following the "average population".

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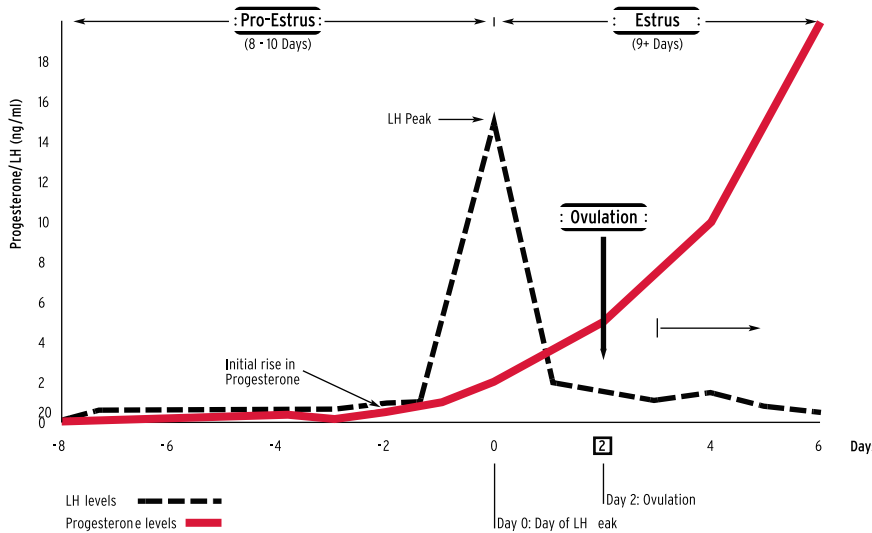
Table 1

Progesterone Level

Progesterone Course

<1 ng/ml <3.18 nmol/L	<ul style="list-style-type: none"> • Basal progesterone serum concentration • Either anoestrus or early pro-estrus. If proestrus, vaginal smear and vaginoscopy should be done • Restart testing progesterone only when obvious signs of end pro-estrus or early oestrus are observed at vaginal smear and vaginoscopy
1-3 ng/ml 3.18 - 9.54 nmol/L	<ul style="list-style-type: none"> • Pre-ovulatory progesterone increase • LH-Peak is generally observed when the progesterone value is around 2 ng/ml or when the progesterone value is observed to significantly increase from previous values
4-7 ng/ml 12.72 - 22.26 nmol/L	<ul style="list-style-type: none"> • Values around the time of ovulation
5-10 ng/ml 15.9 - 31.8 nmol/L	<ul style="list-style-type: none"> • Period of final maturation of the oocytes, expulsion of the polar bodies and beginning of receptivity of oocytes
>10 ng/ml >31.8 nmol/L	<ul style="list-style-type: none"> • Beginning of the fertile period • First mating/insemination time is determined depending on the type of semen used (fresh, chilled or frozen) and depending on the type and number of AI's • Second service will be performed either 24 or 48 hours after the first one, depending on the semen used (fresh, chilled or frozen)
>20 ng/ml >63.6 nmol/L	<ul style="list-style-type: none"> • In many bitches the cervix will close and a vaginal insemination will not be successful. If necessary a transcervical artificial insemination can be performed (ideally endoscopically)

During pregnancy the minimal progesterone value necessary to allow maintenance of the pregnancy is 2 ng/ml (6.36 nmol/L). Twelve to 48 hours before the initiation of parturition, the progesterone value drops below 2 ng/ml (6.36 nmol/L). In this case, and when no signs of delivery are observed, a careful evaluation of the bitch is required as it is possible a caesarean section might be necessary.



The combination of vaginal cytology, vaginoscopy and determination of the progesterone level in a dynamic approach is the basis for an optimal and successful canine reproduction management. Bad results are generally the consequence of:

- Poor breeding management
- Issues with the semen - reduced volume, concentration and/or quality
- Issues with semen shipping
- Use of poorly adapted technique for insemination

By controlling these factors the results obtained can be easily superior to those of natural breeding with all the benefits of artificial insemination in term of management, hygiene or cost.