Chapter 12

Genitourinary System

The Urinary System

Kidneys

Filter the blood and remove waste products of metabolism

Located on both sides of the vertebral column

The speed at which the blood filters through the kidneys depends on the blood pressure.

Structure

External cortex

The renal sinus contains the renal pelvis, blood vessels, and fat

The renal pelvis is a funnel shaped reservoir that occupies most of the renal sinus

Internal medulla

Medullary pyramids are cone shaped structures which make up the medulla.

The cortex extends between the renal pyramids and is called the renal columns.

Nephron

the Functional Unit of the Kidney

Functional unit of the kidney consists of the renal corpuscle and renal tubule

There are about 1 Million nephrons in the kidney.

The Ureters

Carry the urine from the kidneys

There is one from each kidney

Urine enters the bladder an average of every 10 to 30 seconds in spurts.

The spurts are produced by the peristaltic waves.

The Urinary Bladder

Extremely elastic musculomembranous sac.

There are two opening for urine to enter and one exit for the urethra.

A sphincter muscle, controls the flow of the urine into the urethra.

The bladder has two functions it stores and excretes urine.

Micturition- voiding of urine from the bladder

The Urethra

Membranous tubular canal that carries urine from the bladder to the exterior of the body.

In the female the only function of the urethra is urination.

In males it has a dual function carrying both urine and reproductive secretions.

Characteristics of Normal Urine

Most urine is clear, pale amber in color.

Urine is approximately 95% water

Contains dissolved substances such as nitrogenous wastes, electrolytes, toxins, pigments, hormones, and sometimes glucose or blood.

It also can depend on temperature, water intake, and type of work the animal is doing.

Male Reproductive Organs

The Testes

Egg-shaped glands normally located in the scrotum.

Their size, shape, and location vary between species.

Two functions: producing spermatozoa (sperm cells) and secreting hormones.

Makes testosterone.

Testosterone maintains the male secondary characteristics such as the massive head and shoulders on bulls and the tusks on boars.

Male animals have less subcutaneous fat which make their meat less tender and juicy. Castration (removal of the testicles) is performed on all male animals that are intended for meat production after sexual maturity is reached.

Epididymis

A pair of tightly coiled tube like structures that act as a place for sperm to mature, store sperm before ejaculation, and secrete small portion of the seminal fluid.

Vas Deferens

A pair of muscular tubules that extend from the epididymis.
They travel to the bladder and connect with the seminal vesicle duct to form the ejaculatory duct.

Ejaculatory Ducts

Two short tubes that are formed by the joining of the vas deferens and the seminal vesicle ducts.
They pass through the prostate gland and extend to the urethra.

Vesicular Glands (Seminal Vesicles)

Secrete the liquid part of the semen.

Prostate Gland

Composed of smooth muscles and glandular tissue.
Surrounds the pelvic urethra.
Produces an alkaline substance that makes up most of the seminal fluid.

Bulbourethral Glands

Two rounded glands located on either side of the urethra.

Produce seminal fluid similar to the prostate secretion.

Spermatic Glands

Formed of white, fibrous tissue, encasing the vas deferens, blood and lymph vessels, and nerves.

Scrotum

A pendulous, saclike, skin covered structure that houses the testicles.

Penis

Made up of three rounded masses of cavernous tissue encased in heavy fibrous capsule.

Female Reproductive Organs

Ovaries

Two almond shaped glands located caudal to the kidneys and on each side of the uterus.

That size of the ovaries varies with species.

Structure

Single layer of epithelial cells.

Network of connective tissue in which a countless number of follicles containing ova (female sex cells) are located.

Functions

Ovulation and Hormone Secretion

The ova develop in the ovaries.

Produces Estrogen and progesterone

Estrogen induces the development of secondary sex characteristics and cyclic changes that prepare the uterus for implantation.

Oviducts or Uterine (Fallopian) Tubes

The proximal end is attached to the uterine horn, but the ovarian end is funnel shaped with fingerlike processes which are suspended adjacent to the ovaries.

The oviducts act as ducts for the ova produced in the ovaries to enter the uterus.

Fertilization usually occurs in the oviduct.

Uterus

Thick, walled, hollow organ lying in the pelvic cavity.

Uterine walls are formed with three layers.

Endomettrium- inner lining

Myometrium- middle layer, formed with layers of smooth muscles extending diagonally, crosswise, and lengthwise.

Perimetrium- is part of the peritoneum covering the uterus.

During estrus it prepares for possible acceptance of a developing fetus.

Maintains and supports the fetus.

When in labor, the uterus (myometrium) contracts to move the fetus into the birth canal.

Cervix

Continuous between the uterus and the vagina.

Composed of smooth muscle arranged in a ring like fashion called a sphincter muscle.

Prevents foreign bodies from entering the uterus during gestation as protection for the fetus.

Vagina

Extends from the cervix of the uterus to the external genitalia.

Extremely elastic tube of smooth muscle lined with a mucous membrane.

Passage out of the body for uterine secretions and acts as the birth canal.

Vulva

External genitalia

Mammary Glands

Milk producing glandular structures located along the entire ventral surface of litter bearing animals.

Mammary gland development is controlled by estrogen and progesterone.

Structure

Composed of connective and adipose tissue in lobes and lobules.

Function

Produce milk for the neonate.

Milk is production is stimulated by the hormone prolactin produced in the pituitary gland.

The Estrous Cycle

Puberty varies between and within species.

The onset of the estrus cycle begins at puberty and normally continues for the rest of the animal's life.

The female reproductive system under goes cyclic changes at regular intervals.

Controlled by hormones from both the ovaries and the pituitary glands.

Purpose is to prepare the uterus to receive a fertilized ovum.

The length of the cycle varies from species to species.

Stages of Estrous Cycle

Proestrus

Follicle- stimulating hormones (FSH) is secreted by the pituitary gland and causes the follicles in the ovary to develop.

Estrus

In heat

Metestrus

Estrogen levels decrease and progesterone is responsible for proper implantation.

Diestrus and Anestrus

Anestrus is a phase of sexual inactivity that occurs between cycles.

Pregnancy

Period of time between conception and parturition

Fertilization usually occurs in the uterine tube.

The fertilized ovum moves to the uterus where is develops a placenta and implants to the endometrial lining.

Until implantation the developing organism is called an embryo.

After implantation the developing organisms is called a fetus.

The placenta is the only connection between the female and developing fetus.