

Unit B

Understanding Animal Body Systems

Lesson 6

Anatomy and Physiology of Animal Reproduction Systems

Terms

- Alimentary canal
- Bladder
- Cervix
- Clitoris
- Cloaca
- Copulation
- Cowper's gland
- Epididymis
- Fallopian tubes
- Follicles
- Funnel

Gamete
Gestation
Infundibulum
Isthmus
Labia majora
Labia minora
Magnum
Mucosal cells
Ova
Ovary
Oviducts

Terms Continued

- Papilla
- Parturition
- Penis
- Prostate gland
- Retractor muscle
- Scrotum
- Semen
- Seminal vesicles
- Sheath
- Sigmoid flexure
- Sperm
- Spermatozoa
- Testicles
- Testosterone
- Urethra
- Urine
- Uterine horns
- Uterus
- Vagina
- Vas deferens
- Vulva
- Zygote

What are the major reproductive organs in male mammals?

What are the functions of those organs?

- I. To have a successful livestock operation, a producer must have an understanding of the functions of the various reproductive organs.
 - The male reproductive system contains several interconnected parts that must all work together in order to have successful mating. Some of the major organs found in the male mammal reproductive system are:

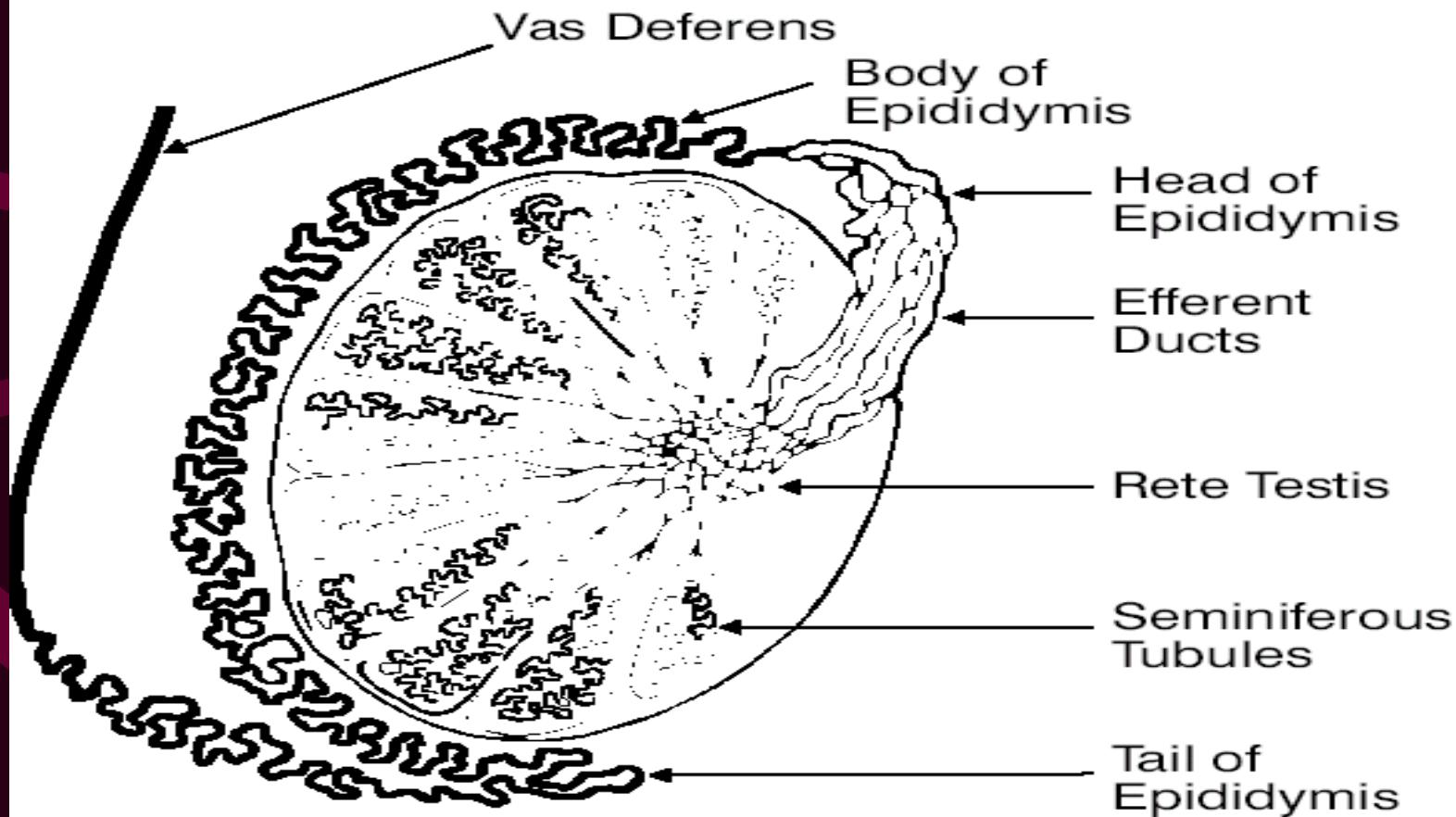
Male Reproduction

A. Testicles—The **testicles** produce **sperm**, the male sex cells also called **spermatozoa**. They also produce a hormone called **testosterone** that causes the appearance and behavior of the animal to be masculine. There are two testicles present in male mammals.

Male Reproduction

B. Epididymis—The ***epididymis*** is the storage site for sperm cells. These cells enter the epididymis from the testicle to mature. Sperm become able to fertilize a female's **ova** or female sex cell, as it travels through the epididymis. There is a separate epididymis attached to each testicle.

TESTES—PRIMARY REPRODUCTIVE ORGAN OF THE BULL

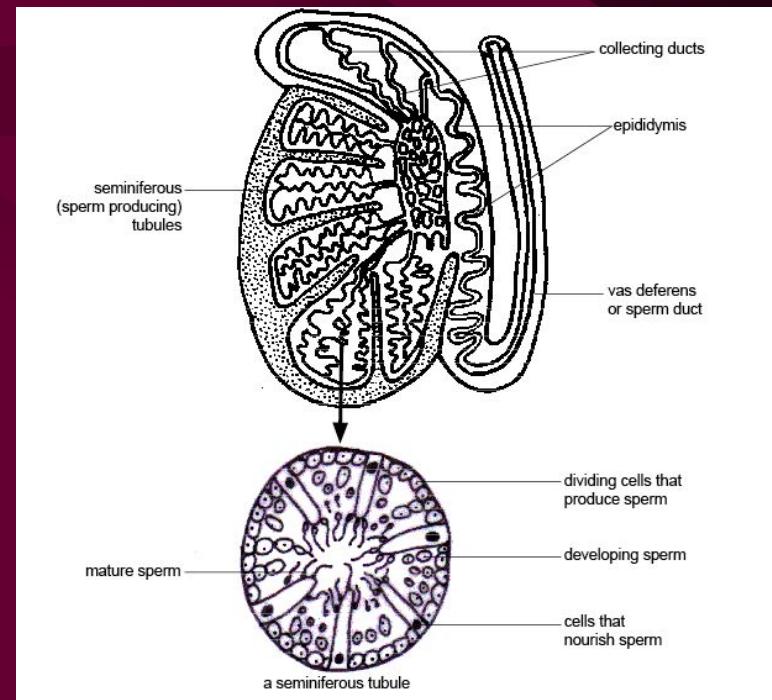


Male Reproduction

- C. Scrotum-the ***scrotum*** is a two-lobed sac that contains and protects the two testicles. It also regulates the temperature of the testicles, maintaining them at a temperature lower than body temperature.
- When the environment temperature is low, the scrotum contracts. When the environmental temperature is high, the scrotum relaxes
 - Maintaining the correct temperature is critical in that being too hot or too cold can affect the production and vitality of sperm.

Male Reproduction

D. Vas Deferens—The ***vas deferens*** is essentially a transportation tube that carries the sperm-containing fluid from each epididymis to the urethra.



Male Reproduction

E. Urethra—The *urethra* is a large, muscular canal extending from the urinary bladder. Both semen and urine move through the urethra to the end of the penis.

Male Reproduction

F. Accessory Sex Glands—There are several glands that add volume and nutrition to the sperm-rich fluid coming from the epididymis.

Male Reproduction

G. Seminal vesicles—The ***seminal vesicles*** open into the urethra. They produce a fluid that protects and transports the sperm.

H. Prostate gland—The ***prostate gland*** is near the urethra and the bladder. It produces a fluid that is mixed with the seminal fluid.

Male Reproduction

I. Cowper's gland—The *cowper's gland* produces a fluid that moves down the urethra ahead of the seminal fluid. This fluid cleans, neutralizes, and helps protect the sperm through the urethra. The mixture of the seminal and prostate fluid and the sperm is called **semen**.

Male Reproduction

J. Penis—The ***penis*** deposits the semen within the female reproductive system. The urethra in the penis is surrounded by spongy tissue that fills with blood when the male is sexually aroused. This causes an erection that is necessary for ***copulation***, or mating to occur.

- The ***sigmoid flexure*** (found in bulls, rams, and boars) and the ***retractor muscle*** extend the penis from the ***sheath***, a tubular fold of skin. Horses and other mammals do not have a sigmoid flexure. The blood that fills the spongy tissue when sexual arousal occurs causes erection.

Male Reproduction

General

organ	function
testis with seminiferous tubules	sperm production
collecting ducts	transport and storage
epididymis	transport, maturation and ejaculation
vas deferens (sperm duct)	transport and ejaculation
seminal vesicles	secrete thick liquid to transport sperm
prostate gland	secretes thin alkaline solution to neutralise urine and female system
cowper's gland	secretions may lubricate, flush out urine or form a gelatinous plug
urethra	passage for urine and sperm
penis	copulation

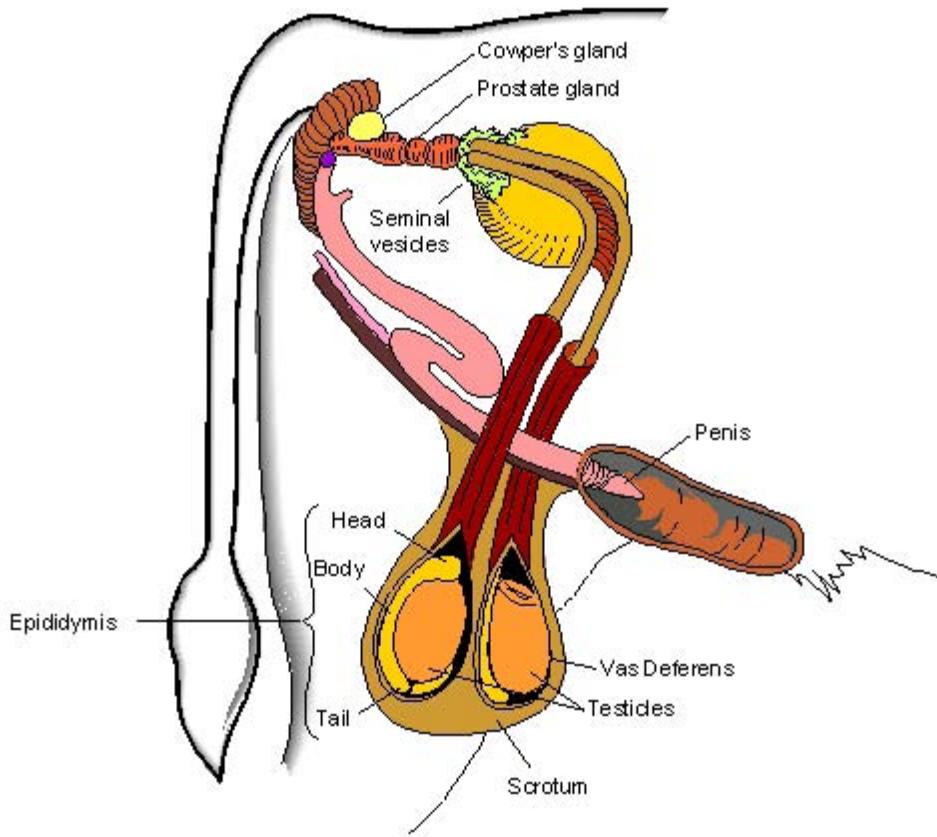
The diagram illustrates the male reproductive system with the following components and flow:

- Testis with seminiferous tubules:** Located at the top left, shown as a cross-section of coiled tubes.
- Collecting ducts:** Small tubes leading from the testis.
- Epididymis:** A long, coiled tube where sperm mature and are stored.
- Vas deferens (sperm duct):** A tube that transports sperm from the epididymis to the prostate gland.
- Seminal vesicles:** Two sac-like glands that secrete a thick, nutrient-rich fluid into the vas deferens.
- Prostate gland:** A gland that secretes a thin, alkaline fluid into the urethra to neutralize the acidic environment of the female tract.
- Cowper's gland:** A small gland located near the prostate that secretes a clear fluid into the urethra to lubricate it and flush out any residual urine.
- Urethra:** The central tube that carries both urine and sperm from the bladder to the outside through the penis.
- Penis:** The external organ used for copulation, containing the urethra.
- Urine:** Labeled near the bladder, indicating the path of urine.

Male Reproduction

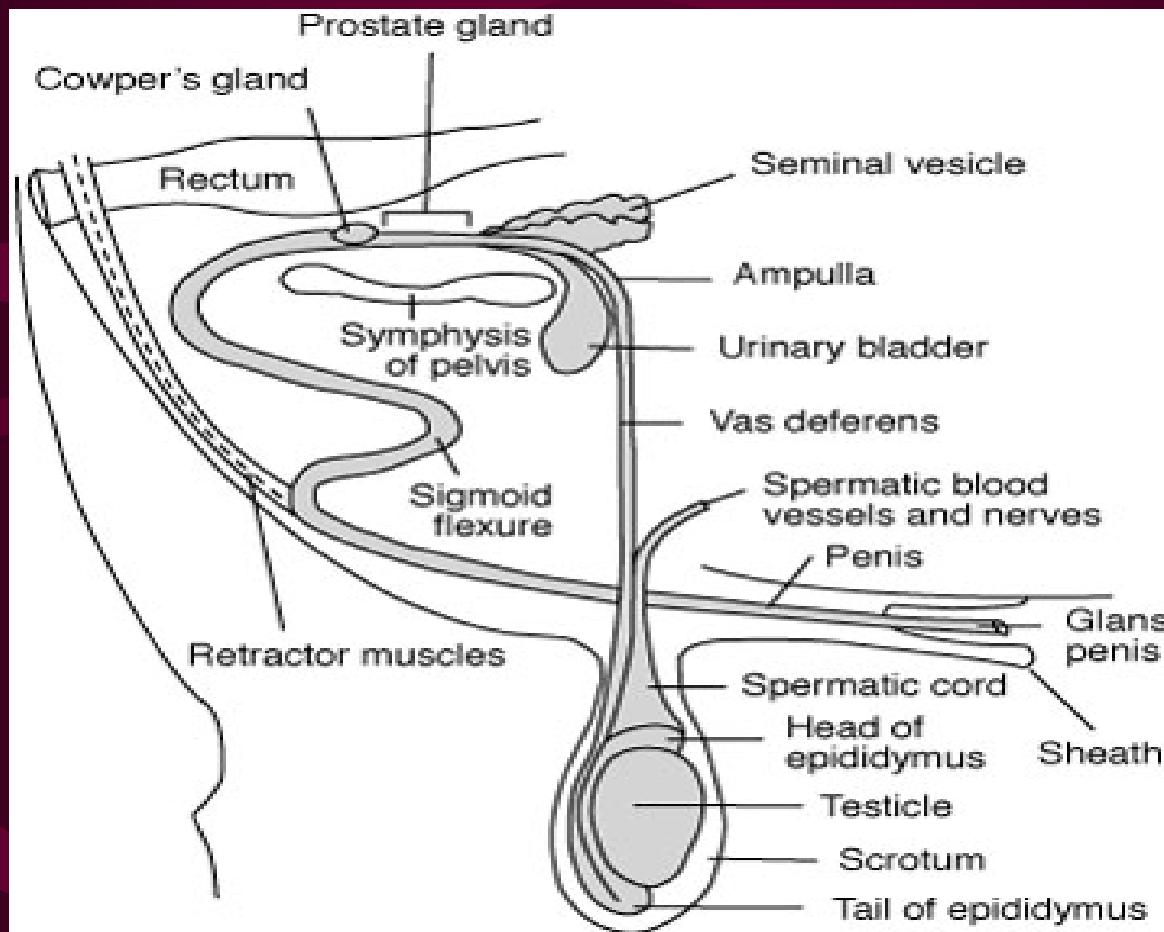
Bull

REPRODUCTIVE ORGANS OF THE BULL



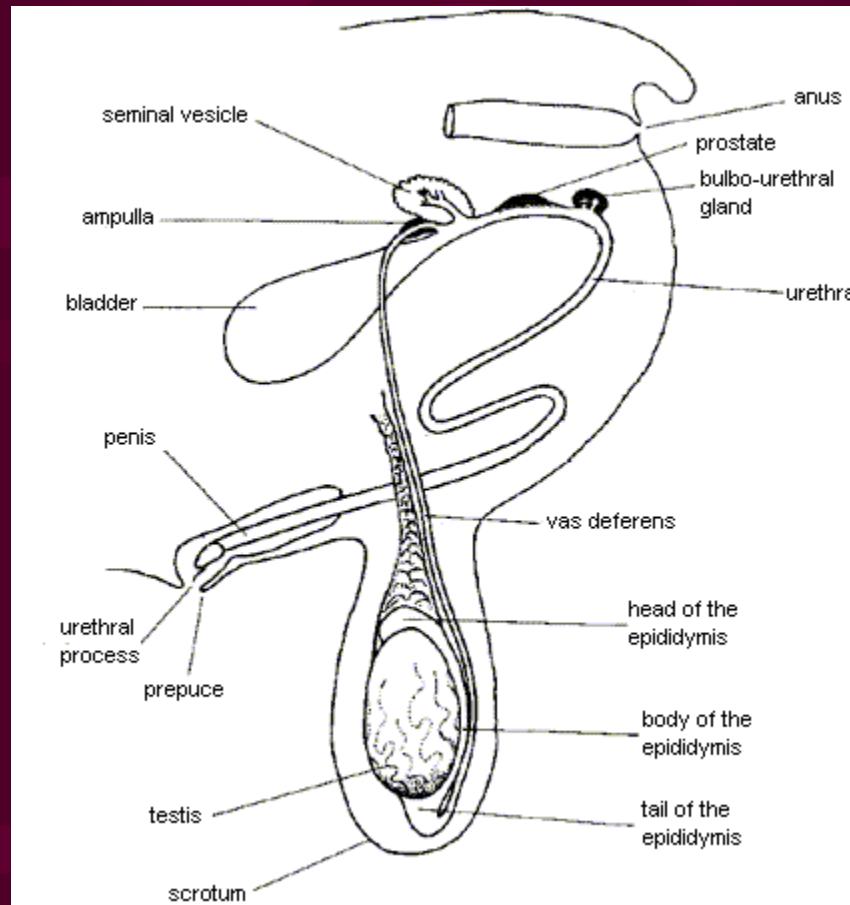
Male Reproduction

Bull



Male Reproduction

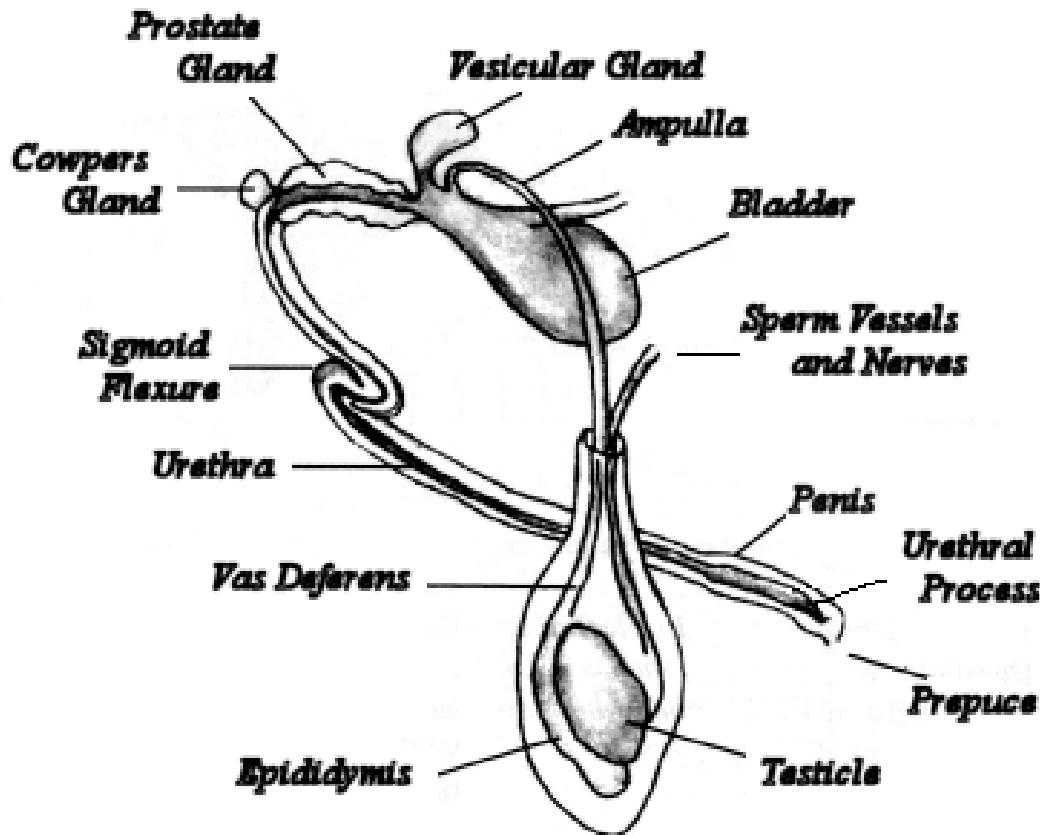
Ram



Male Reproduction

Buck

Reproductive System of the Buck



What are the major reproductive organs and functions in female mammals?

- II. Like males, female mammals have a complex system of organs that make up the reproductive system.
- Some of the major organs that make up the female reproductive tract are:

Female Reproduction

A. Ovary—The **ovary** produces female gametes.

- A **gamete** is a sex cell that can unite with other sex cells. These are called **ova** or eggs. A female mammal will typically have two ovaries. The ovaries also produce the female sex hormones estrogen & progesterone.
- Within each ovary there are hundreds of tiny **follicles** or cavities. The ova are produced in the follicles, the largest single cell in the body.

Female Reproduction

B. Oviducts—The ***oviducts or fallopian tubes*** are two tubes that carry the ova from the ovaries to the uterus. The oviducts are close, but not attached to the ovaries.

- The funnel-shaped end of each oviduct that is close to the ovary is called the ***infundibulum***. At ovulation the follicle ruptures, releasing an ovum that is caught by the infundibulum.
- After copulation, sperm move through the uterus to the oviduct. Fertilization of the ovum occurs in the upper end of the oviduct. The ***zygote***, or fertilized egg cell, moves to the uterus about 2 to 4 days after fertilization.

Female Reproduction

C. Uterus—The **uterus** of mammals is a Y-shaped structure consisting of the body, two uterine horns, and the cervix. The size and shape of the uterus varies among the various species. The upper part of the uterus consists of the two **uterine horns** that develop into the oviducts or Fallopian tubes. In most species pregnancy normally occurs in the uterine horns. In horses, pregnancy normally occurs in the body of the uterus. In all species, the fetus grows within the uterus, where it remains until **parturition** or birth.

- The **cervix** is the lower outlet of the uterus. It is composed primarily of connective tissue that constitutes the gateway between the uterus and the vagina.
- Like the rest of the reproductive tract, the cervix is lined with **mucosal cells**. These cells make significant changes as the animal goes from one estrous cycle to another and during **gestation** or pregnancy.

Female Reproduction

D. Vagina—The **vagina** serves as the female organ of copulation at mating and as the birth canal at parturition. It is the passage between the cervix and the vulva. The lining is moist during estrus and dry when the animal is not in estrus

Female Reproduction

E. Bladder—The *bladder* collects the liquid waste, which is called *urine*. The urine passes through the urethra to the vagina.

Female Reproduction

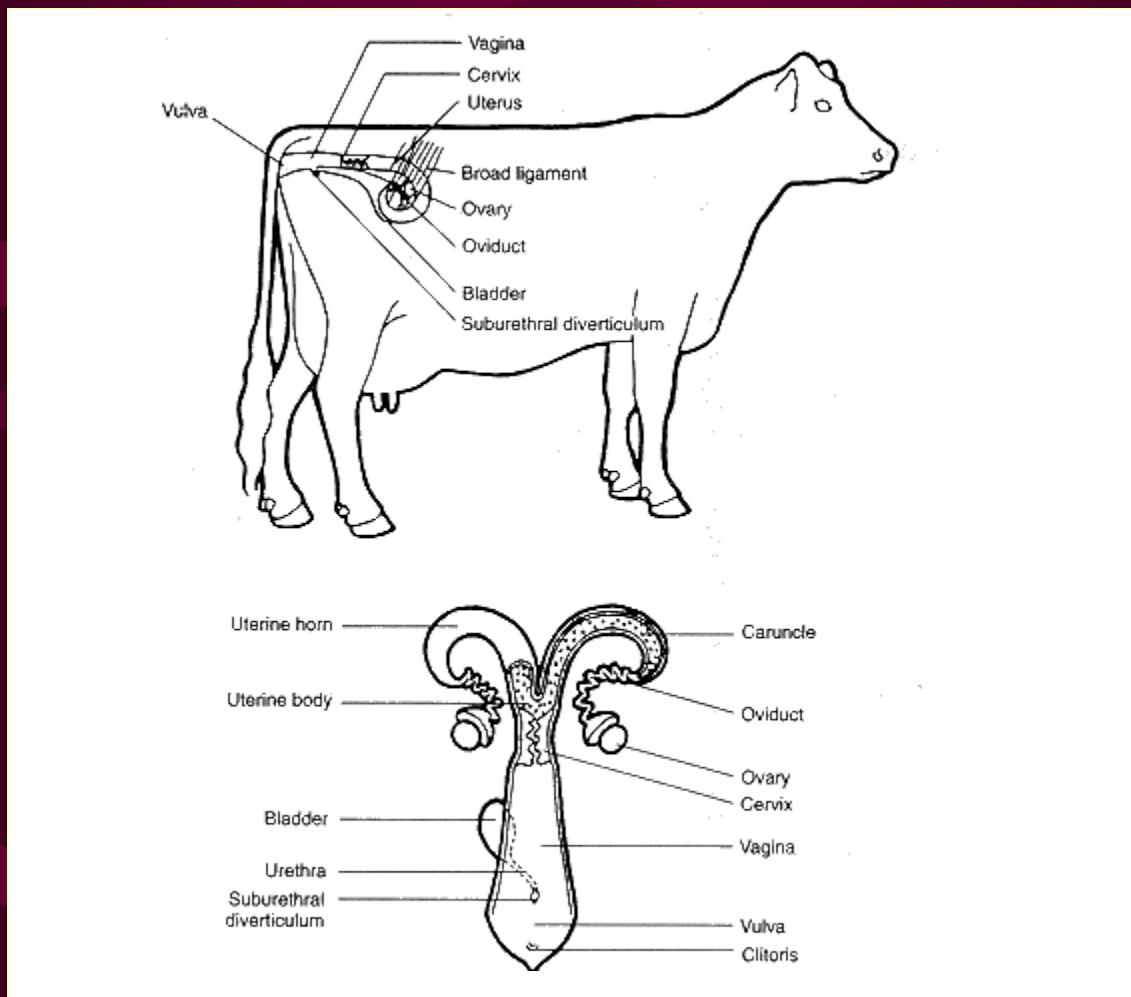
F. Vulva—The **vulva** is the external opening of the reproductive and urinary systems. The exterior, and visible part of the vulva, consists of two folds called the **labia majora**. The **labia minora** are two folds located just inside the **labia majora**.

Female Reproduction

G. Clitoris—The ***clitoris*** is the sensory and erectile organ of the female. It is located just inside the vulva.

Female Reproduction

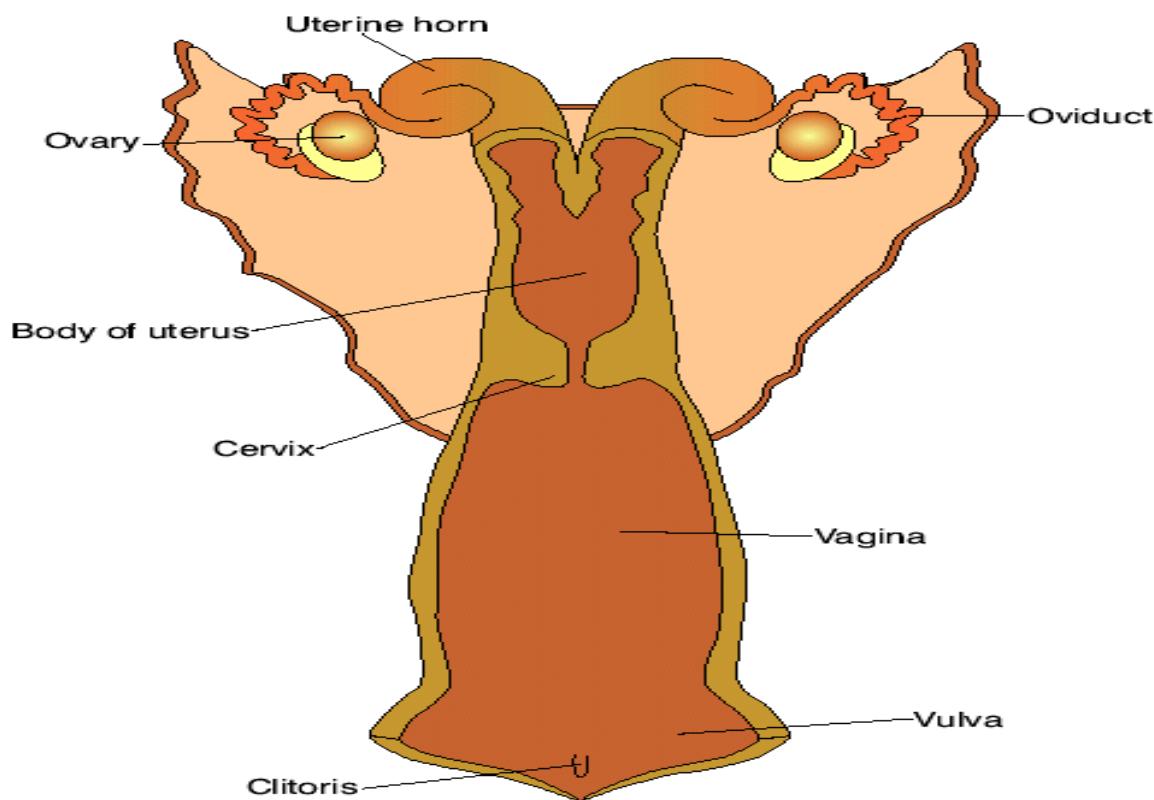
Cow



Female Reproduction

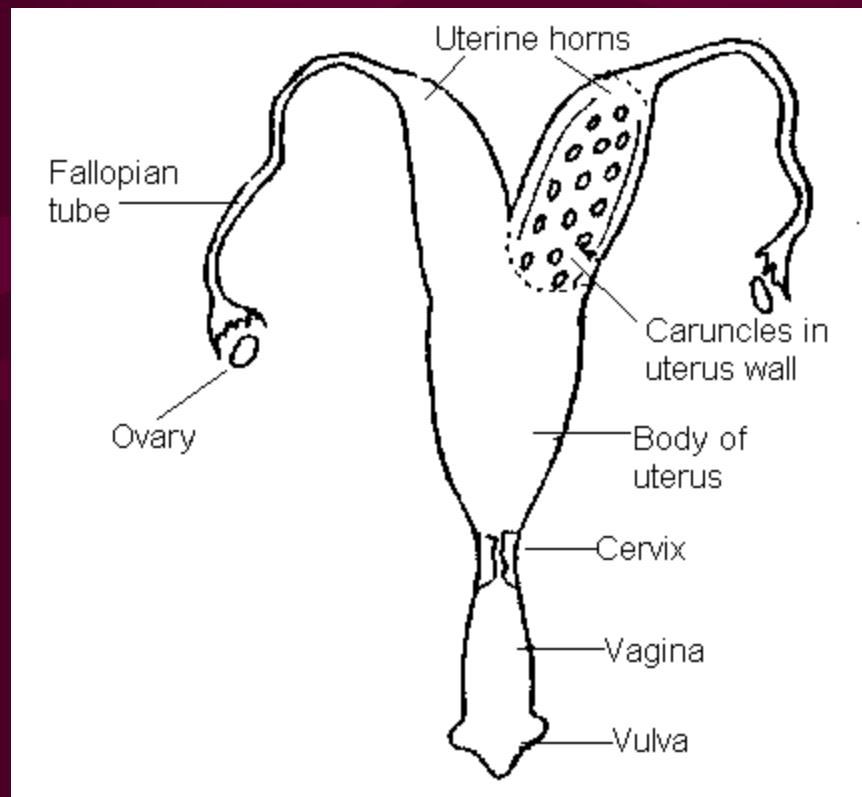
Cow

DORSAL VIEW OF THE REPRODUCTIVE SYSTEM OF A FEMALE COW



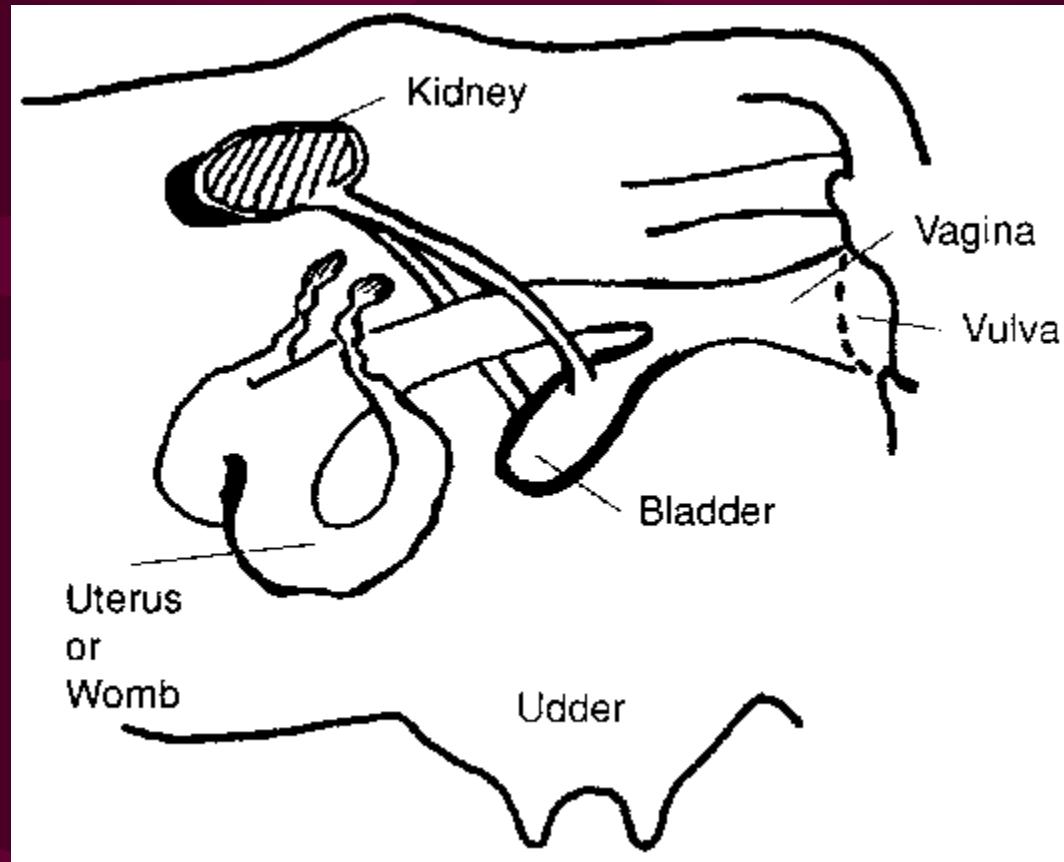
Female Reproduction

Ewe



Female Reproduction

Doe



What the major male and female reproductive organs in poultry and their functions?

III. The reproductive systems of poultry are similar to that found in mammals with a few differences.

A. The reproductive system of the male poultry includes the testicles, which are held within the body cavity rather than in a scrotum. The testicles produce the sperm and seminal fluid.

Poultry Reproduction

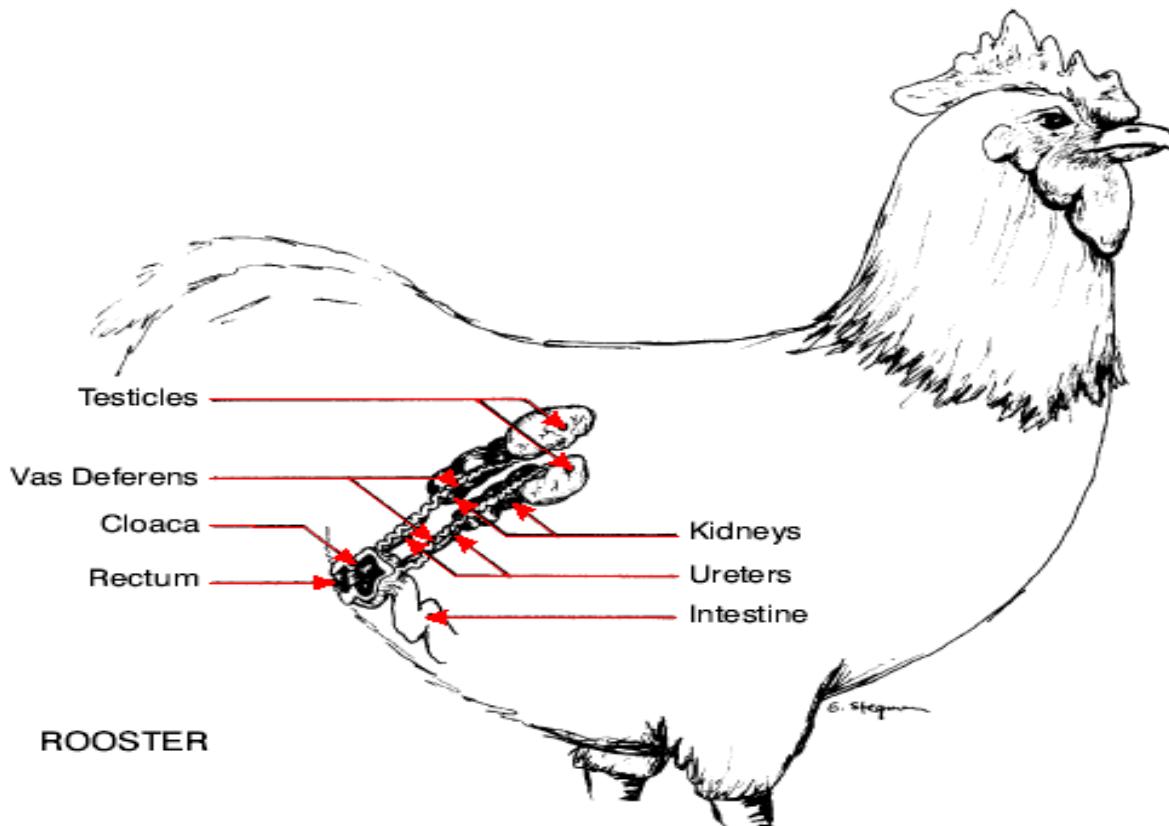
Male

- 1. The vas deferens carries the seminal fluid and sperm cells to the cloaca.
- 2. The **cloaca** is the enlarged part where the large intestine joins the end of the alimentary canal.
- 3. The **alimentary canal** is the food-carrying passage that begins at the mouth and ends at the vent.
- 4. The **papilla** is the organ in the wall of the cloaca that puts the sperm cells into the hen's reproductive tract.

Poultry Reproduction

Male

REPRODUCTIVE ORGANS OF A MALE CHICKEN



Poultry Reproduction

Female

B. The reproductive system of female poultry has two ovaries and two oviducts. The right ovary and oviduct do not function. Only the left ovary and oviduct produce eggs. The ova produced in the ovary develop into egg yolks. The oviduct of the chicken has five parts:

Poultry Reproduction

Female

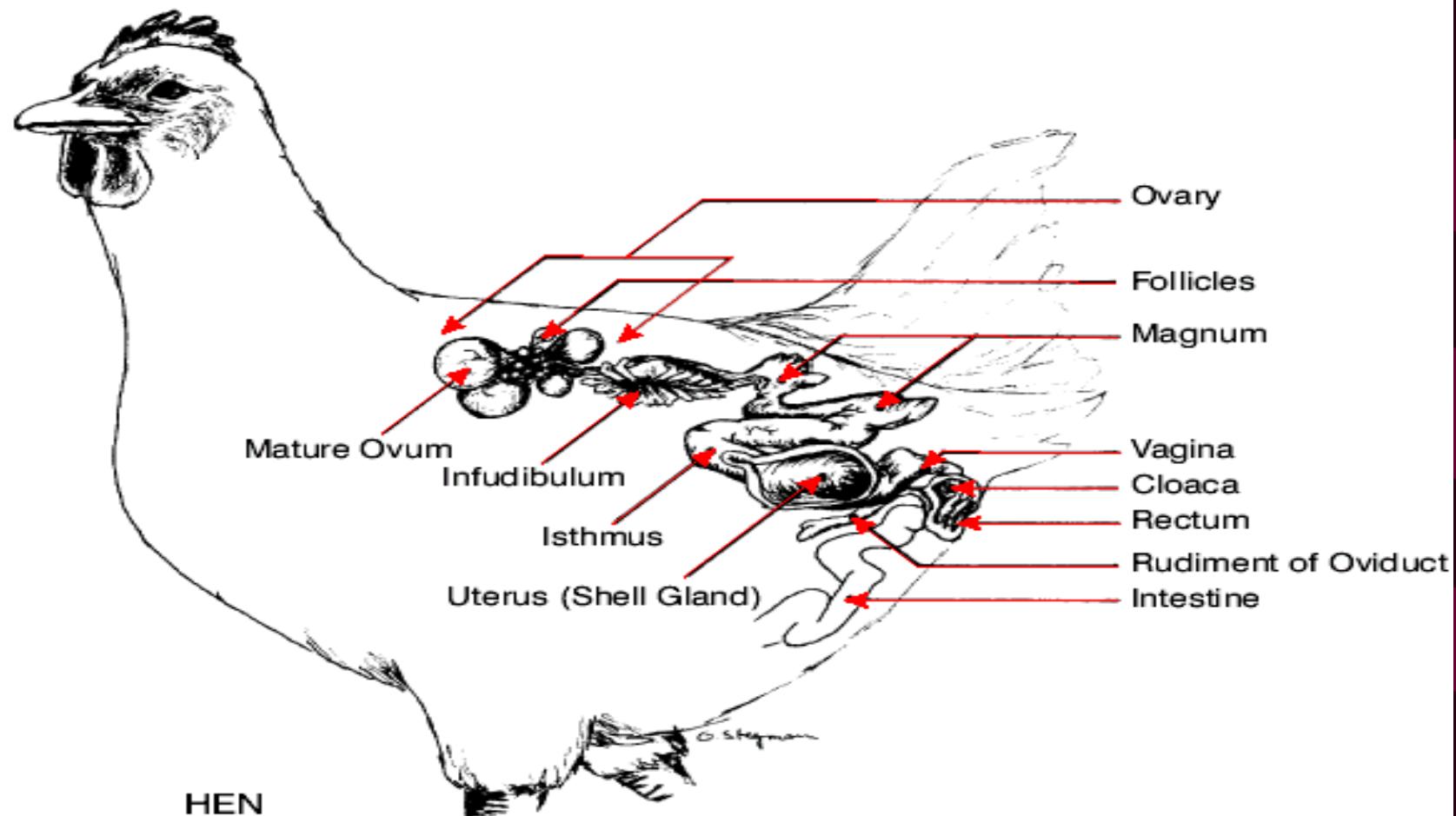
- 1. **Funnel**—receives the yolk from the ovary. The sperm cells that the chicken receives from the male are stored here.
- 2. **Magnum**—secretes the thick white of the egg. It takes approximately three hours for the thick white to be placed around the yolk in the magnum.
- 3. **Isthmus**—The yolk and thick white move from the magnum into the ***isthmus***, where two shell membranes are placed around the yolk and thick white. This process takes approximately $1\frac{1}{4}$ hours.

Poultry Reproduction

Female

- 4. **Uterus**—In the uterus, the thin white and the outer shell are added to the egg. The egg remains in the uterus about 20 hours.
- 5. **Vagina**—From the uterus, the egg moves into the vagina. The egg stays here only a short time after which it is laid. It takes about 25 to 27 hours for a chicken to produce one egg

REPRODUCTIVE ORGANS OF A FEMALE CHICKEN



Review/Summary

- What are two major reproductive organs in a male mammal & their functions?
- What are two major reproductive organs in a female mammal & their functions?
- What are the main differences between the reproductive organs in chickens and other mammals?