Presentation 1: Reproductive Endocrinology of the Cow

- The estrus cycle, evaluation of the non-pregnant cow
GnRH from where to do what?
LH & FSH?
Progesterone (P4)?
Estradiol (E2)?
Inhibin?
Prostaglandins?
What clinical changes would you expect at different stages of the estrous cycle?

**Estrus:**

**Hormones?**
- E2

**Uterus?**
- Toned

**Ovaries?**
- Large follicle, old, small CL from previous cycle

**Behavior?**
- Standing heat
What clinical changes would you expect at different stages of the estrous cycle?

Luteal Phase:

Hormones?
- P4 (also waves of E2 and inhibin from developing follicles)

Uterus?
- Edematous early to flaccid late

Ovaries?
- Maybe ovulation depression very early, CL palpable by day 5, multiple follicles will develop and regress
What clinical changes would you expect at different stages of the estrous cycle?

Follicular Phase:

Hormones?  • Increasing E2

Uterus?    • Increasing tone

Ovaries?   • CL rapidly regresses, concurrent increase in diameter of pre-ovulatory follicle
CLs
Follicles
Cysts

> 2.5 cm

Is this a pathologic cyst?
Time for Questions!

• If you have a herd of 100 cows, how many cows should be in heat on any given day?
• If you have a herd of 100 mature cows, how many would you expect to have high serum progesterone?

(1/20 is 0.05 or 5%. Therefore, 5% of 100 is 5, so 5 cows should be in heat)
(2/3 or 66 cows, because the CL is producing P4 in the luteal phase, approximately 2/3 of the estrous cycle)
• What is the #1 sign that a cow is in estrus?
  • name 3 supporting signs.
  • name some factors that would inhibit showing signs of estrus.

• Average period of estrus behavior lasts how long in beef cows? dairy cows?

(Standing Heat. Supporting: mounting other cows, bellowing, jumping fences and doing the tango with Erin’s car, mucus, etc.)

(About 15 hours, range from 6-24. Beef longer than dairy?)
• What is the most common cause of anestrus?

• Another common reason?

• What is a cause of persistent estrus/nymphomania?

(Pregnancy!)

(Ovarian cysts, Free Martinism…how can you test for that?)

(Ovarian cysts again, uncommonly a cyst will produce high levels of estrogen)
• What is the most common treatment for cystic ovaries and explain the rationale.

(GnRH or hCG induce luteinization→return to estrus in 21 days
OR give PGF2a 9 days after GnRH to shorten interval to estrus)
• What hormones are secreted from the bovine CL?
• From the follicle?
• From the endometrium?

(P4, oxytocin, neurophysin)
(E2, inhibin)
(PGF)
• What is the average age range of onset of puberty?

• In what type of cattle would you expect onset of puberty to be later?

(8-19 months)
(Bos indicus, 17-19 months)
• What class of hormone includes GnRH and oxytocin?
  • LH and FSH?
  • progesterone?
  • prostaglandin?

(peptide)
(glycoprotein)
(steroid)
• http://www.vetmed.lsue.edu/eiltslotus/theriogenology-5361/Bovine%20Index.htm

• http://beef.unl.edu/learningmodules.shtml

• http://www.drostproject.vetmed.ufl.edu/

• http://www.vet.ksu.edu/media/images/therio/