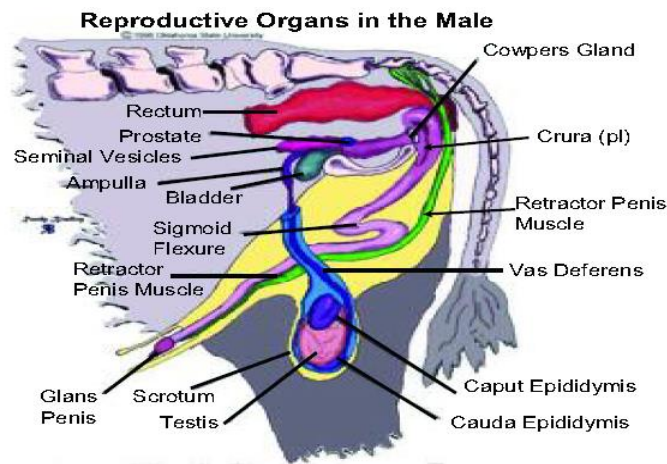


**Male anatomy (Male Genital Organs):**

The male reproductive or genital organs consist:

- 1- Primary sex organs (2 Testicles).
- 2- Secondary sex organs (Epididymis , Vas deferens, Spermatic cord)
- 3- Copulatory organ (Penis).
- 4- Accessory glands (2 Seminal vesicles, 2 Cowper's glands, 1 Prostate gland).
- 5- Urethra.
- 6- Prepuce.



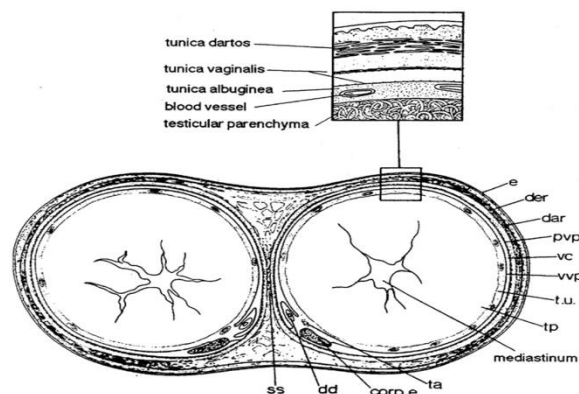
**Scrotum**

The scrotum consist:

- 1- skin with numerous large sweat and sebaceous glands.
- 2- Tunica dartos.
- 3- Scrotal fascia.
- 4- Tunica vaginalis.
- 5- External cremaster muscle.

Function of scrotum:

- 1- Protection of testis from traumas.
- 2- Regulation Temperature of testis.



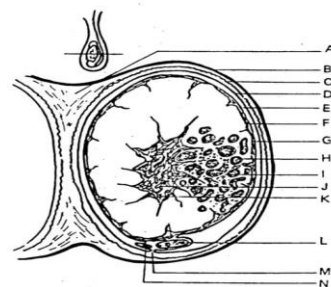
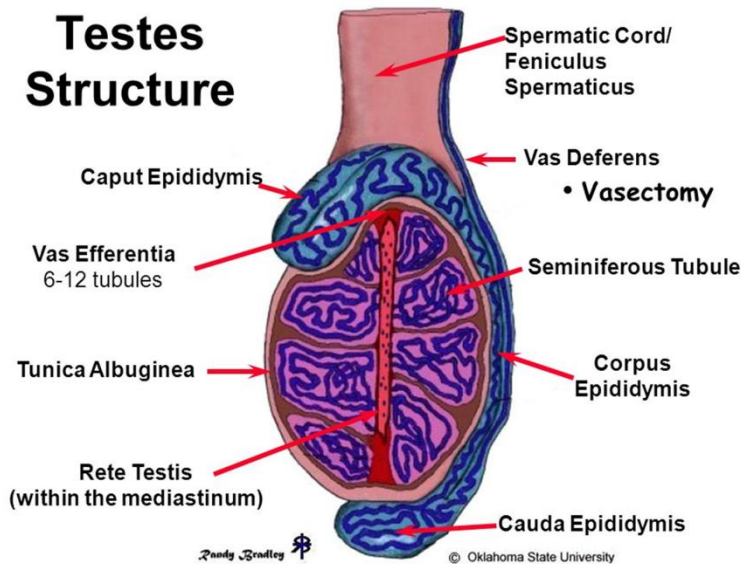
**The Testicle**

The testicle consist:

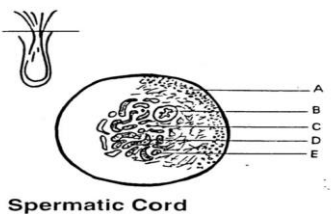
- 1- Tunica Albuginea
- 2- Seminiferouse Tubules
- 3- Rete Testis
- 4- Efferent Ducts
- 5- Leydig Cells
- 6- Sertoli Cells

Function of testet:

- 1- Production Sperm.
- 2- Production Male Hormones.



- A. Septum
- B. Skin
- C. Dartos
- D. Tunica vaginalis (parietal)
- E. Cavity
- F. Tunica vaginalis (visceral)
- G. Tunica albuginea
- H. Semiferous tubles
- I. Interstitial cells
- J. Rete testis
- K. Mediastinum
- L. Epididymis
- M. Peritoneal fold
- N. Vas deferens



- A. Cremaster muscle
- B. Vas deferens
- C. Nerve
- D. Pampiniform plexus
- E. Lymphatic

The testicle is covered by a white fibrous capsule called **tunica albuginea**. The albuginea consists of collagen fibers and a few elastic fibers. The lobules contain the seminiferous tubules. Seminiferous tubules are formed from primary sex cords. They contain germ cells (spermatogonia) and (Sertoli cells). Sertoli cells are larger and less numerous than spermatogonia. With stimulation by FSH, Sertoli cells **produce** both androgen binding protein and **inhibin**. Leydig (interstitial) cells are found in the parenchyma of the testes between the seminiferous tubules. LH stimulates Leydig cells to **produce** testosterone and small quantities of other androgens. The peripheral segment of the seminiferous tubules is convoluted; the tubules end as straight seminiferous tubules, which interconnect with each other inside of the mediastinum testis in a network of ducts **called** rete testis. The rete testis continues as ductuli efferentes, which are coiled.

### **The Epididymis**

The epididymis is the first excretory organ of the male genital system. The epididymis is attached to the testicle and consists of the ductuli efferentes and the ductus epididymidis, surrounded by the testicular albuginea. **The epididymis has a head, a body, and a tail.**

### **Function of epididymis**

- 1- **Transport Of Sperm** :
- 2- **Concentration Of Sperm** :
- 3- **Storage Of Sperm** :
- 4- **Maturation Of Sperm**

### **The Ductus Deferens**

The ductus deferens which serves as a transportation tube that carries the sperm-containing fluid from each epididymis to the urethra.

### **The Spermatic Cord**

The spermatic cord consists of the following structures:

- 1- Artery & Vein
- 2- Cremaster muscle
- 3- Nerve
- 4- Vas deference

### **Function of Spermatic Cord:**

- 1- Blood supply
- 2- Regulation Temperature of testis

### **Temperature Control**

**The role of the scrotum and spermatic cord in temperature control** of the testes involved drawing the testes closer swing further away from the body as ambient temperature rises. Two smooth muscles are involved. The tunica dartos, the smooth muscle of the spermatic cord, are sensitive to temperature. During cold weather, contraction of these muscles causes the scrotum to pucker and the spermatic cords to shorten, drawing the testes closer to the body. During hot weather, these muscles relax, permitting the scrotum to stretch and the spermatic cord to lengthen. Thus, the testes swing down away from the body. These muscles do not respond to changes in temperature until near the age of puberty. They must be sensitized by testosterone to respond to changing ambient temperature.

Actual cooling of testes occurs by two mechanisms. The skin of the scrotum has both sweat and sebaceous glands which are more active during hot weather. Evaporation of the secretions of these glands cools the scrotum and thus the testes. The external scrotum has been observed to be 2 to 5°C cooler than the temperature inside the testes. As the scrotum stretches during hot weather, more surface area is provided for cooling by evaporation. In addition to cooling occurs through heat exchange in the circulatory system. As arteries transporting blood at internal body temperature transcend the spermatic cord, their convoluted folds pass through a network of veins, the pampiniform venous plexus, transporting cooler blood back towards the heart. Some cooling of arterial blood then occurs before it reaches the testes. The lengthening of the cord during hot weather provides more surface area for this heat exchange.

### **The Accessory male Genital Glands**

The male accessory sex glands produce the bulk of the ejaculate, or semen, the medium for transport of sperm. Semen provides favorable conditions for nutrition of sperm and acts as a buffer against the natural acidity of the female genital tract. The accessory sex glands include the ampulla of the ductus deferens, vesicular gland, prostate gland, and bulbourethral gland. Except for the prostate, these glands are paired.

#### **Ampulla**

The ampulla are glandular enlargements associated with the terminal parts of the ductus deferens. They are well developed in the stallion, bull, and ram and absent in the boar. Glands of the ampulla empty into the ductus deferens and contribute volume to the semen.

#### **Vesicular Glands**

The vesicular glands (formerly called seminal vesicles) are paired glands associated with the genital fold. In most domestic species, each vesicular gland merges with the ipsilateral ductus deferens, creating the short ejaculatory duct, which empties into the pelvic urethra. In the boar, the vesicular glands open into the urethra separately from

the ductus deferens. The vesicular glands of the stallion are hollow, pear-shaped sacs; those of the bull, ram, and boar are lobulated glands of considerable size.

### **Prostate Gland**

The prostate gland is an unpaired gland that more or less surrounds the pelvic urethra. In farm animals the prostate gland comprises various combinations of diffuse and compact parts extending along the pelvic urethra under cover of the urethral muscle. The multiple ducts of the prostate gland open in two parallel rows, one on each side of the lumen of the urethra. The prostate produces an alkaline secretion that gives semen its characteristic odor. In older intact male animals, the prostate may become enlarged and interfere with urination.

### **Bulbourethral Glands**

The bulbourethral (formerly Cowper's) glands are paired glands on either side of the pelvic urethra just cranial to the ischial arch but caudal to the other accessory glands. Bulbourethral glands are especially large in the boar.

### **The Penis**

The male organ of copulation, the penis, may be divided into three general areas: **the glans**, or **free extremity**; the **main portion**, or **body**; and the **two crura**, or **roots**, that attach to the ischial arch of the pelvis. The bulk of the penile body's internal structure is composed of paired columns of erectile tissue, the corpora cavernosa. Each corpus cavernosum is replete with blood sinusoids divided by sheets of connective tissue called **trabeculae**. These are derived from the tunica albuginea, a heavy, fibroelastic capsule surrounding the penis. In species with a fibroelastic penis (ruminants and swine), the trabeculae form the bulk of the penis, and as a consequence, in these species the penis is firm when not erect.

**The stallion has a musculocavernous penis**, with the blood sinusoids predominating over connective tissue. The equine penis therefore is flaccid when not erect. The two crura of the penis are the proximal parts of the corpora cavernosa. They originate on the caudal surface of the ischial arch, one on each side of the symphysis of the pelvis. The ventral midline groove between the corpora cavernosa contains the penile urethra and an associated unpaired body of erectile tissue, the corpus spongiosum. The proximal continuation of the corpus spongiosum is the bulb of the penis, which lies between the crura. In most animals, the corpus spongiosum penis is continuous distally with the erectile tissue of the glans. The glans penis shows considerable variation from species to species. The horse and sheep both have a free portion of the urethra, the urethral process, that projects beyond the glans. The bull and ram have a helmet-shaped glans, and the external urethral opening of the bull opens into a twisted groove. The penis of the boar has a twisting cranial extremity and only a small glans. Erection of the penis occurs when more blood enters the penis by way of the arterial supply than leaves by the veins. The increased blood volume enlarges the penis and makes it turgid. In the stallion, whose penis is musculocavernous, the penis becomes

much larger in all dimensions upon erection. **The fibroelastic penis (as found in ruminants and swine)** does not increase much in diameter during erection. Instead, the chief effect of erection of the penis in these animals consists of lengthening the penis by straightening the sigmoid flexure.

- **Bull**



- **Ram**



- **Boar**



- **Stallion**



### Prepuce

The prepuce is an invaginated fold of skin surrounding the free extremity of the penis. The outer surface is fairly typical skin, while the inner mucous membrane consists of a preputial layer lining the prepuce and a penile layer covering the surface of the free extremity of the penis. The prepuce of the horse makes a double fold, so two concentric layers surround the penis when it is retracted. The prepuce of the pig has a diverticulum dorsal to the preputial orifice. It accumulates urine, secretions, and dead cells, which contribute to the typical odor of a mature boar.