Reproduction in the Canine and Feline

Animal Sciences 434
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The Bitch

- Puberty - 6 mo.
- Monoestrus
  » One estrus during breeding season
- Estrous Cycle
  » Proestrus
  » Estrus
  » Metestrus or Diestrus
  » Anestrus

Estrous Cycle (Non-Pregnant)

- Proestrus (9 days)
  » Vulva swollen
  » Bloody discharge
  » Attracted to male but does not mate
- Estrus (9 days, ovulation day 2)
  » Accepts male
  » Straw-colored discharge
- Metestrus or Diestrus (90 days)
  » False pregnancy
- Anestrus (5 months)
  » Sexual inactivity

Hormonal Changes

- LH
- Progesterone
- Estrus
- Proestrus

Estrous Cycle - Pregnant

- Proestrus (9 days)
  » Vulva swollen
  » Bloody discharge
  » Attracted to male but does not mate
- Estrus (9 days, ovulation day 2)
  » Accepts male
  » Straw-colored discharge
- Pregnant Metestrus/Diestrus (50 - 60 days)
  » Pregnancy
  » Parturition (63 days from ovulation)
- Anestrus (5 months)
  » Sexual inactivity
Mating

- Occurs during estrus
- Length of courtship by male is variable
  - Licks vulva
  - Bitch stands with tail to one side
- Mounting
  - Male mounts without erection and penetrates
    - Os penis
  - In vagina, male bulbus glandis engorges, thrusting
  - Male dismounts and turns around but penis remains in vagina “the tie”
  - Ejaculation
  - Tie last 5 min to 1 hour

Canine Mating

- First Stage Coitus
  - 1-2 min

- The Turn
  - 2-5 sec

Canine Mating cont.

- Second Stage Coitus
  - 5-45 min

Mating (cont.)

- Mate 2 times
  - Days 11 and 13 after start of proestrus
    - Sperm lasts up to 7 days in female
- Infertility
  - Often from mating not at appropriate time
- Hormonal detection of ovulation
  - LH increase associated with progesterone >0.5 ng/ml
  - Ovulation progesterone 2-5 ng/ml

Pregnancy

- 63 days (58-68)
  - Range due to dating from breeding not fertilization
- Hormonal Changes
  - Similar to not mated
  - Progesterone maintained higher
  - CL required to maintain pregnancy
  - No placental progesterone
  - Placental relaxin
  - Drop in progesterone triggers parturition
- Detection
  - Abdominal palpation at 3 - 4 weeks
  - Ultrasound after day 16
- Parturition
  - Hormones similar to other farm animals

Parturition

- Delayed Parturition
  - Primary inertia
    - Does not show signs of parturition
    - Does not progress from stage 1 - stage 2
    - If green fluid, Caesarian
    - Give oxytocin in several small doses
  - Secondary inertia
    - Uterine exhaustion
    - Oxytocin
Estrus Control
- Induction
  » eCG
- Prevention
  » progestins

Disorders of the Bitch
- Cystic endometrial hyperpalsia (pyometra)
  » Uterus fills with fluid
    - Progesterone increases first
    - Contamination of uterus by vaginal bacteria
    - Toxemia results from absorption of fluid and endotoxins
  » Thirst, vomiting, inappetence, shock, death
  » 4-6 weeks after estrus
  » Bitches >9 years that have not had a previous pregnancy
  » Can be open or closed
  » Hysterectomy

Disorders of the Bitch
- False pregnancy
  » Normal to some extent
  » 60 days after estrus
  » May lactate, gain weight, nesting behavior
- Mammary tumors
  » Thought may be related to similarity to pregnancy and non-pregnancy

Dog Anatomy
- Bulbus Glandis

Disorders of the Male Dog
- Hypersexuality
  » Castrate
  » Progesterone
- Cryptorchidism
  » Normal descent at days 7-10 after birth
  » Should be removed if retained for >1 yr.

Artificial Insemination
- Bitch does not accept the male
- Shipment of semen
- Minimize the number of breedings
Insemination of the Bitch
- Bitches ovulate around day 10 after they enter proestrus (discharge) or about 1 - 2 days of estrus.
  - Ovulation can be detected by:
    - LH assay (peak LH value + one day)
    - Progesterone assay (>5 ng/ml)
    - Cytology of vaginal smear (>50% cornified cells)
- Remember oocytes in the canine are ovulated as 1° oocytes and must mature in the oviduct to a 2° oocyte before fertilization.
- Fresh or cooled semen, inseminate 2 days after ovulation detected and again 48 - 72 hr later.
- Frozen semen, inseminate on day 5 - 7 after ovulation.
- Uterine insemination better than cervical.

Artificial insemination in the Bitch

Feline Reproduction
- Domestication?
- Female - Queen
- Male - Tom
- Puberty
  - 6 - 9 months
- Estrous Cycle
  - Proestrus
    - 1 - 2 days
    - Attracted to males
    - Rubs head and neck on objects
    - Vocalization, posturing and rolling
  - Estrus
    - Accepts male
    - 4 - 6 days if male present, 10 days if no male
    - Ovulation 27 hours after mating (induced)
    - Affectionate to aggressive towards owners
  - Proestrus if queen did not ovulate
    - 8 - 10 days
  - Diestrus after ovulation
    - Pseudopregnancy - 40 days
    - Pregnancy - 60 days
  - Anestrus 3 - 4 months

Estrous Cycle
- Pro-estrus
  - 1 - 2 days
  - Attracted to males
  - Rubs head and neck on objects
  - Vocalization, posturing and rolling
- Estrus
  - Accepts male
  - 4 - 6 days if male present, 10 days if no male
  - Ovulation 27 hours after mating (induced)
  - Affectionate to aggressive towards owners

Estrous Cycles Options
- Proestrus, 0 - 2 d
- Estrus, 2-19 d
- Diestrus, 8-10 d
- Pseudopregnant, ~40 d
- Anestrus, 30-90 d
Hormonal Changes in the Queen

- **Proestrus**
  - Estrogen increases due to follicular development
- **Estrus**
  - Estrogen high until ovulation
  - Ovulation 27 hr after mating (vaginal stimulation)
- **Diestrus**
  - No CL if mating does not occur, so no diestrus
  - CL produces progesterone (63 days, peak day 20)
  - If pregnancy does not occur or fails, CL life only 1/2 that seen in pregnancy.

Mating

- Queens call or vocalize (low moaning sound)
  - Owners may think a sign of illness
- During mating
  - Tom bites neck female
  - With erection penis faces forward

Erection and Mating
**Mating**

- Queens call or vocalize (low moaning sound)
  - Owners may think a sign of illness
- During mating
  - Tom bites neck female
  - With erection penis faces forward
  - Only lasts 30 seconds to 5 minutes
  - As male dismounts female gives a loud copulatory call and Tom retreats
  - Mating occurs 6 - 7 times until queen declines
  - May occur for up to 4 days

**Cat Mating**

**Pregnancy**

- 63 days
- Diagnosis
  - Abdominal palpation day 17 - 25

**Parturition**

- Similar to other species in events and hormonal control
- Dystocia rare - caesarian
- Uterine inertia - oxytocin

**Control of Estrus**

- Ovariohysterectomy
- Induction of Ovulation
  - HCG
  - Vaginal Stimulation
- Prevention of estrus
  - Progestins

**Disorders of the Queen**

- Pseudo-pregnancy
  - Mating to sterile male
  - Vaginal stimulation or hormonal stimulation
- Cystic endometrial hyperplasia (Pyometra)
  - Same as in bitch
- Failure to cycle
  - Stress, poor nutrition, disease, inadequate light, cystic follicles
### Diseases of the Tom Cat

- Spraying
  - Castration
- Cryptochid
  - Descended at birth
  - Treatment is castration

### Estrus Behavior in A Bitch

http://www.ansci.wisc.edu/jljp1/as434/powerpoint/fa07/doi_estrus4.mov