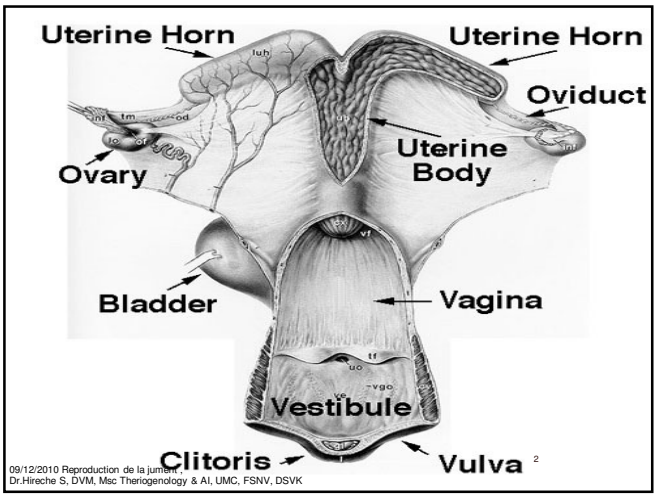
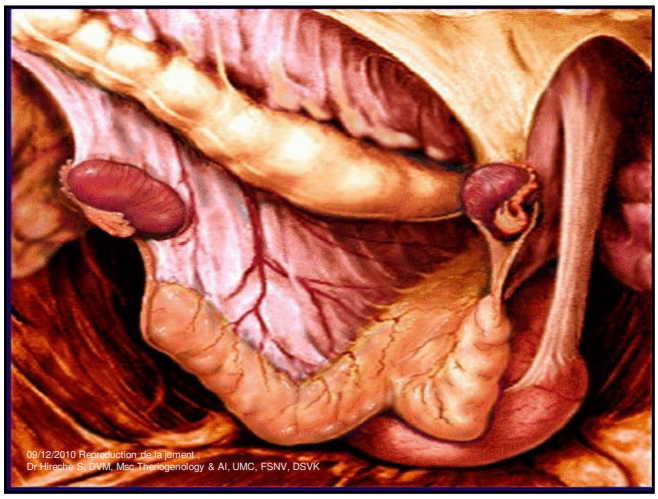
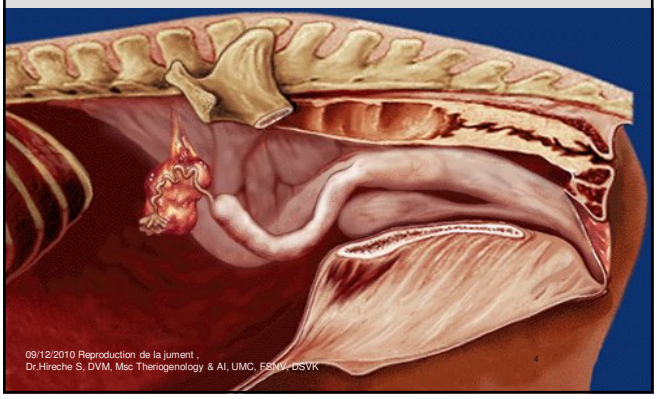
REPRODUCTION DE LA JUMENT

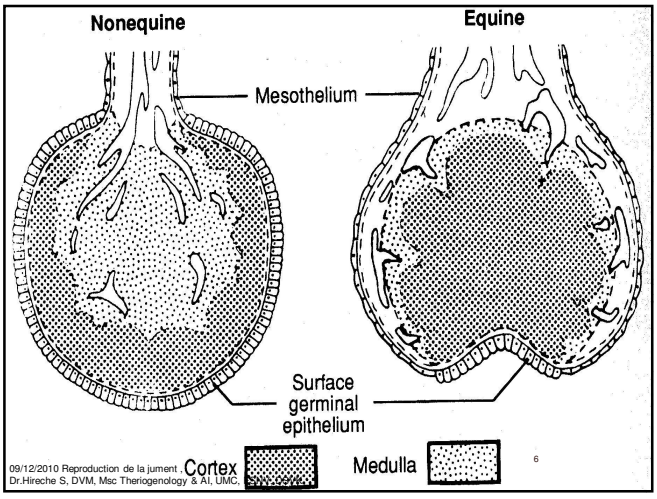
Dr. Sana Hireche
DVM, MSc Theriogenology

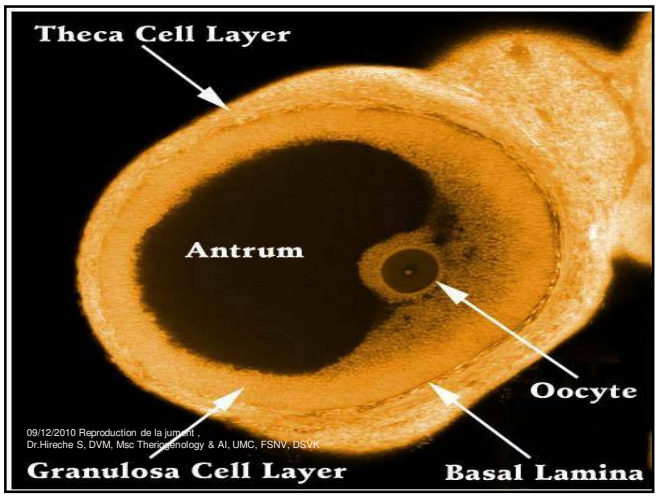




Appareil reproducteur de la jument







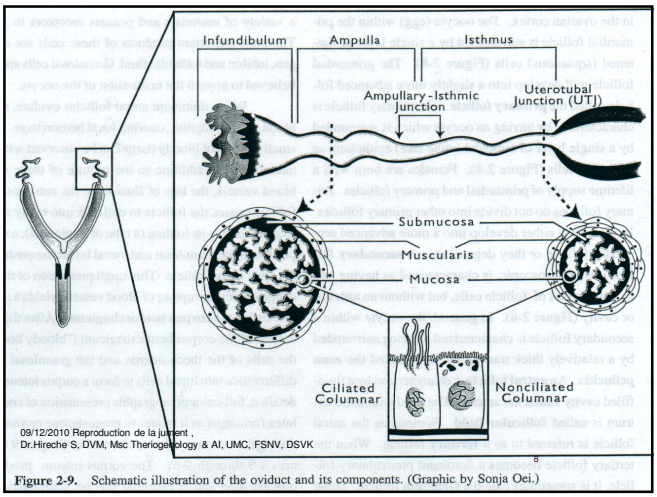


Figure 2-9. Schematic illustration of the oviduct and its components. (Graphic by Sonja Oei.)

Trompes utérines - fonctions

- Transport de l'ovocyte vers le site de fertilisation
- Jonction utéro-tubaire permet aux spermatozoïdes d'entrer dans l'isthme
- Isthme
  - Capacitation
  - Stockage des spz

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Trompes utérines - fonctions

- Seuls les ovocytes fécondés entre l'utérus ~ 5 jours après l'ovulation
- Les ovules non fécondés sont conservées dans la trompe utérine

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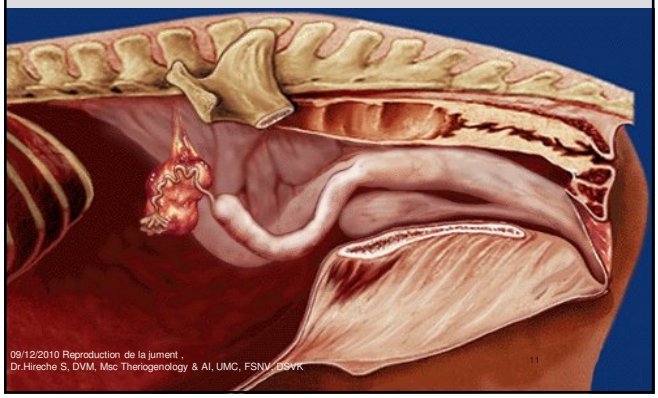
Appareil reproducteur de la jument



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UTERUS

- Septum médian
  - Ou les cornes utérines rejoignent le corps de l'utérus
- Papilles des jonctions utéro-tubaires
- Surface de l'endomètre
  - Plis longitudinaux

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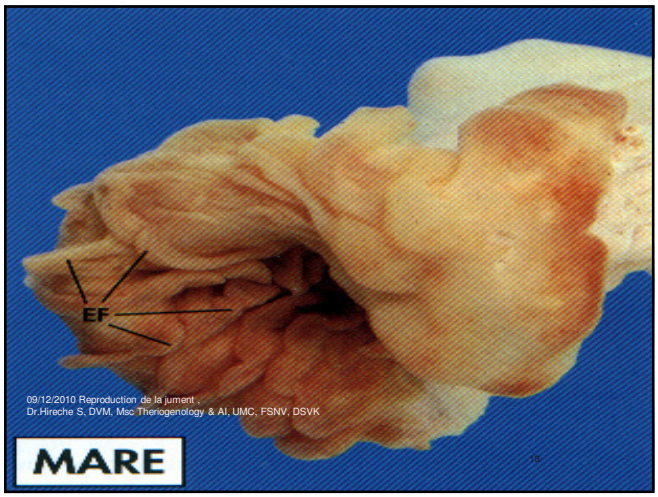

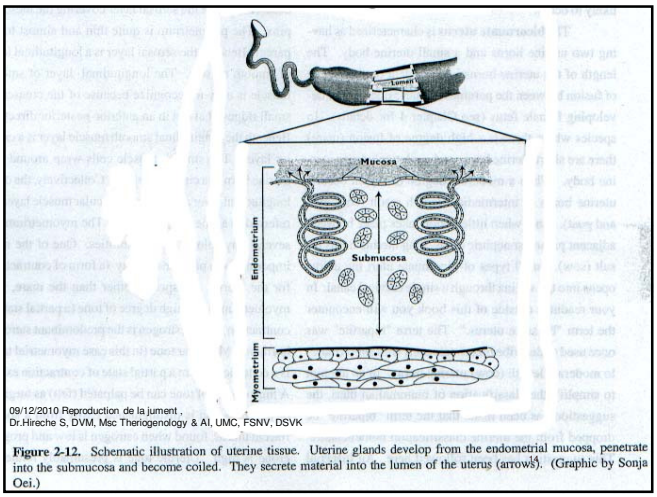

Figure 2-12. Schematic illustration of uterine tissue. Uterine glands develop from the endometrial mucosa, penetrate into the submucosa and become coiled. They secrete material into the lumen of the uterus (arrows). (Graphic by Sonja Oei.)

Vascularisation ovarienne et utérine

- Ovaires
  - A/V ovarienne
- Utérus
  - Branche utérine des A/V vaginales
  - Artère/veine utérine
  - Branche utérine de l' A/V ovarienne
- Endometrium PGF2α:
  - Voie systémique

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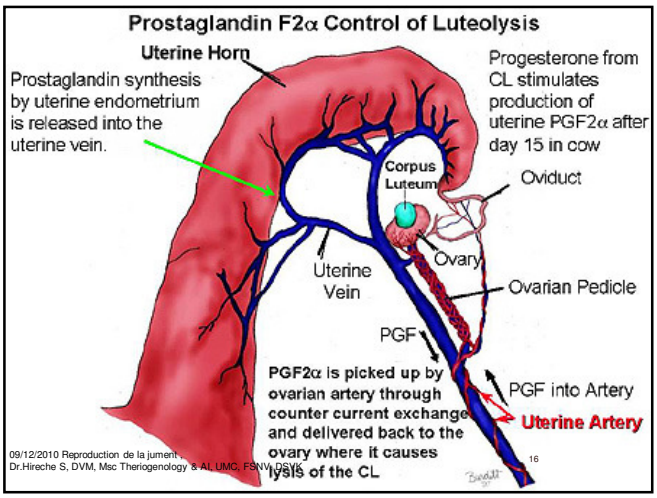
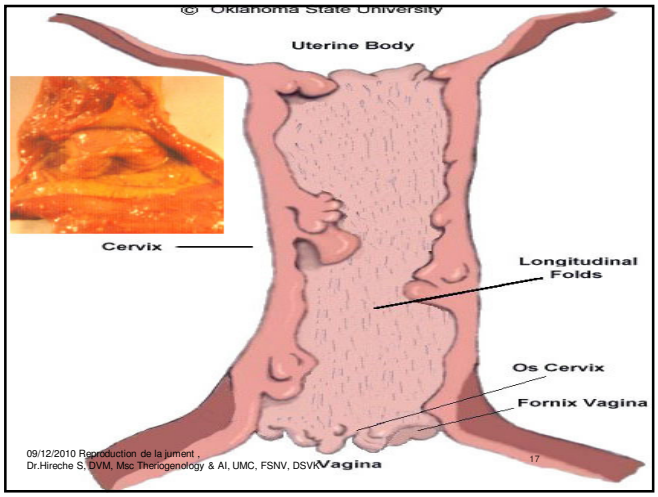
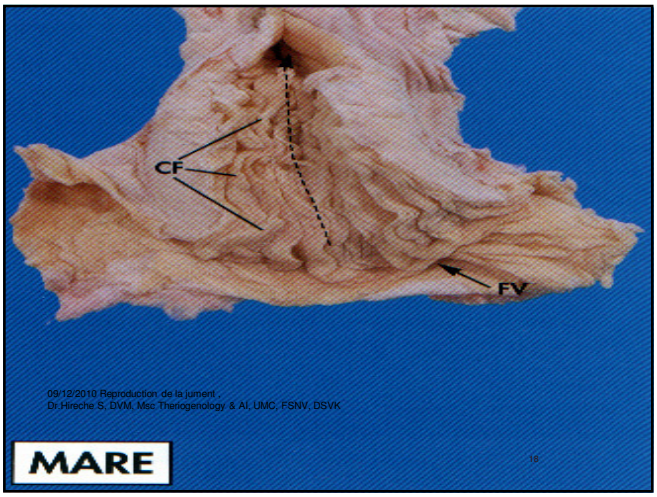






VAGIN

- Connexion entre l'utérus et le milieu extérieur
- Localisation: cavité pelvienne
- Longueur: 15 – 20 cm
- Vaisseaux dans les parois latérales
- Sphincter vestibulo-vaginal
  - Barrière contre les contaminations

VESTIBULE

- Caudalement aux plis transverses du vagin
- 10 – 12 cm de longueur
- Glandes vestibulaires

VULVE

- Caudalement au vestibule
- Deux lèvres et clitoris
- Commissures dorsale et ventrale

VULVE

- 70% de la vulve normalement en dessous du plancher pelvien
- Clitoris
  - Homologue au pénis de l'étalon
  - Contient du tissu érectile bien développé

Tractus génital: jument

- Constrictions de la portion tubulaire
  - Jonction utéro-tubaire
  - Col de l'utérus
  - Sphincter vestibulo-vaginal
  - Lèvres vulvaires

Perinée

- Conformation
  - Parfaite coaptation des lèvres vulvaires
  - Pas plus de 4 cm de fente vulvaire entre la commissure dorsale et le plancher pelvien
  - Angle vulvaire
    - La pente cranio-caudale de la vulve pas > 10° de la verticale

LE CYCLE OESTRAL

- Cycle œstral
  - Période d'une ovulation à l'ovulation qui succède, chaque ovulation s'accompagnant de signes d'oestrus et d'une concentration de P4< 1 ng/ml
- Espèce saisonnière polyoestrus

LE CYCLE OESTRAL

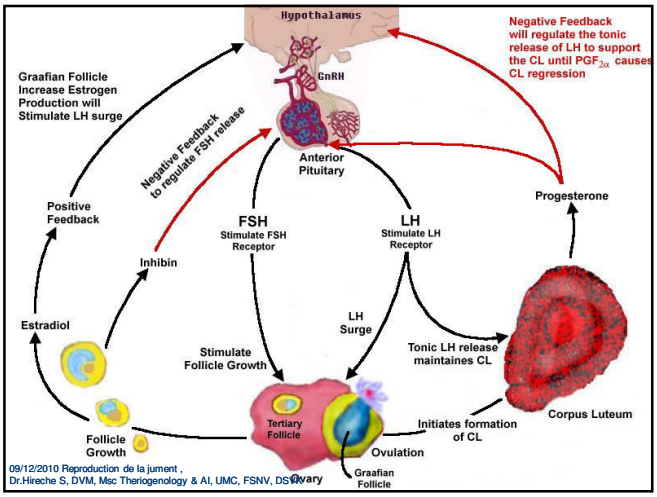
- 21-22 jours (18-24 jours)

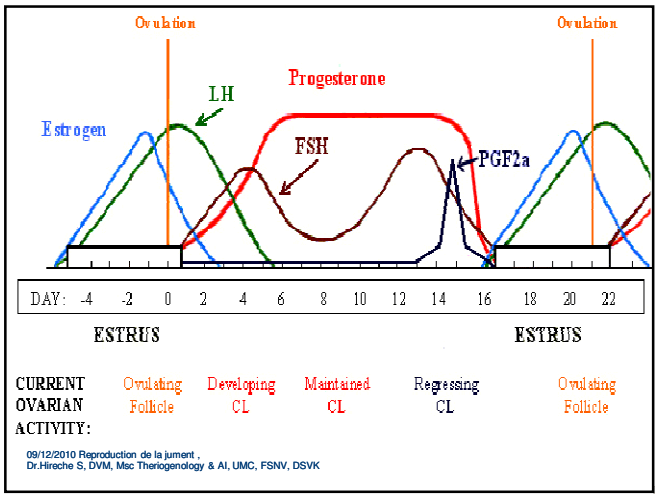
LE CYCLE OESTRAL

- Phase folliculaire
  - Œstrus
  - 4-7 jours
  - La jument accepte l'étalon
  - Le tractus génital se prépare à accepter et transporter les spermatozoïdes vers les oviductes pour « fertilisation »
  - Ovulation: dans les 48 heures de la fin de l'oestrus

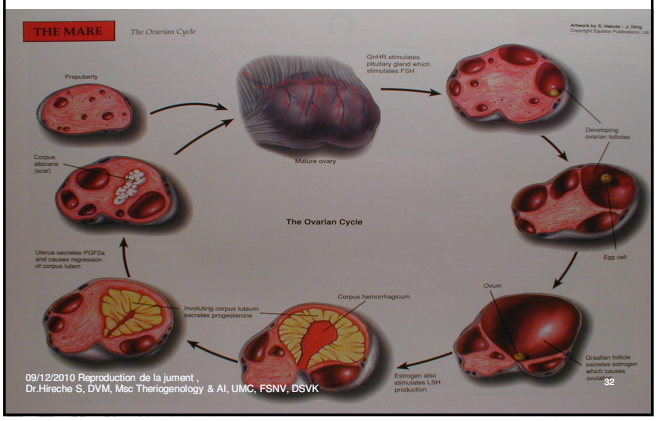
LE CYCLE OESTRAL

- Phase lutéale
  - Di-oestrus
  - La jument n'accepte pas l'étalon
  - Tractus génital se prépare à accepter et nourrir le conceptus
  - Se termine par la régression du corps jaune et l'initialisation d'une nouvelle croissance folliculaire
  - 14-15 jours



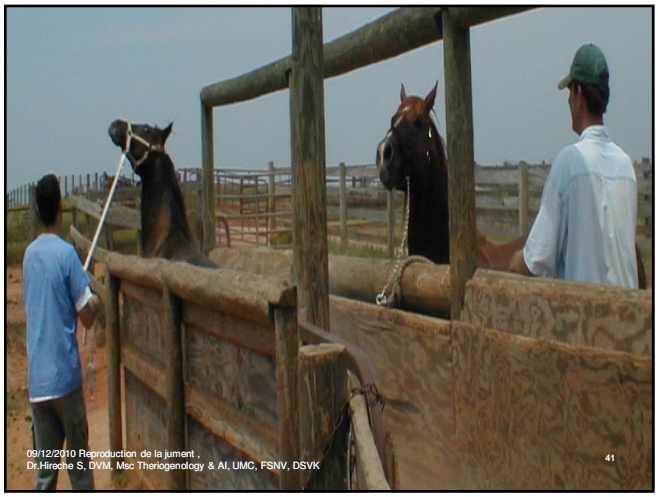


Cycle ovarien



Phase folliculaire

- Au début de l'oestrus
  - L'oestradiol est le stéroïde le plus dominant
  - Faible taux de P4(< 1 ng/ ml)
  - Les juments montrent des signes d'oestrus quand elles sont teasées
    - Eversion du clitoris
    - Urination fréquente
    - Reste immobile à l'approche de l'étalon



Mare showing typical signs of oestrus: squating tail raised, urinating and everting clitoris

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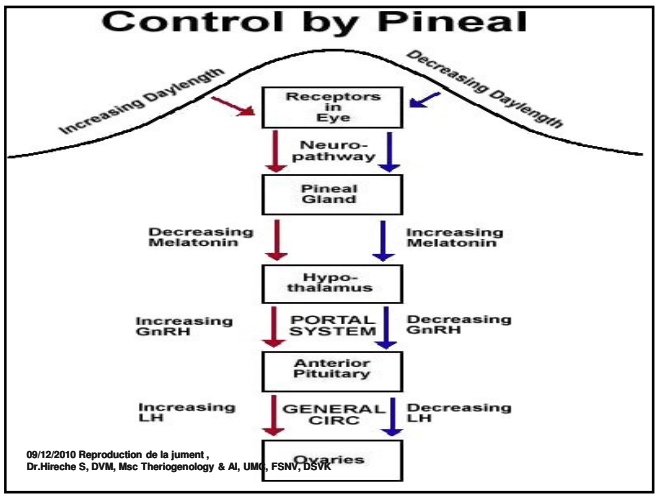
Mare showing typical signs of nonestrus : ears laid back , « switching » tail, and attempting to avoid stallion

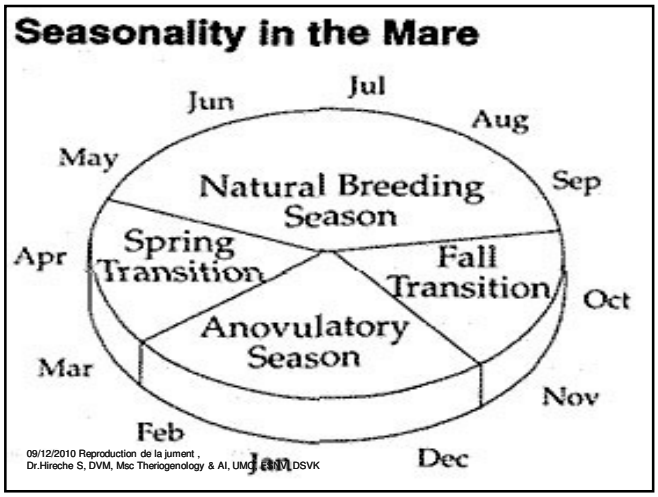
Table: Criteria used to stage the estrus cycle of the mare

Criteria	Estrus	Diestrus
Teasing with stallion	1. Tail raise 2. Squat, tip pelvis 3. Urinate 4. Evert clitoris	1. Switch tail 2. Kick, squeal 3. Attempt to bite stallion 4. Move away from stallion
Examination of ovaries	1. Large follicle(s) that may be soft 2. Follicle may be triangular with scalloped edges on ultrasound examination if mare is nearing ovulation 3. No corpus luteum on ultrasound examination	1. Presence of corpus luteum on ultrasound examination 2. Follicles of varying sizes, may be large
Examination of uterus	1. Relaxed with soft texture 2. Edematous endometrial folds visible on ultrasound examination	1. Firm texture ("good tone") 2. Uniform echogenicity on ultrasound examination
Examination of cervix	1. Shortening, widening 2. Relaxed with soft texture 3. Pink and drooping on vaginal floor when visualized through speculum 4. Lumen open 1-3+ fingers on digital examination per vagina	1. Long and narrow with firm texture 2. Pale, dry, and centrally located in cranial vagina when visualized through speculum 3. Closed lumen on digital examination per vagina



Saisonalité chez la jument

- Phases du cycle sexuel annuel
  - Saison de reproduction
  - Transition automne
  - Anoestrus
  - Transition vernal



Saison de reproduction (breeding)

- Receptivité avec ovulation
- Saisonnier, polyoestrus
- Fin printemps et été

Autumnal Transition

- Anovulatory receptivity
- Transition from reproductive competence to incompetence
- Coincides with autumn equinox (Sept 21)
- Erratic estrus behavior without ovulation
- If ovulation occurs, CL function not maintained

Anestrus

- Time of complete reproductive incompetence
- Centers around and after Dec 21 (winter solstice)

Anestrus

- Characterized by
  - Reduction in GnRH content and secretion
  - Reduction in LH and FSH
  - Inactive ovaries
  - Loss of ovarian steroids
  - Mares' sexual behavior toward stallions becomes more passive

Vernal Transition

- Another period of anovulatory receptivity
- Vernal equinox (March 21)
- Springtime transition from anestrus into breeding season
- A series of steps leading to resumption of reproductive activity

Events Of Vernal Transition

- Photoperiod response
- Increased GnRH secretion
- Increased FSH secretion
- Initiation of follicular development
- Little LH secretion (high FSH: LH ratio)

Phase folliculaire

- Follicule dominant
  - Ovulation: diamètre >3.5 cm (4-4.5 cm)
  - Incidence de double ovulations: 16%
- Atresie

Phase folliculaire

- Fréquence des pulses de GnRH augmentent
  - Preovulatory LH surge plus graduel
  - Ovulation
  - Libération de P4 du CJ

Phase folliculaire

- Lorsque l'ovulation se produit
  - Estradiol et l'inhibin reviennent à un taux basal 1 à 2 jours
  - Signes d'oestrus diminuent 1à 2 jours

Phase luteale

- Ovulation – cessation des chaleurs
- P4 domine
  - Maximum (> 4 ng/ ml) 4 à 7 jour post-ovulation

Luteal Phase

- De faible taux d'oestrogenes secretés par le CJ
- N'accepte pas l'étalon
- Pulses de GnRH unfréquents
- Amplitude des pulses de FSG augmente parraport à ceux de LH

Luteal Phase

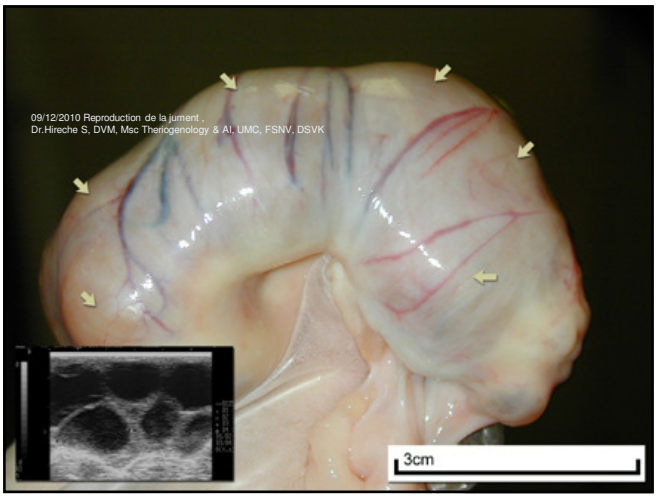
- FSH
  - Maximum pendant le di-oestrus
  - Développement folliculaire
- 1 à 2 vagues folliculaires

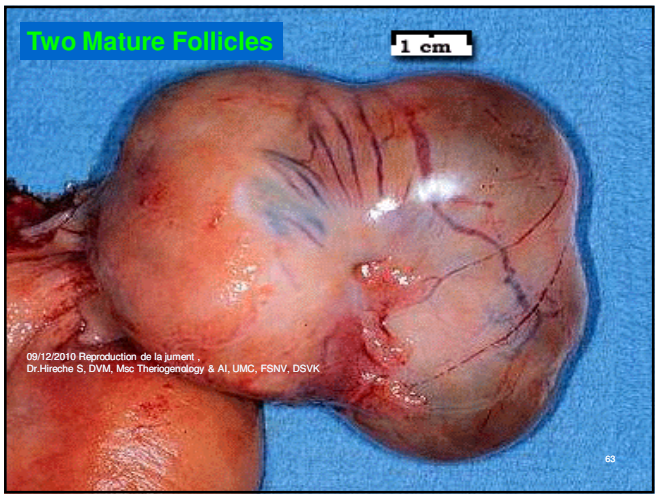
Luteal Phase

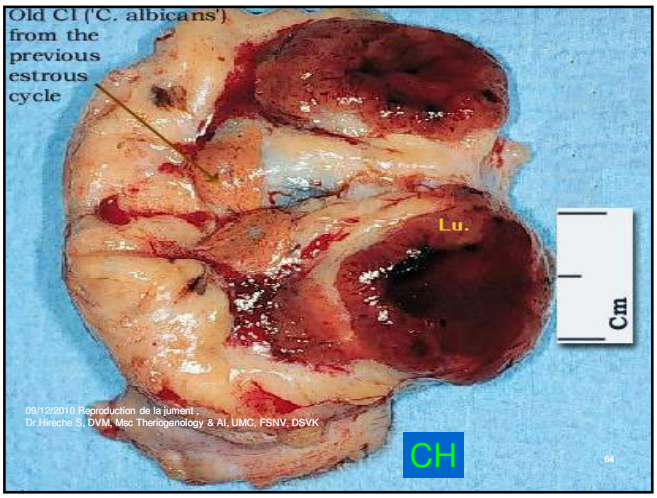
- Pique de PGF2α J14-15 après l'ovulation
  - Lutéolyse
  - Diminution P4
  - Augmentation de l'oestradiol par le follicule dominant
  - Reviens en chaleur 1-3 après régression du corps jaune

Events Of Vernal Transition

- Follicular development
  - Become atretic
- Ends when
  - Normal follicle develops
  - LH gene activation and LH secretion
  - Ovulation occurs







Reproductive Seasonality In Mares

- 15-20% of mares cycle regularly throughout year
- Within a mare seasonal pattern varies from year to year

Photostimulation Of Reproduction Onset

- 14-16 hrs light (artificial and natural) per day
- A minimum of 8-10 weeks for response
- Start Dec 1st to establish normal cycle by Feb 15

Photostimulation Of Reproduction Onset

- Provide light at
  - End of natural light
  - Split and add to beginning and end of natural light
- Mare within 7-8 feet of 200-watt light bulb
- Luminal intensity of 10-12 foot candles

Puberté

- 1ère ovulation
- 12-24 mois
- Facteurs
  - Photoperiodisme
  - Alimentation
  - Pheromones et exposition aux males