

Pregnancy Loss and Parturition

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Updated: 11/26/07

Distribution of Prenatal Losses

- Fertilization → 100%
 - » Under optimal conditions
- 2/3 loss during embryonic development
 - » Imprinting
 - » Compaction
 - » Blastocyst hatching and formation
 - » Failure to prevent CL regression
 - Maternal recognition of pregnancy

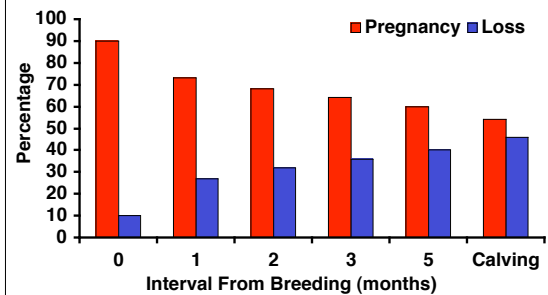
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Distribution of Prenatal Losses (cont.)

- 1/3 loss during fetal stage
 - » Crowding
 - » Placental insufficiencies
 - » Not the fetus directly

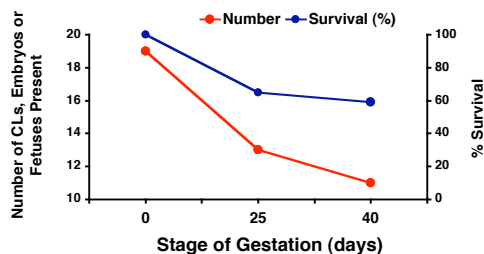
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Embryonic and Fetal Loss in Cattle



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Embryonic and Fetal Loss in Pigs

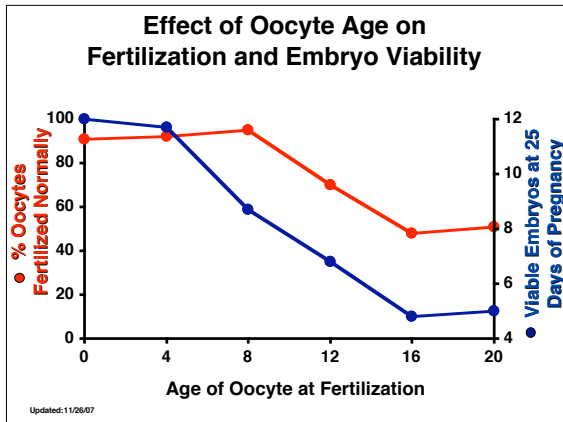


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Increased Prenatal Loss

- Nutritional Stress
 - » Energy shortages
 - » Mineral imbalances
 - » Vitamin deficiencies
- Disease of the reproductive tract
- Endocrine imbalances
- Aging of gametes prior to fertilization

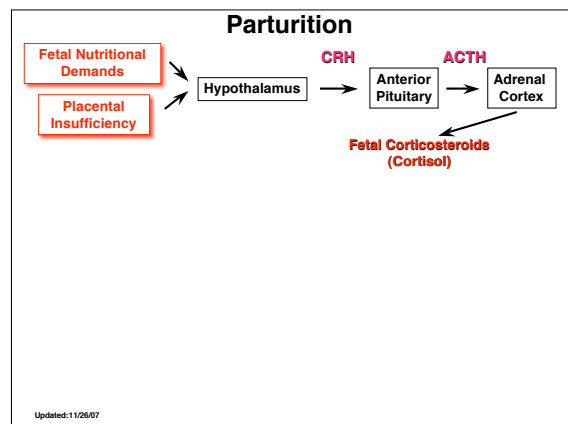
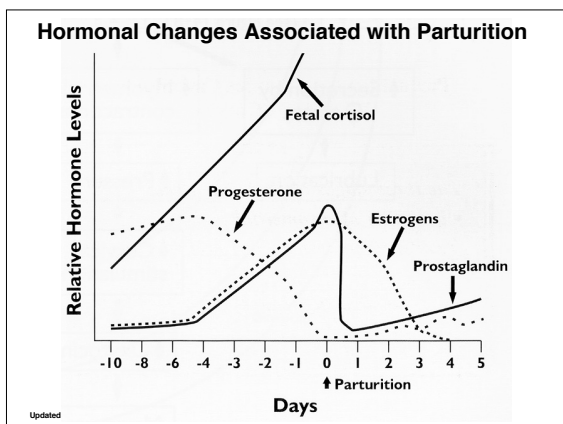
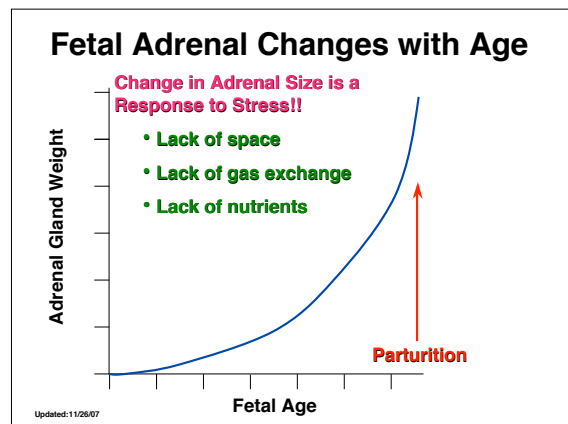
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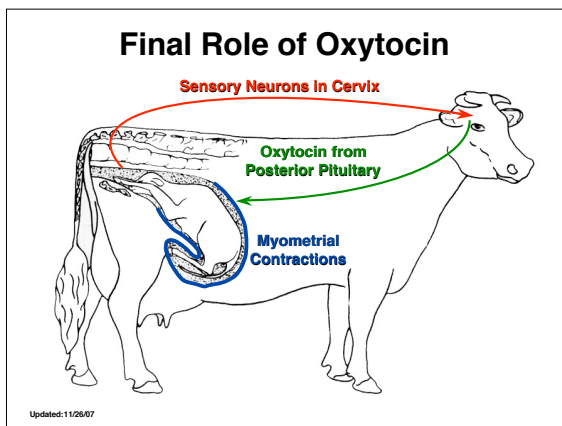
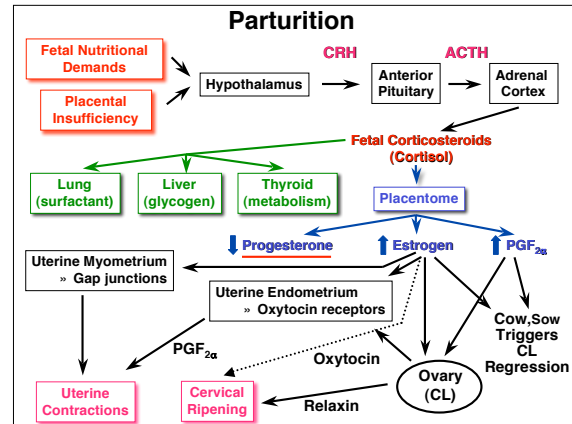
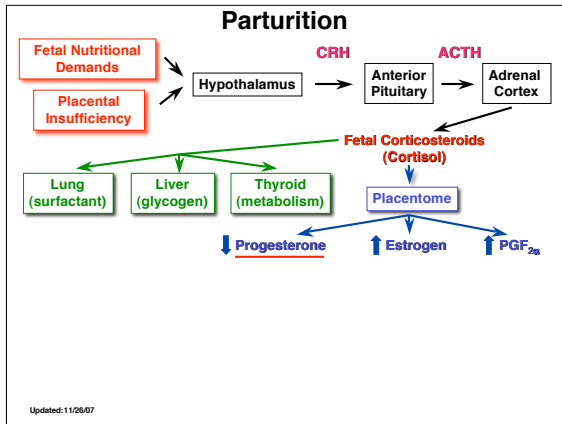


Parturition

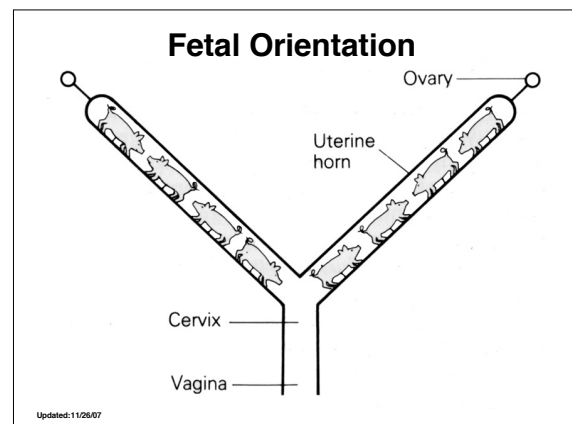
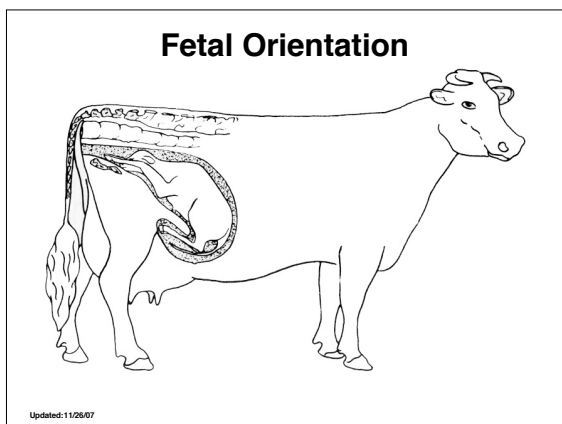
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- ### Mechanism For Parturition
- **Skunk Cabbage**
 - ⇒ Prolonged gestation in Sheep
 - ⇒ hypoplasia of Anterior Pituitary
 - **Gene Defect**
 - ⇒ Autosomal recessive in Holstein cattle
 - ⇒ Large calves, 1-2 months beyond due date
 - ⇒ hypoplasia of Anterior Pituitary
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- ### Orientation of Fetus
- Fetus must reorient prior to parturition
 - » Initially on back
 - » Reorient so feet and head will exit first
 - » Breech
 - Rear of fetus comes first
 - Orientation not important in pig
 - Abnormal orientation results in dystocia
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Stages of Labor

- Preparative (2 to 12 hours)
 - » Myometrial contractions
 - » Uterine pressure
 - » Abdominal discomfort
 - » Cervical dilation

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Stages of Labor (cont.)

- Expulsion of fetus (30 to 180 min)
 - » Strong uterine contractions
 - » Rupture of the allantochorion
 - » Appearance of the amnion
 - » Maternal recumbence and straining
 - » Not only uterine but abdominal contractions as well
 - » Rupture of the amnion and delivery

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Stages of Labor (cont.)

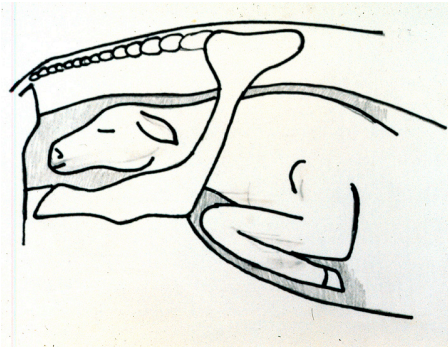
- Expulsion of the placenta (1 to 12 hours)
 - » Uterine contractions
 - » Chorionic villi loosen
 - » Expulsion of the placenta
 - » Delayed in ruminants due to presence of cotyledons separating independently
 - » Suckling induces oxytocin release which triggers further uterine contractions

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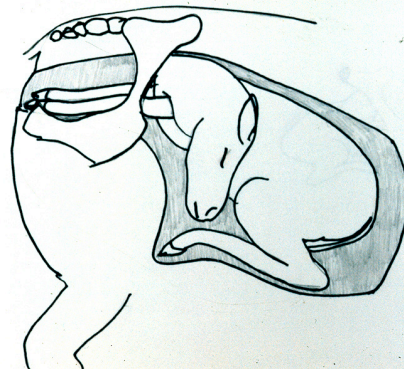
Dystocia

- Difficult birth
- Excessive fetal size (90% for cattle)
- Abnormal presentations (5% for cattle)
- Multiple births (twins)
 - » Twins presented at the same time
 - » One is usually blocking the other
 - » Uterus becomes fatigued

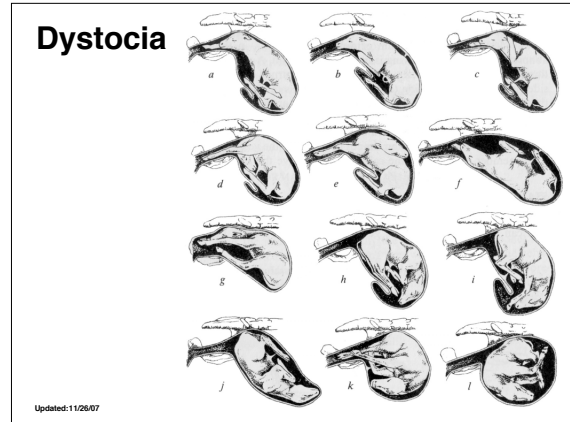
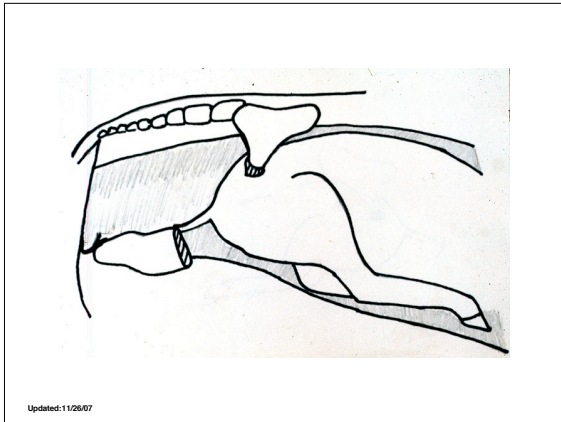
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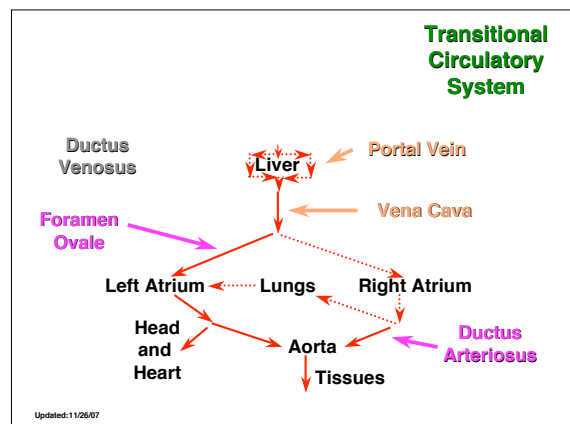
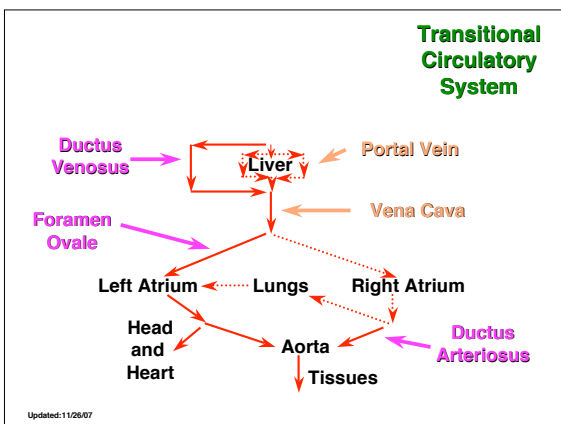
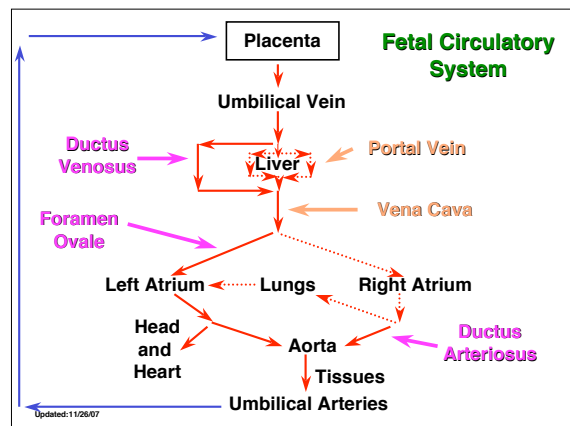
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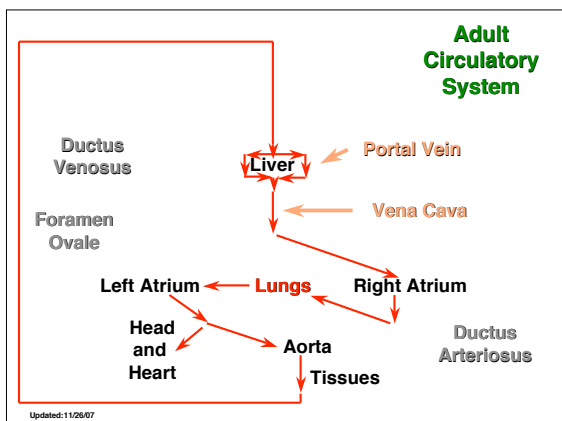
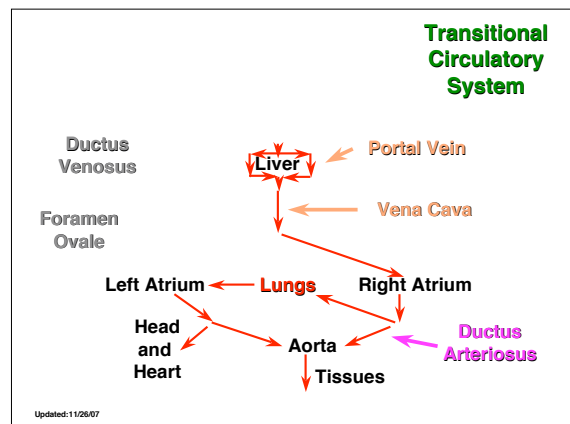
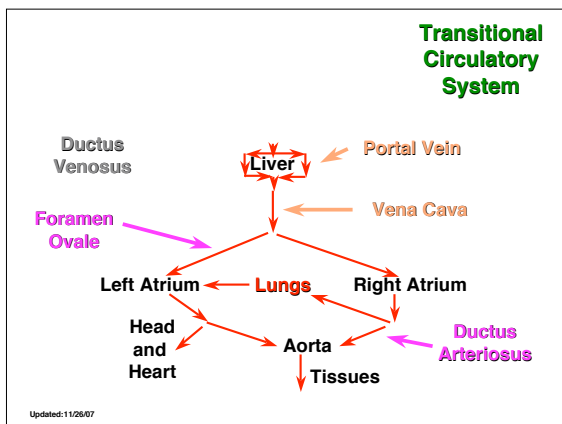
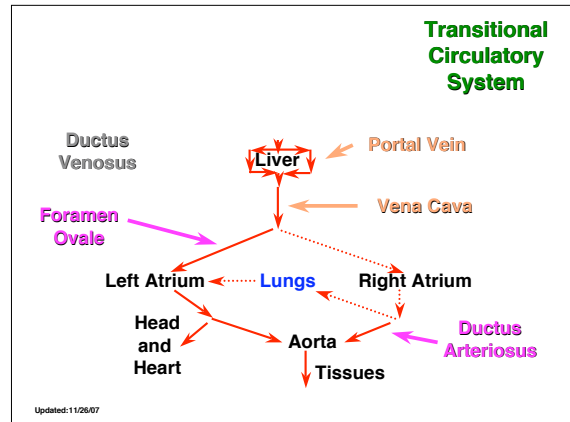
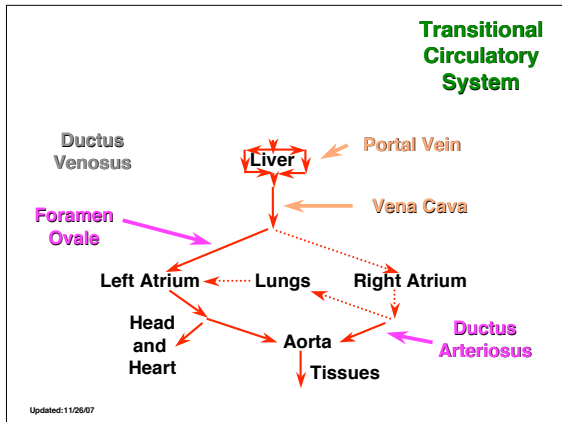


Perinatal Fetal Changes

- Cardiovascular
 - » Ductus arteriosus
 - » Foramen ovale
 - » Ductus venosus

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Perinatal Fetal Changes

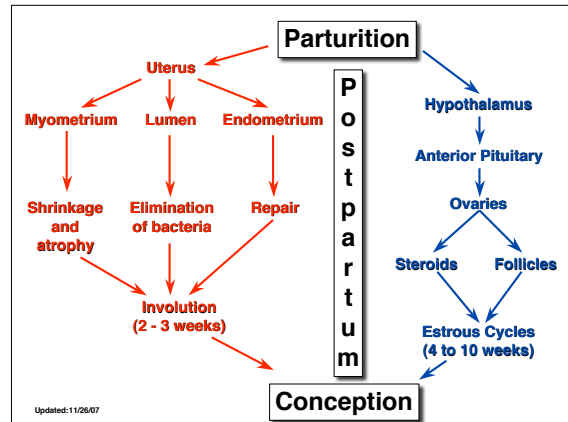
- **Cardiovascular**
 - » Ductus arteriosus
 - » Foramen ovale
 - » Ductus venosus
- **Thermoregulatory**
 - » Must regulate own temperature
 - » Increase metabolism (thyroid activity)
 - » Brown fat - metabolism of produces heat
- **Energy metabolism**
 - » Until suckling, relies on own stores of glycogen

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Perinatal Fetal Changes (cont.)

- Immune status
 - » Has no antibodies to protect
 - » Gets passive immunity from mother
 - Gut permeable to antibodies in colostrum
 - Only first 1 - 2 days
 - In rabbit, rat, man get some antibodies absorbed through placenta

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Return to Estrus

- Fertility increases with # of estrous cycles
 - » First = 35% pregnancy rate
 - » Second = 50%
 - » Third = 73%
 - » Fourth = 72%
- Lactational anestrus or Lactational amenorrhea

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Return to Estrus (cont.)

- Special postpartum estrus
 - » Mare - foal heat, 6 - 13 days postpartum
 - Fertility depends on body condition
 - » Sow
 - Anovulatory estrus 3 - 5 days post-farrowing
 - Weaning induces estrus 3 - 5 days latter

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Retained Placenta

- Definition
 - » If not expelled within 24 hr it may be retained for 5 - 6 days
- Most common in cattle (5 - 15 %)
 - » Not seen in sows or ewes
 - » Sometimes seen in mares (retained = > 4 hrs)

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Equine Retained Placenta



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Retained Placenta (cont.)

- **Cause**
 - » Normally get lack of blood flow to chorionic villi and this causes them to regress
 - » High incidence in premature or early delivery
 - » High milk producers
 - » Twins
 - » Dystocia
 - » Induction of parturition
 - » Nutritional deficiencies
 - Vitamin A
 - Selenium

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Retained Placenta (cont.)

- **Treatment**
 - » Manual removal not recommended
 - » Daily antibiotics
 - » Large single antibiotic bolus
 - » Oxytocin or PGF
- **Major concerns in humans and mares**
 - » Can cause death of mother from septicemia

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Induction of Parturition

- **Dexamethazone**
 - » Potent synthetic cortisol
 - » Works in all species
 - » Takes 2 to 3 days
- **PGF_{2α}**
 - » Swine, cattle and sheep
- **Oxytocin**
 - » Human, horse

Review Remaining Slides for Species Specific Procedures!

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Cow

- Do not induce before last 7-14 Days of gestation

Method:

Dexamethasone - parturition in 48 hours, 20-50 mg/IM
Azium (trade name) combined with 25 mg Lutalyse induces within 35±2 hours. Requires a live fetus to work and does not work on a mummified fetus

- High incidence of retained placentas and lower postpartum fertility (severity increases the earlier induced).
- Retained placenta is not problem if treated properly
- Giving estrogen before induction of parturition ↓ incidence

Prostaglandins used in cases of a mummified fetus and are also effective in inducing abortion the first 4-5 months

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Sheep - Best within a few days of parturition

Dexamethasone (8-20 mg) Parturition in 24-72 hours

Retained placenta not a problem

Can use Lutalyse to abort before Day 50 of gestation

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Sow - Do after day 111 of gestation

Note that this is less than 3 Days from normal parturition

PGF_{2α} (Lutalyse 10 mg/IM) parturition in 29-48 hours.

Close synchrony - Lutalyse at 8 AM followed by oxytocin 40 IU 24 hours later. Sows farrow between 8 AM and 5 PM (32 hours from start)

Piglets should be born within 1 to 8 (average 1-4) hours with 15 minute intervals between piglets

- May give oxytocin in last few piglets to decrease stillborn numbers in large litters or after extended delivery interval

Its is important to give PGF_{2α} no earlier than Day 111. If given on Day 110 will cause stillborn piglets (too immature to survive)

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Mare - Do after day 320 of gestation

Oxytocin (20-60 I.U.) close to term !!!

Takes less than 1 hour!

Placenta expelled in < 1 hour

Make sure of the following before inducing foaling:

1. Udder is enlarged with presence of colostrum
2. There is relaxation of the perineal region
3. Cervical relaxation (can insert 1 to 2 fingers)

Usually induce for only two reasons:

1. Demonstration
2. Prolonged gestation

In normal pregnancy, mare can control time of day for foaling through her release of oxytocin. Inject oxytocin give no choice of time

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