



NORMAL PARTURITION

Parturition: is a process of giving birth and expulsing the mature fetus from security intrauterine environment into the harsher outside world. It is also called Eutocia, birth, and delivery. Preparation for parturition involves coordinated changes in both mother and fetus:

1. The mother must develop the ability to produce and eject milk to feed the newborn. In some species, she must develop nest building or a safe place.
2. The uterus must be getting rid of the progesterone effect and stimulated to undergo contraction.
3. The fetus must develop the ability to respiration, circulate blood to and from the lungs, metabolize milk products, regulate its body temperature, immune protection from its new environment, and other essential functions.

Table 1 deferent terms of fetal expulsion

Term	Pregnancy period	Type of parturition	Life of newborn
Eutocia	Normal	Normal	Alive and hale
Dystocia	Normal or (\pm)	Difficult	Alive or dead
Stillbirth	Normal or (\pm)	Normal or difficult	Dead, or alive but most times dies after birth
Premature	Before 1 or 2 months from normal	Normal or difficult	alive but need a special care
Abortion	during any time after maternal recognition of pregnancy	Normal or difficult	dead



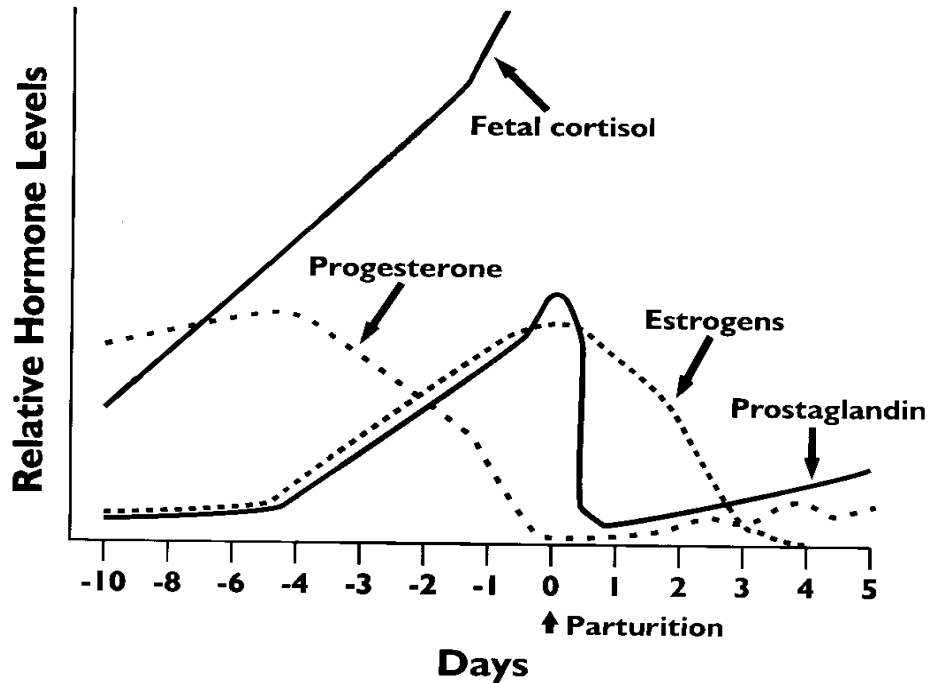
Mechanisms initiating parturition:

For delivery to occur the uterus must undergo massive contraction and the birth canal (cervix, and pelvis in some species) must be opened. For this to happen, a progesterone block of the uterus must be removed. In species such as cattle, equine, and swine where progesterone is from the corpus luteum, regression of the corpus luteum must occur. In species such as sheep where progesterone is from the placenta, this production must be stopped.

Fetal stress occurs due to lack of space, lack of nutrition, and gas exchange (O_2 and CO_2) leading to:

1. Corticotrophin Releasing Factor (CRF) or (CRH) is released from the fetal **hypothalamus**
2. ACTH is released from the fetal **pituitary**
3. **Cortisol** is released from the cortex of the fetal **adrenals**.

4. Fetal cortisol promotes the removal of the “progesterone block”
 Enzymes are produced by the placenta (17α -hydroxylase, Aromatase, $17-20$ lyase enzyme) which converts placental progesterone to estradiol (therefore, the level of progesterone decreases and the level of estradiol increases). The formation of prostaglandins is promoted by enzymes sensitive to the decrease in progesterone and the increase in estradiol. Therefore, $PGF_{2\alpha}$ is produced and regression begins, resulting in a further decrease in progesterone. Estradiol and $PGF_{2\alpha}$ promote myometrial contractions.

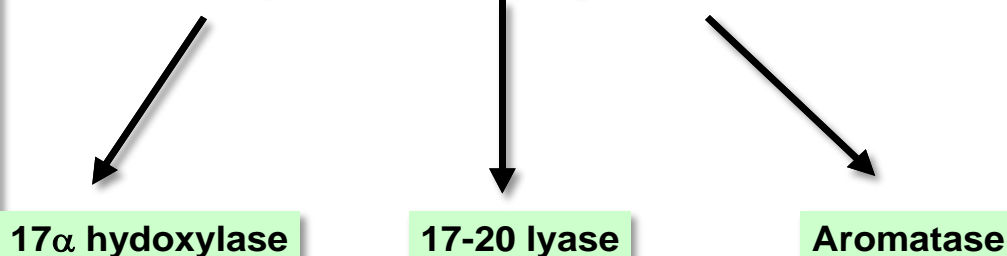


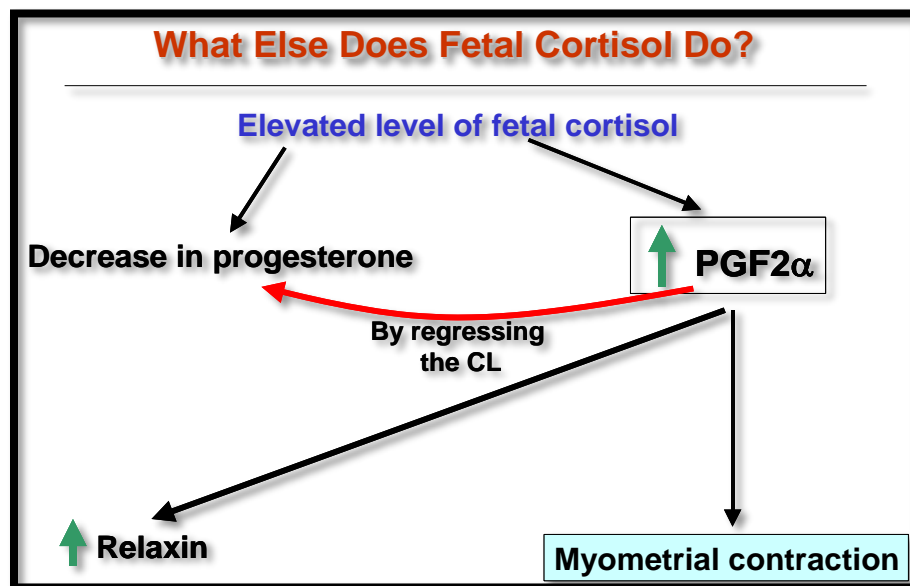
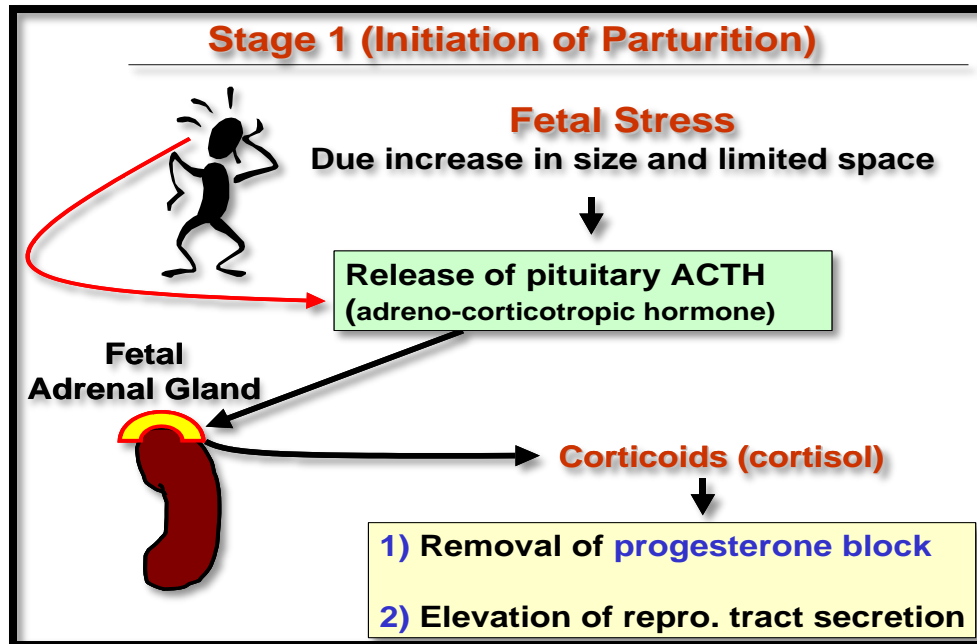
Removal of Progesterone Block

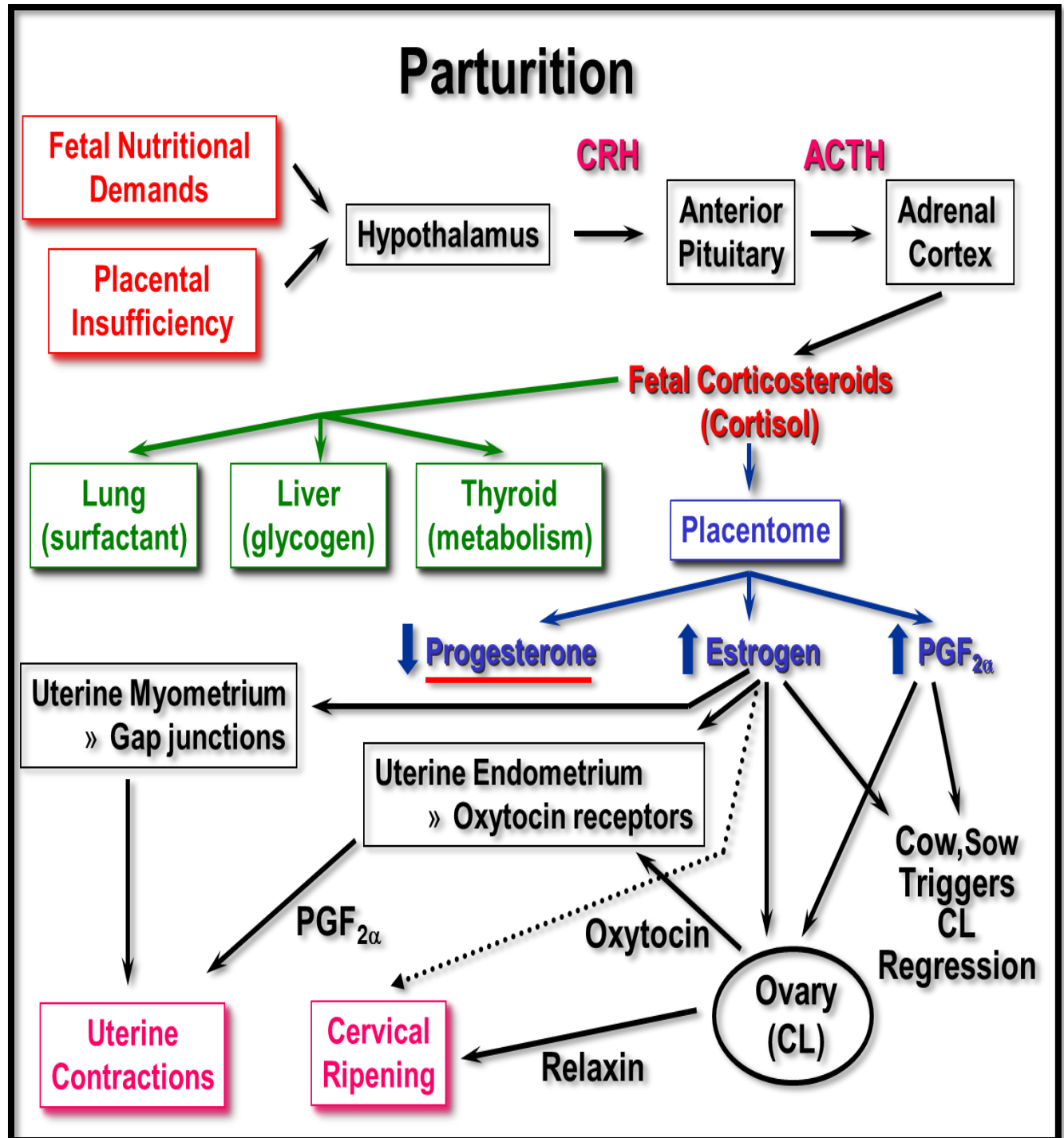
How does progesterone secretion is inhibited?

Elevated cortisol promotes the synthesis of 3 enzymes

These **3 enzymes** convert progesterone to estradiol









Stages of Parturition: There are three stages to parturition:

Stage 1: Dilation of the Cervix: (takes many days to complete).

1. Uterine contractions (uterine 90%, abdominal contraction 10%).
2. Regular contraction of the uterus pushes the fetal fluids and membranes against a relaxed cervix causing it to dilate.
3. Uterine contractions are stimulated by neural mechanisms and smooth muscle.
4. A thick clear mucus “string” hangs from the vagina.
5. Decreased appetite

Stage 2: Expulsion of the fetus:

- This stage is characterized by violent contractions of the diaphragm and abdominal muscles as well as the myometrium.
- In ruminants, the fetus is expelled while attached to the umbilical cord and placenta.
- However, in swine and horses, the placental connections are often broken before delivery. Therefore, live birth in these species is dependent on rapid delivery.
- This stage officially begins with the appearance of membranes (water bags) at the vulva. Start your clock at this time: traditionally the calf should be delivered within 2 to 5 hours of the moment you first see the water bag.

Stage 3: Expulsion of the fetal membranes:

- The placenta should be shed within 8 to 12 hours of the calf's delivery.