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# Bovine Reproductive Anatomy

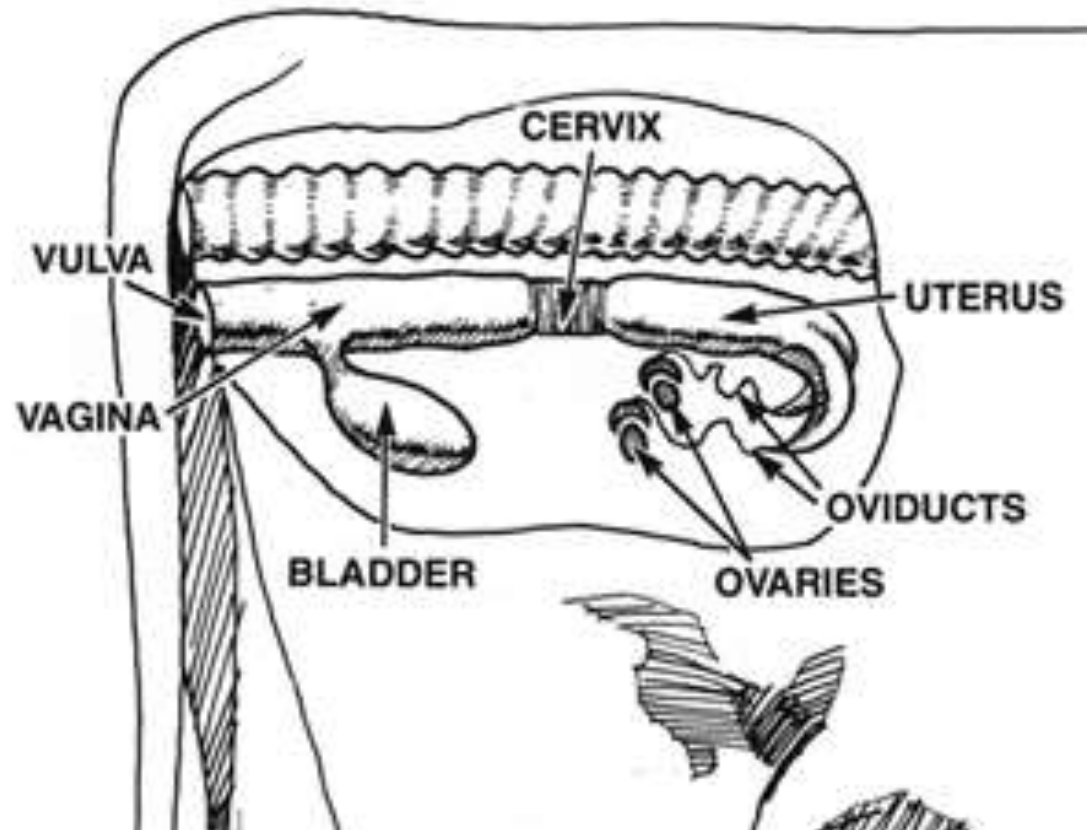
# BASIC ANATOMY OF THE COWS REPRODUCTIVE SYSTEM

- The cow's reproductive system has four basic functions.
  - To produce ova (eggs) which provides half of the eventual offspring's genetic makeup.
  - To provide an environment and conditions for the fertilization of those ova.
  - To provide a place following fertilization for the nourishment and fetal development of the calf.
  - To provide a mechanism for the birth of the calf.

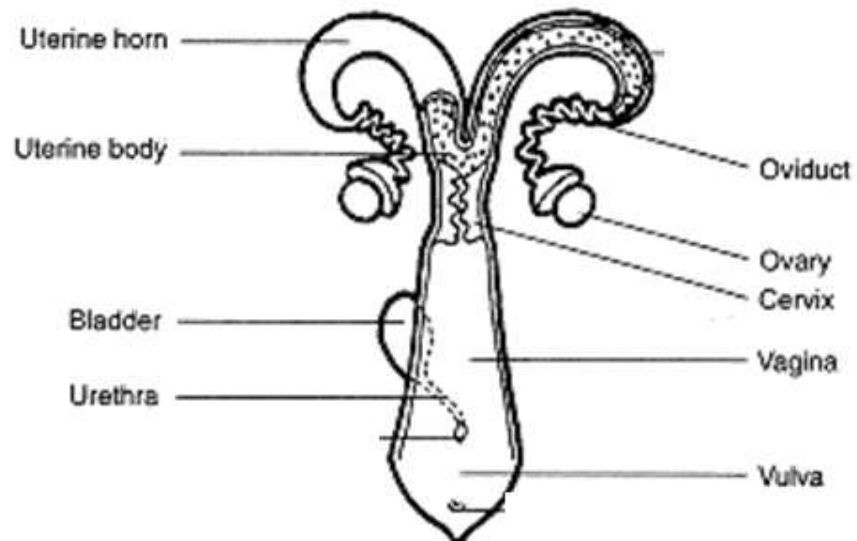
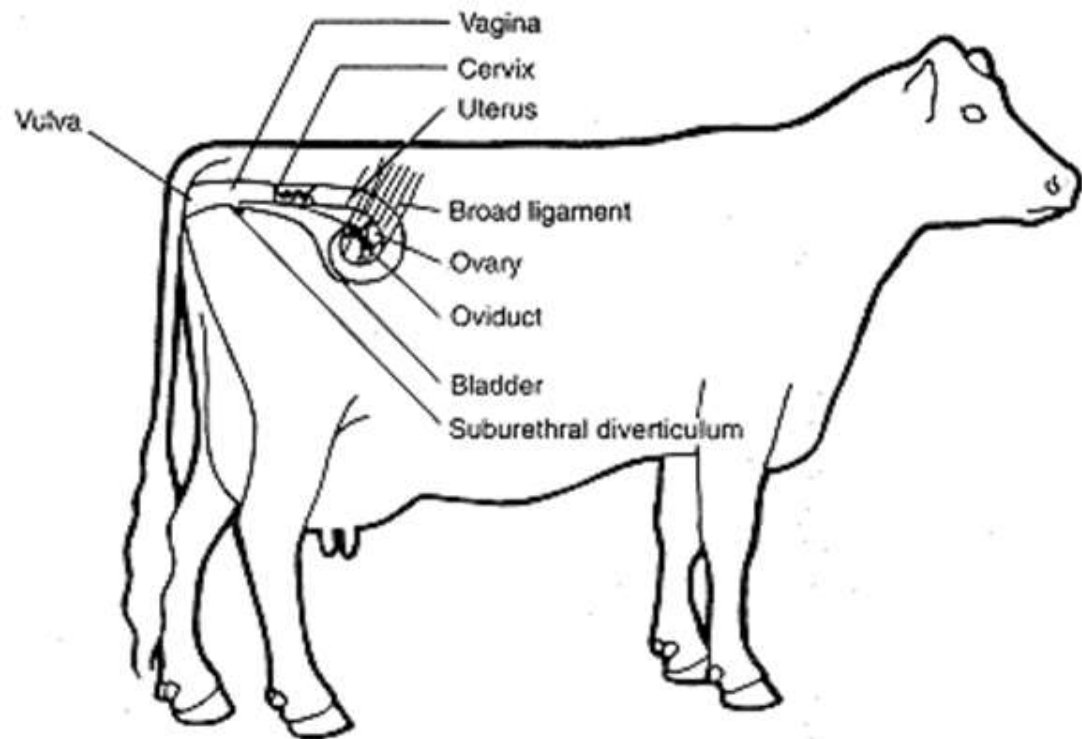
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# Female Repro Structures

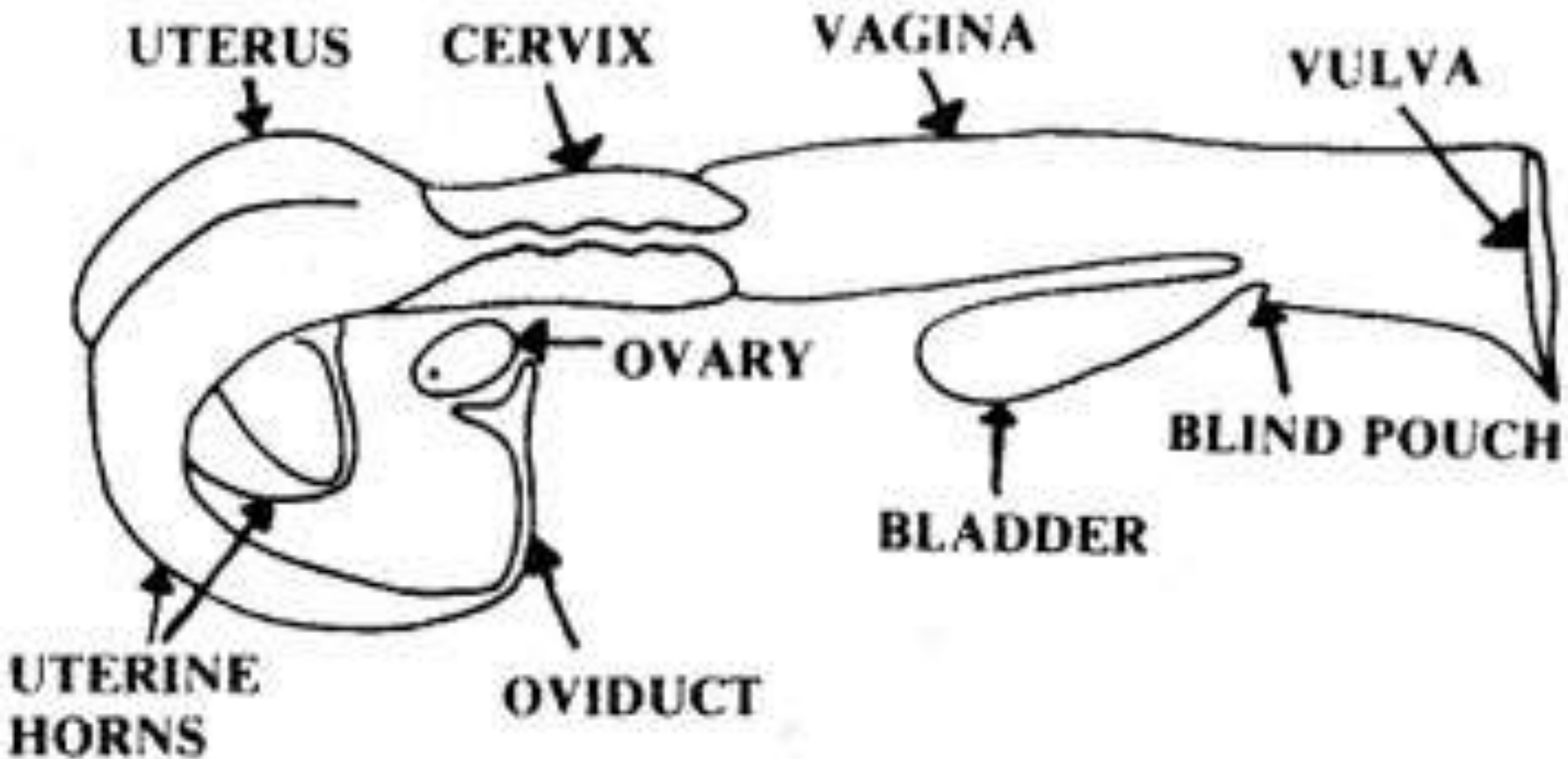
- Vulva
- Vagina
- Cervix
- Uterus
- Oviducts & Infundibulum
- Ovaries
- Corpus Luteum
- Follicles & Eggs



*~ Look at this picture & predict structure function*

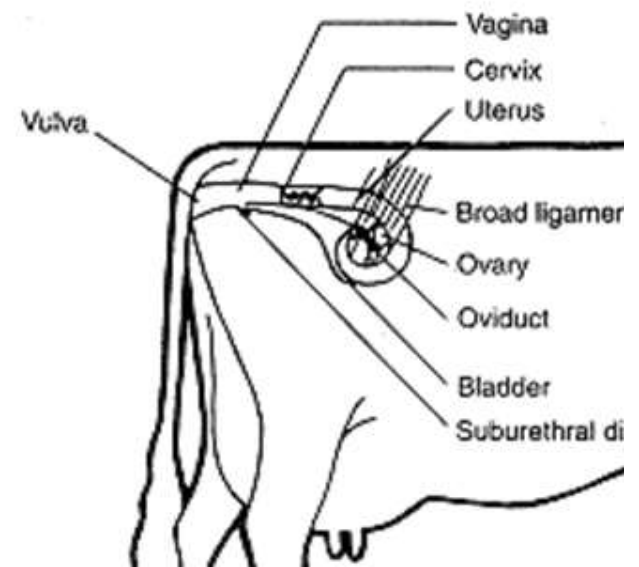
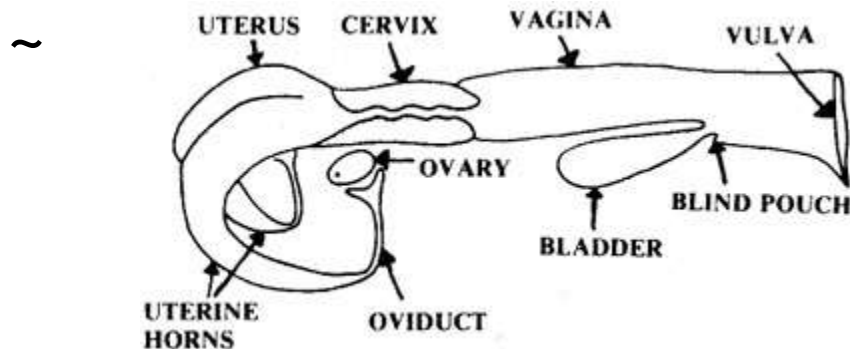


# Map of the Bovine Repro Tract



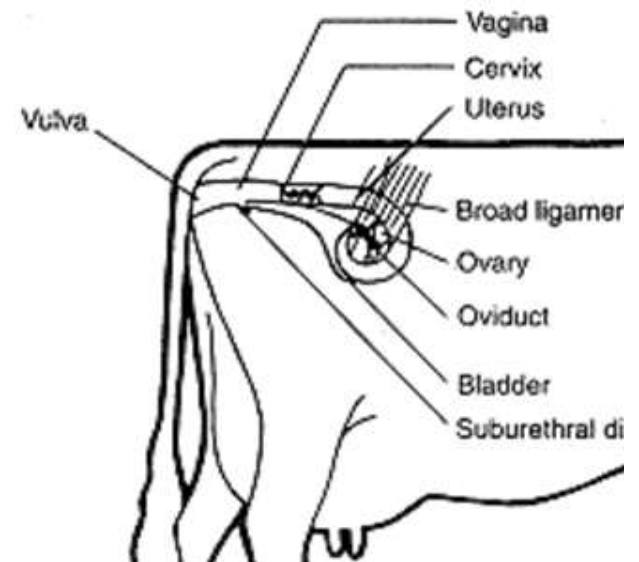
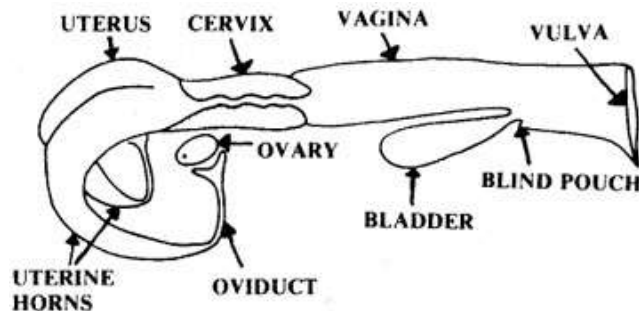
# Vulva

- “Entranceway” of the female reproductive tract
- Only part visible from the outside
- Swells and becomes reddish-pink during estrus
- Response due to estrogen



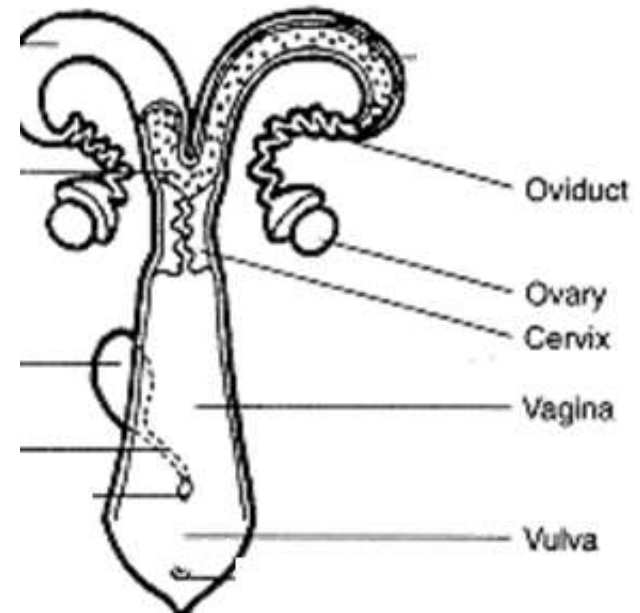
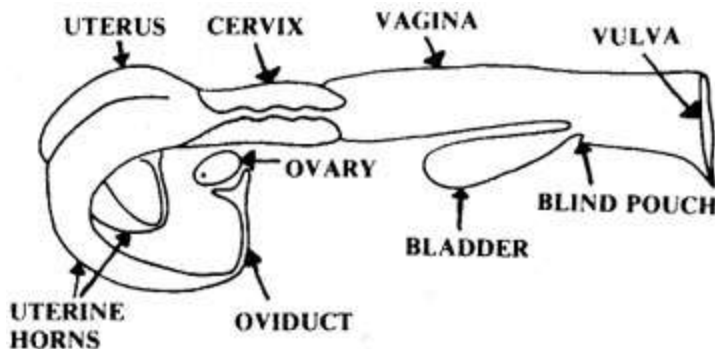
# Vagina

- Vagina – flattened tube; passage between the cervix and the vulva
- Site of semen deposition during natural insemination
- Used as passageway for instruments during AI
- Produces mucus (lubricant)  
*- flushes out irritants and infectious agents*
- Common site of infection



# Cervix

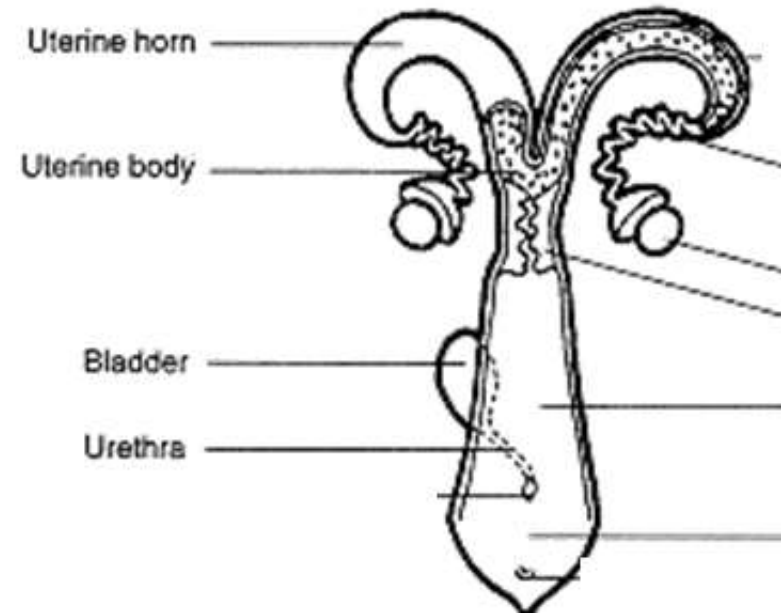
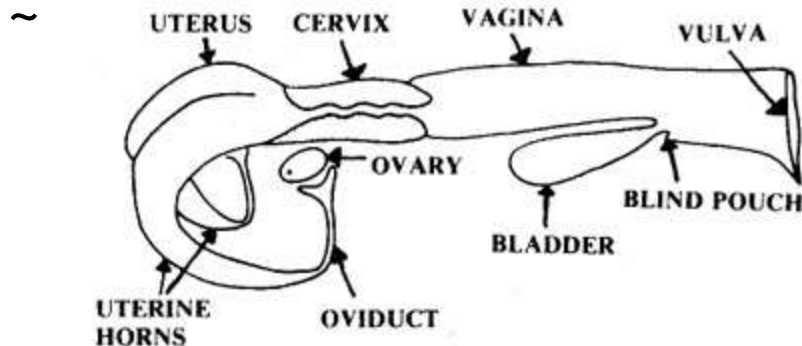
- Cervix – the muscular “valve” or “control gate” between the uterus and the vagina
- Made of muscular folds that slow down invading materials
  - These folds have ‘dead ends’ that trap foreign substances
- Completely closed except during estrus and parturition (calving)
  - During pregnancy, a hard mucus plug “glues” it shut





# Uterus & Uterine Horns

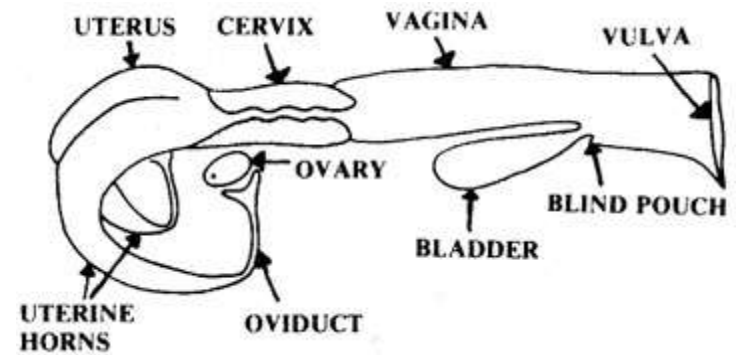
- Uterus – where the fetus grows, a.k.a. womb
  - Muscular, capable of “enormous expansion”
  - Has to support up to 80 kg / 177 lbs of weight
- Uterine Horns
  - The extensions on either side of the uterus that lead to the oviducts
  - Curl like ram horns



# Oviducts (Fallopian Tubes)

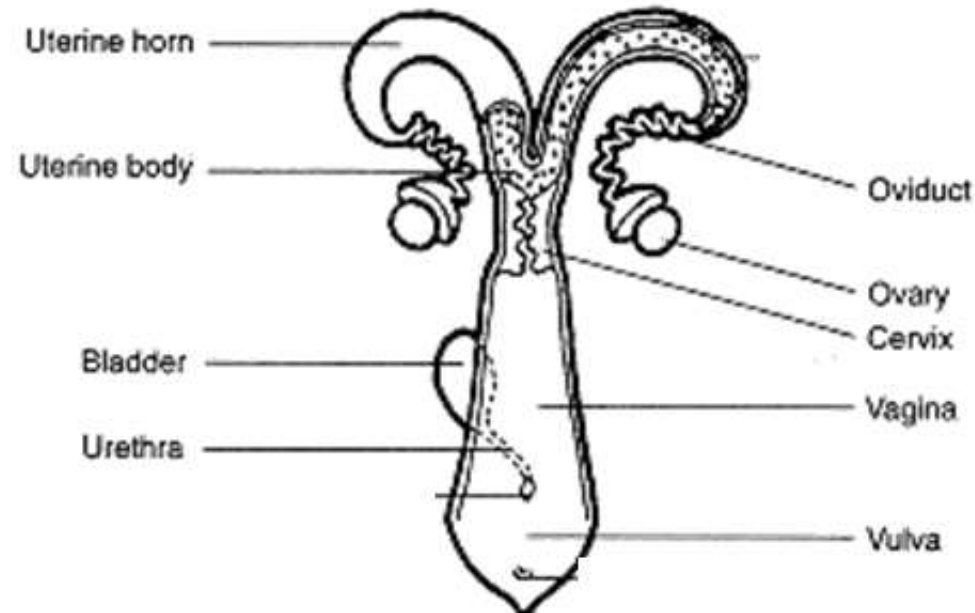
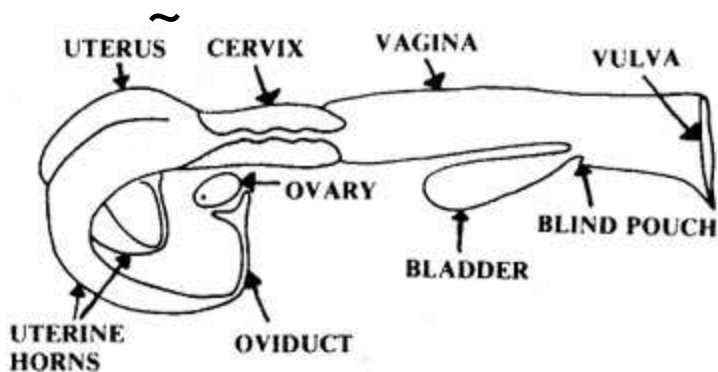
- Oviducts— tubes that carry eggs from ovaries to uterus
- Kept shut tight except during ovulation and insemination
- Where fertilization occurs
  - Egg moved from the ovaries down the oviduct by cilia (microscopic hairs)
  - Motile sperm meet the egg in the upper part of the oviduct
  - Newly formed zygote stays in the oviduct 3-4 days
  - This time is needed for the uterus to prepare itself

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# Infundibulum

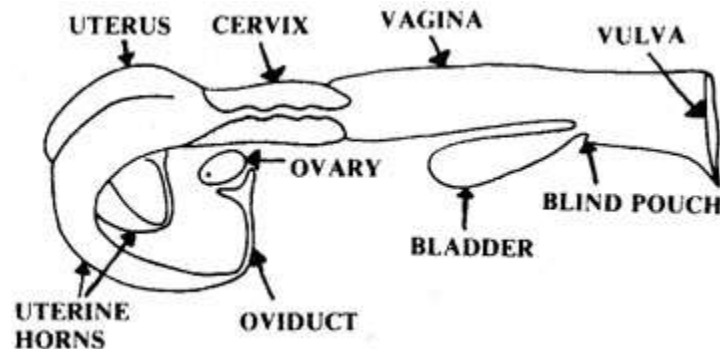
- Infundibulum – Latin for “funnel”
- The end projection of the oviducts that surrounds, but does not connect to, the ovaries
- “Funnels” eggs from ovaries into oviduct.



# Ovaries

- Small walnut-shaped ovals 4-6 cm / 2-3 inches in length
- Contain thousands of ova (plural of ovum, or egg cell)
  - These were created before the birth of the cow
  - Has a finite supply, as do human females

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# Ovaries (cont.)

- Functions:
  - Produce a mature ovum (egg) every 21 days
  - Produce/secrete hormones that:
    - Control growth of egg
    - Change cow's behavior (gets her "in the mood")
    - Prepare reproductive tract for pregnancy
    - Start parturition process (birthing)
    - Prepare mammary glands for lactation

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# Follicles

- Follicles – start as cavities (holes) on the ovary
  - An egg moves to this cavity.
  - It is surrounded by support cells and nutritive substances
- All these things together are the follicle

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# Corpus luteum

- The cells that remain in the follicle after the egg is ovulated (expelled into the oviduct) become the corpus luteum (CL)
- Corpus luteum translated = yellow body
- Produces progesterone, a hormone which sustains the pregnancy (allows pregnancy to “progress”)
- Occurs regardless of fertilization

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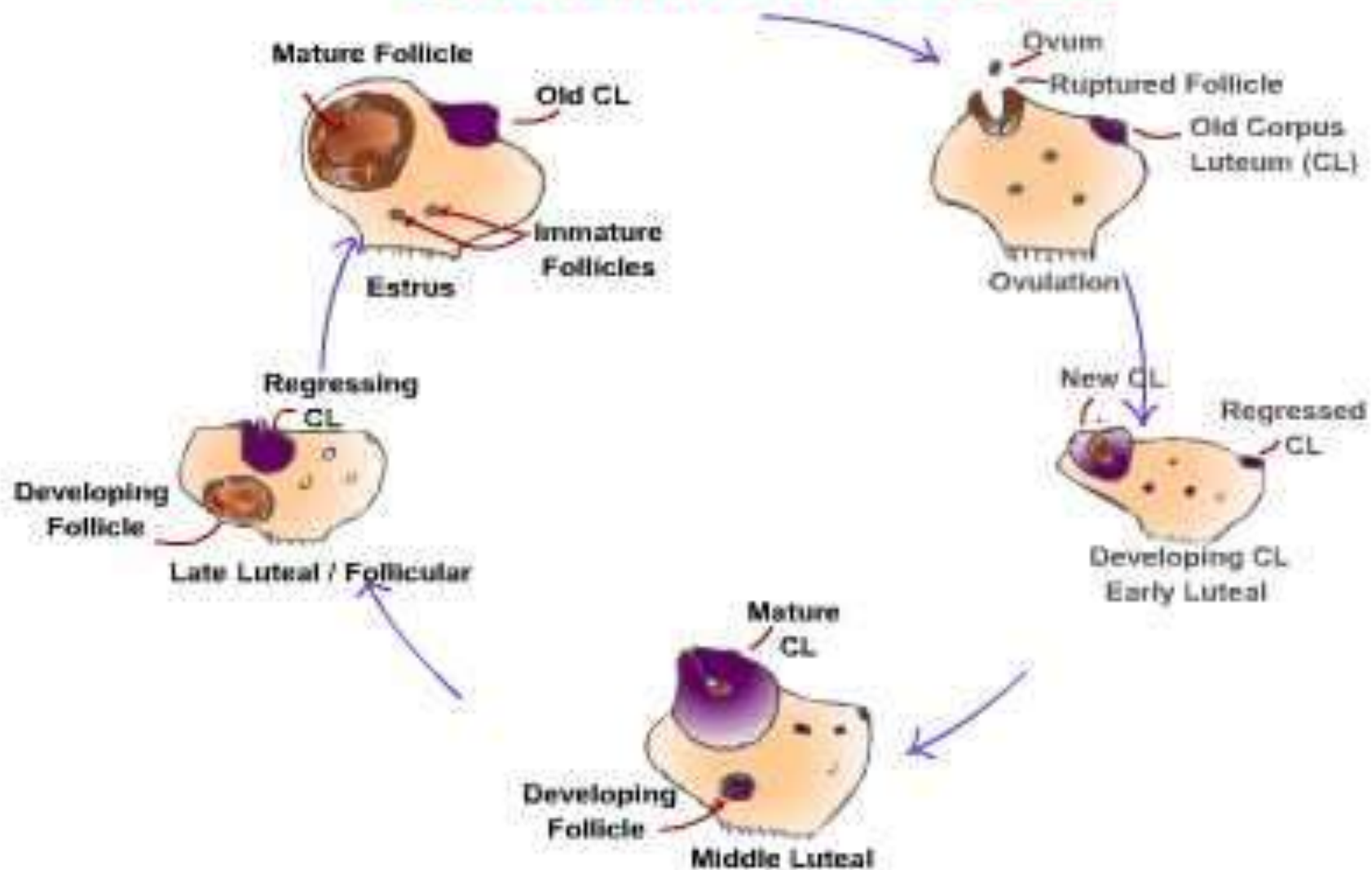
# Egg (ovum)

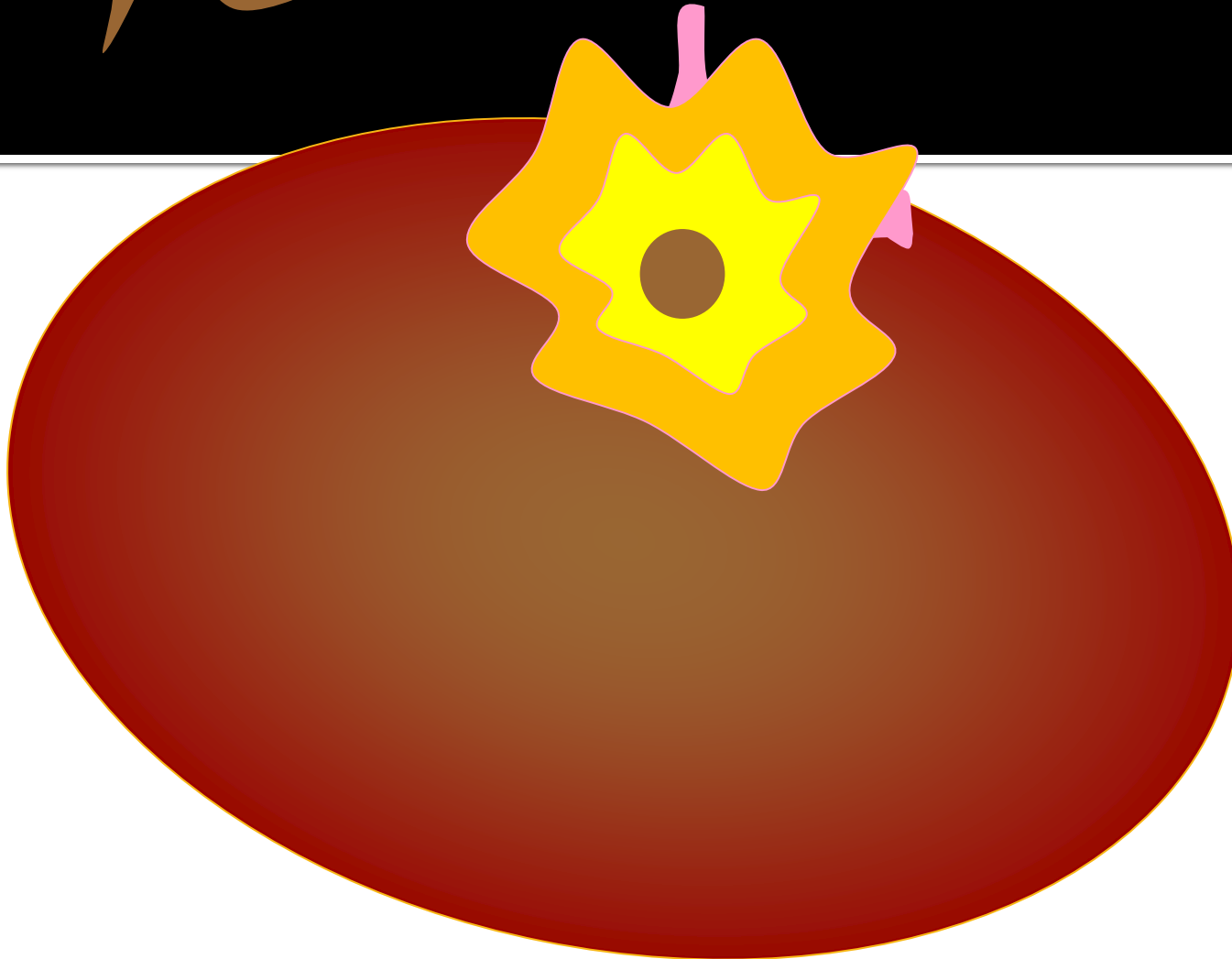
- Female gamete (reproductive cell)
- Haploid - half the number of normal chromosomes
- Present prior to birth, but maturation occurs at puberty
- Multiple eggs develop during a cycle, but only one matures

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# OVARIAN CHANGES





*This is an animation – to watch the animation, use a computer or laptop.*

# How they change during estrus

- Vulva: swollen due to estrogen, covered in mucus
- Vagina: excess mucus production
- Cervix: dilates to allow acceptance of semen (otherwise locked shut with hardened mucus to prevent infection)
- Oviducts: open to allow ovulation, fertilization
- Ovaries: ovulation – release of the follicle (egg and some supporting cells) from the ovary
  - number of young that a female can produce at one time is determined by how many eggs are released during ovulation
  - ovulation usually occurs at the end of a heat/estrus

~ MAKE SURE YOU KNOW THIS!

# Anatomical Disorders

- Closed Cervix – cervix does not open to allow fert.
- Retained Placenta – afterbirth stays in cow
- Damaged Oviduct (due to excess palpation)
- Freemartins – heifer exposed to male hormones
- Cystic ovaries – growth/swelling of ovaries
- Infection – varies
- Anovulation – lack of ovulation
- Metritis – inflammation of lining of the uterus

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