Your Partner in Reproductive Science

The ROYAL CANIN® philosophy, *Knowledge is to be Shared*, has been made possible in part through our partnership with you – the dog breeder. In an effort to return the favor, we'd like to share science-based reproduction and best kennel practices education.

Maximizing the Probability of Successful Copulation

Excerpt from Royal Canin Successful Guide to Dog Breeding

IDENTIFYING THE IDEAL TIME FOR THE FEMALE

THE FEMALE'S ESTROUS CYCLE

The estrous (reproductive) cycle in females is mono-estrous (one period of ovulation per cycle) with spontaneous ovulation (ovulation is not triggered by exterior stimulus). It is however possible to observe heat in young females terminating before ovulation, mimicking an ovulation cycle. In that case, fertile heat often returns a few weeks later. This disjointed heat is not regarded as pathological in females unless it occurs in the first two months of life, in which case it is known as false heat.

PRO-ESTRUS

This is the first phase of the reproductive cycle. It lasts for about 10 days, but there are large variations going from 5 to more than 20 days. Estrous is generally announced by swelling of the vulva, heavy congestion of the vagina and vulva lips and, in particular, a bloody discharge through the vulva from the uterus. During pro-estrus the smell of the urine and the secretions (of pheromones) from the uterus and vagina attract males, but the female generally refuses to copulate.

ESTRUS

This is the second phase, during which the female's behavior changes and she starts to become receptive to males. Its duration is also highly variable, 7 days on average, but ranging from 3 to 30 days. Ovulation occurs during this phase.

DIESTRUS (METESTRUS)

For about two months after estrous, regardless of whether they have been mated, hormonal functioning is virtually identical in all females. They refuse the male and secrete large quantities of progesterone. The terms diestrus, metestrus and luteal phase are all used indiscriminately. The term luteal phase refers to the ovarian corpora lutea, the yellow bodies that produce progesterone.

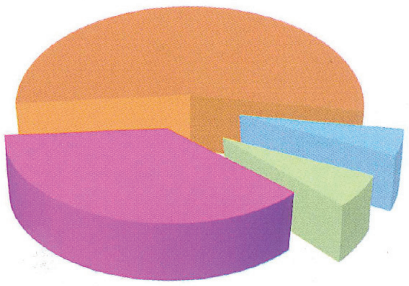
ANESTRUS

After having been in heat, females will remain sexually dormant for at least two to three months, sometimes much longer.

PARTICULAR CHARACTERISTICS OF FEMALES DURING HEAT

Unlike most species, the female's ovaries start to secrete progesterone a few days before ovulation. The progesterone level in the blood gradually increases, regardless of whether the female is pregnant or not. Progesterone is therefore an indicator of ovulation but not of gestation.

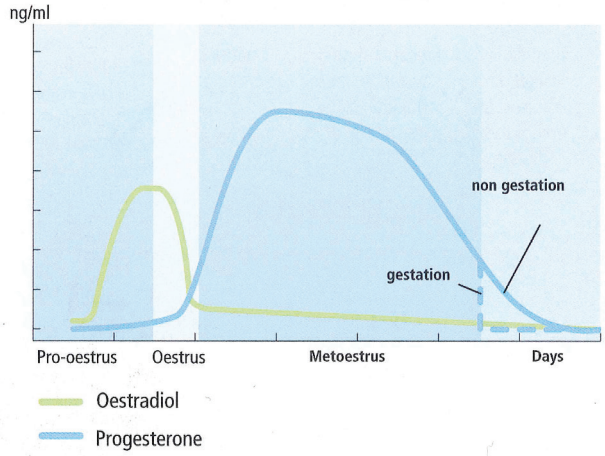
The various phases in the female reproductive cycle



Heat

- Pro-oestrus: average = 10 days
- Oestrus: average = 7 days
- Dioestrus: 2 months
- Anoestrus: average = 3 months

Primary secretions in females during the reproductive cycle



DETERMINING THE OVULATION PERIOD

Breeders sometimes wonder whether it is worthwhile monitoring estrous in females to pinpoint the optimal moment for mating. This can actually help the breeder's day-to-day work considerably and improve reproductive success incorrect determination of when to mate is the primary cause of infertility in females.

BEHAVIOR AND MORPHOLOGICAL CHANGES

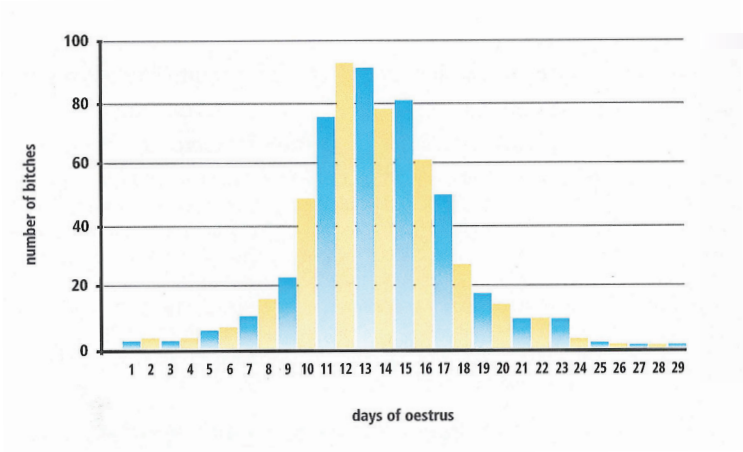
Systematic copulation twelve days after the first blood discharges then two days later is a practical strategy for the breeder. However, while 40% of females are ready for copulation between day 10 and 13 of heat, 10% are ready before this and 50% after. By always mating the females on day 12 of heat without determining more precisely the day of ovulation you risk them not becoming pregnant or having poor litter size.

Lighter losses from the vulva after discharge of blood, is generally a sign of the end of pro-estrus but it is not a reliable sign of ovulation. While the appearance of discharge can help breeders, it is not a precise science. Acceptance of the stud or the heat detector male and the lateral deviation in the carriage of the tail are not very good criteria either. Estrus lasts 7 days on average, but it can last anything between 1 and 15 days, so just because there are no problems during copulation, it does not mean that it is the optimal time for the female. Furthermore, many females allow copulation when they are suffering from urinary infections or ovary pathologies (ovarian cysts). Acceptance of copulation is not enough on its own, due to its unreliability.

The resistance of the vaginal mucosa can also be measured. During pro-estrus, resistance gradually increases before falling in the 48 hours around ovulation. Breeders should be more interested in the curve than the values. The maximum values and the date of decrease vary from one cycle to another - monitoring on a daily basis - even twice a day if it is to be reliable. A progesterone test should also be conducted, although there is a risk of infection when using the ohmmeter tube so hygiene is critical.

When all breeds are taken together, heat occurs every 6 months on average. This interval can vary due to various factors (breed, environment, social contact, medical treatment). The regularity of heat is the important thing. A veterinarian should be consulted immediately if a female's heats occur closer together or less and less frequently.

SOURCE:
Practical Guide To Dog Breeding Pages 220-225 Dominique Grandjean, Sarah Riviere, Phillipe Pierson et al.
Fourth Edition 5/25/2010 © Royal Canin SAS



Distribution of dates of ovulation (379 females, studied at Veterinary school in Alfort's reproduction centre).

It can be seen that while 40% of bitches are effectively ready for mating between days 10 and 13 of estrus, 10% were ready before these dates and 50% after.

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