Animal/Dairy Science 434
Lec 2:
Female comparative anatomy;
History of Reproductive Physiology

Kangaroo
- Ovaries
- Uterus
- Vagina
- Bladder opening

Rat
- Ovarian horns
- Vagina
- Urogenital sinus

Human
- Ovaries
- Uterus
- Vagina

Cow
- Cortex on outside
- Ovulation can occur on any point of the ovary

Sow
- Cortex on outside
- Ovulation can occur on any point of the ovary

Mare
- Inversion of the cortex and medulla
- Ovulation occurs at the Ovulation Fossa

Ovarian Differences

Cow
- Ovulation occurs at the Ovulation Fossa
- CL (Corpus Luteum)
- Blood vessels and connective tissue in medulla

Mare
- Ovulation occurs at the Ovulation Fossa
- CL (Corpus Luteum)
- Blood vessels and connective tissue in medulla

Cow, Sow, Ewe, Human
- Cortex on outside
- Ovulation can occur on any point of the ovary

Uterine and Cervical Differences

Cow
- 2 Uterine Horns
- 2 Cervixes
- 2 Vaginas

Sow
- 2 Uterine Horns
- 1 Vagina

Mare
- 1 Uterine Body
- 2 Uterine Horns

Duplex

Opossum
- 2 Uterine Horns
- 2 Cervixes
- 2 Vaginas

Rabbit, Mouse
- 2 Uterine Horns
- 2 Cervixes
- 1 Vagina

Bicornuate

Ewe
- Smaller uterine horns

Cow
- 1 Uterine Body
- 2 Uterine Horns
- 1 Vagina
- 1 Cervix

Sow
- Large uterine horns
- 1 Vagina
- 1 Cervix
A 47-year old woman underwent a hysterectomy for excessively heavy menses. She had previously had four normal deliveries. This structure was removed, what is wrong?
Cervix

- Cervix is composed of thick connective tissue
- Cervix has 4-5 annular rings

Cow

- Uterine Body
- Internal Cervical Os
- External Cervical Os

- Mucus is secreted near the time of breeding and ovulation.

Mare

- Uterine Body
- No obstacles
- Interdigitating pads
- Fornix Vagina

Sow

- Uterine Body
- No fornix vagina

Mare

- Uterine Body
- Longitudinal Folds
- Cervical Folds
- FV

What is this?
Human Tract

External Genitalia

Vagina

Avian Female Anatomy

Chicken Tract

Chicken Ovary

Left side of Reproductive Tract Develops!!

Species: Human

- Anterior Vagina
- Posterior Vagina (Vestibule)
- Columnar Epithelium
- Stratified Squamous Epithelium
- Urethra
- Submucosa
- Cervix
- Vagina
- Infundibulum
- Oviduct
- Magnum
- Shell Gland
- Ovary
- Peritelline membrane
- Chalazae
- Albumen
- Shell membrane
- Cleaving blastodisc
- 24 hrs 50K cells
- 24 hrs 50K cells
- Shell
- Intestine
- Cloaca
- Right Oviduct
- Magnum
- Isthmus
- Uterus
- Oviduct
- Shell Gland
- Intestine
- Ovary
- Egg

Species: Chicken

- Ovary
- Magnum
- Shell Gland
- Intestine
- Hierarchal Follicles

Other Species

- Labia
- Clitoris
- Urethra
- Hymen
- Vaginal Orifice
- Anus
- Vulva
- Vaginal Sphincter (Hymen)
- Left side of Reproductive Tract Develops!!
- Right Oviduct
- Chicken Ovary
- Hierarchal Follicles
Ovary with large follicles removed

Ruptured follicle

Chicken Reproductive Tract

Infundibulum

Magnum

Isthmus

Shell Gland

Cloaca

Follicles

Historical Development of Reproductive Physiology

Aristotle 384-322 BC

Generation of Animals

- Fetus arises from menstrual blood
- Seminal plasma initiates the conversion of menstrual blood
- Semen from all parts of body
The Age of Gross Anatomy

- Fallopius (1562)
  - Describes the oviduct
- Coiter (1573)
  - Describes the corpus luteum
- Regnier de Graff (1672)
  - Describes the antral follicle (Graafian Follicle)

Development of the Microscope

- van Leeuwenhoek (1677)
  - Describes spermatozoa in semen

What is the role of spermatozoa?

- Spallanzani (1780)
  - Sperm were the fertilizing agent in semen
  - Successful artificial insemination of a dog
- Dumas (1825)
  - Proves sperm the fertilizing agent

Modern Reprod. Physiology

- Gonads produce steroid hormones
- Regulation of estrous cycles in females
- Radioimmunoassay (RIA)
- Artificial Insemination
- Cryopreservation
- Prostaglandin used to control estrous cycles
- Biotechnology

Approach to Applications

- Develop basic knowledge of how system works
- Investigate methods that can perturb the system
- Manipulate the system to improve reproduction
  - Estrus Synchronization

Enhancing Reproduction

- Small improvements have profound effects on production
  - 3% improvement in birth rate results in an additional:
    - 1 million beef calves/year
    - 3.2 million pigs/year
    - 3.7 million gallons of milk/year
Current Trends

- Production
- Metabolic and Physiologic Changes
- Reproduction

• Continuing need to:
  – improve reproductive performance
  – understand how to apply new technology
• Ovsynch
• Clonning

Limiting Reproduction

- Humans
- Insects
- Pets
- Wildlife