

Male Reproductive System

In order for a species to thrive, it must be able to reproduce itself. Producing offspring requires the proper functioning of both the male and female reproductive systems, each of which consists of several parts that have specific purposes in the reproductive system. Hormones also play an important role in reproduction. For example, in the male reproductive system, the parts and hormones work together to produce sperm and transfer it to the female.

Parts of the Reproductive System

The male animal possesses special reproductive organs. These organs are similar in all male mammals, although some differences in form and function do exist. The bull can be used to illustrate the male mammalian reproductive system.

Bull – A bull is a male bovine. Its reproductive system contains a number of different parts (Figure 1.1). A bull has two testicles, which are located in the scrotum beneath the animal. An epididymis is located in the scrotum next to each testicle. The epididymis is connected to the urethra by the vas deferens. The seminal vesicles, prostate gland, and Cowper's gland (also called the bulbourethral gland) are located next to the bladder where the vas deferens

meets the urethra. The urethra extends from this point to the penis. The sigmoid flexure is located midway along the urethra, which also has a retractor muscle attached to it. The sheath provides an opening for the penis.

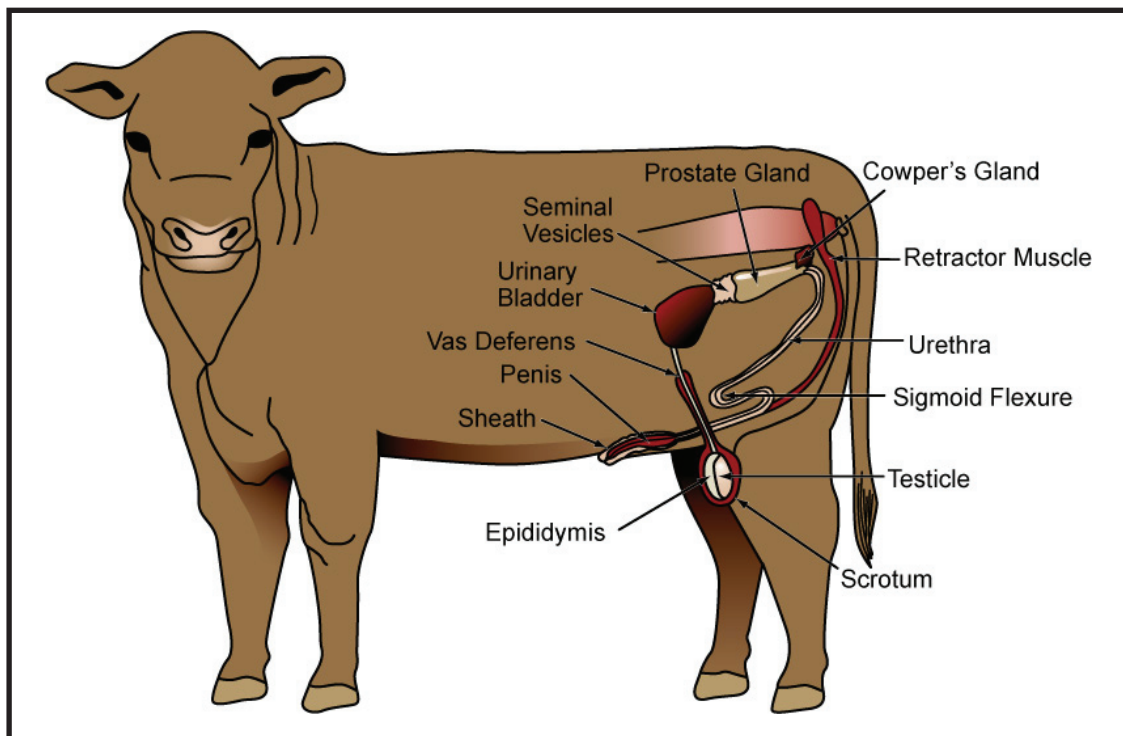
Boar – A boar is a male swine. The boar's reproductive parts are pictured in Figure 1.2. One difference between the boar and the bull is the positioning of the testicles and scrotum, which are located at the rear of the boar rather than at the bottom of the animal. The form of the penis, which is shaped like a corkscrew, also differs from the bull's.

Ram – A ram is a male sheep. The ram differs from the bull in that a filiform appendage extends from the head of the penis. In the ram, the sheath is also referred to as a prepuce.

Stallion – In horses, a male is called a stallion. In contrast to the bull, the stallion's scrotum is located further toward the rear of the animal and is less pendulous. The stallion also lacks a sigmoid flexure.

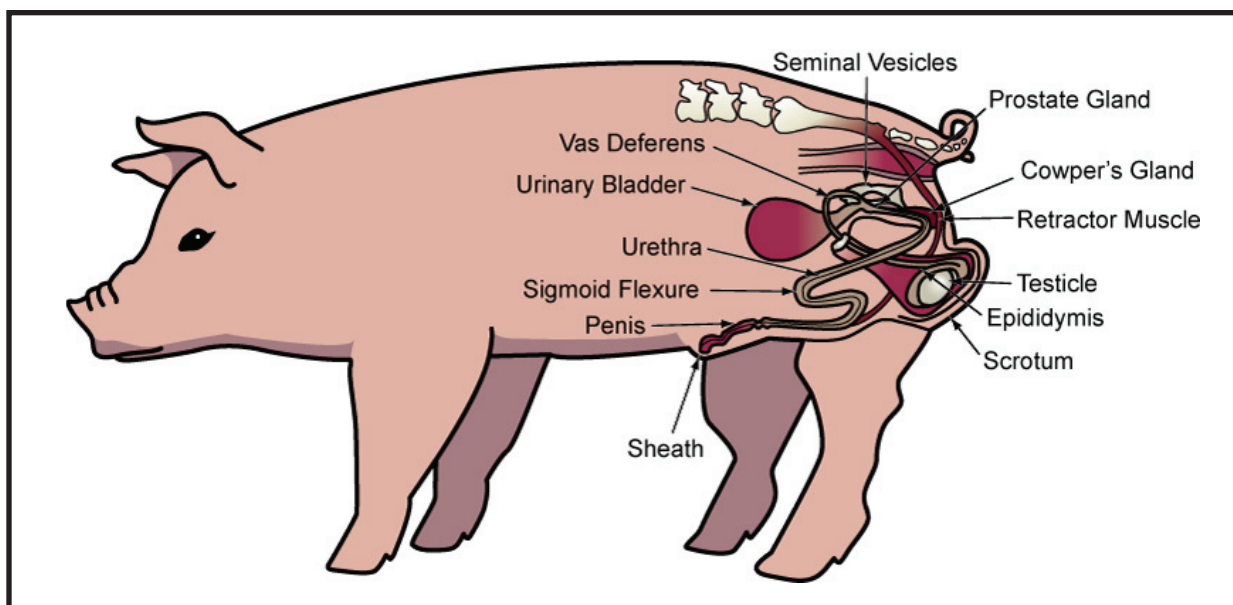
Dog – The Cowper's gland and seminal vesicles are absent in the male dog. The dog also does not have a sigmoid flexure. The sheath of the penis is referred to as a prepuce.

Figure 1.1 - Reproductive System of the Bull



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Figure 1.2 - Reproductive System of the Boar



Buck – The male rabbit is called a buck. Differences between the rabbit's reproductive system and the bull's include the name of the scrotum, which is referred to as the inguinal pouch, and that of the sheath, or prepuce. In the buck, the prostate gland is separated into three parts, and the Cowper's gland is absent. The buck also does not have a sigmoid flexure.

Fowl – Fowl include chickens, turkeys, and other birds. Unlike other animal species covered in this lesson, fowl are not mammals. Thus, they have a very different reproductive system from the others, as illustrated in Figure 1.3. Fowl do not have a scrotum. Instead, their testicles are located within the abdomen, next to the backbone. The vas deferens connects the testicles to the cloaca, papillae, and vent. The papillae are small, finger-like projections within the cloaca. Fowl do not have a urethra or urinary bladder.

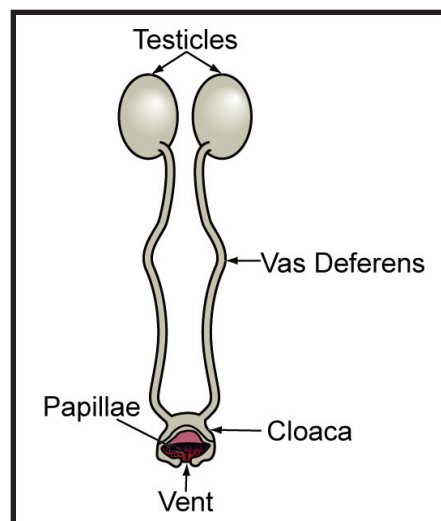
Functions of the Parts

Each part has a specific function in the reproductive system. If any of the parts do not function correctly, the animal may have difficulty with reproduction or be unable to reproduce. Following is a description of the functions of each of the reproductive parts of the bull.

Testicles – The testicles are the primary reproductive part. They produce hormones associated with reproduction as well as the male gametes, or sex cells, called sperm. The testicles are made up of seminiferous tubules, which are tiny coiled tubes that produce the sperm, as well as interstitial cells located between the tubules that secrete reproductive hormones.

Scrotum – The scrotum is a sac or pouch of skin that carries the testicles and regulates their temperature. When cold, the testicles are drawn close to the body for warmth. In hot weather, the testicles hang away from the body.

Figure 1.3 - Reproductive System of a Rooster



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Epididymis – The epididymis is a tube with three parts: a head, body, and tail. Sperm is stored in the epididymis for maturation. It also concentrates the sperm and transports it from the testicles to the vas deferens.

Vas deferens – The vas deferens is a tube that transports sperm from the epididymis to the urethra.

Urethra – The urethra carries sperm and urine to the penis.

Urinary bladder – The bladder stores urine before it is released to the urethra. It has no reproductive function.

Seminal vesicles – The seminal vesicles produce the seminal fluid that transports and protects the sperm.

Prostate gland – The prostate gland releases fluid that mixes with the seminal fluid and nourishes the sperm. The combination of the sperm with the fluids from the seminal vesicles and prostate gland is referred to as semen.

Cowper's (bulbourethral) gland – This gland releases a fluid into the urethra that cleanses and neutralizes it to allow the sperm to survive the passage to the penis. The secretions pass through the urethra prior to the semen.

Sigmoid flexure – This S-curved muscle extends the penis outside the body during mating.

Retractor muscle – This muscle pulls the penis back into the body.

Penis – The penis is an organ that deposits semen into the female reproductive tract. It also excretes urine from the body.

Sheath – The sheath is a fold of skin that covers and protects the penis when it is relaxed.

The reproductive parts found in the boar, stallion, dog, and buck have functions similar to those of the bull. The filiform appendage found in the ram is actually the opening of the urethra, which extends beyond the head of the penis. It rotates and sprays semen during mating.

The reproductive system of the fowl, however, differs in form and function from the other domestic animals covered in this lesson.

Testicles – As in the other animals, sperm and hormones are produced in the testicles. In fowl, they also secrete the seminal fluid.

Vas deferens – Sperm and seminal fluid are transferred from the testicles to the cloaca through the vas deferens.

Cloaca – The reproductive and digestive systems meet at the cloaca. The male cloaca joins the female cloaca in the mating process.

Papillae – Attached to the inside wall of the cloaca, the papillae transport the sperm to the female reproductive tract during mating.

Vent – The vent is connected to the cloaca. It releases the reproductive and digestive products.

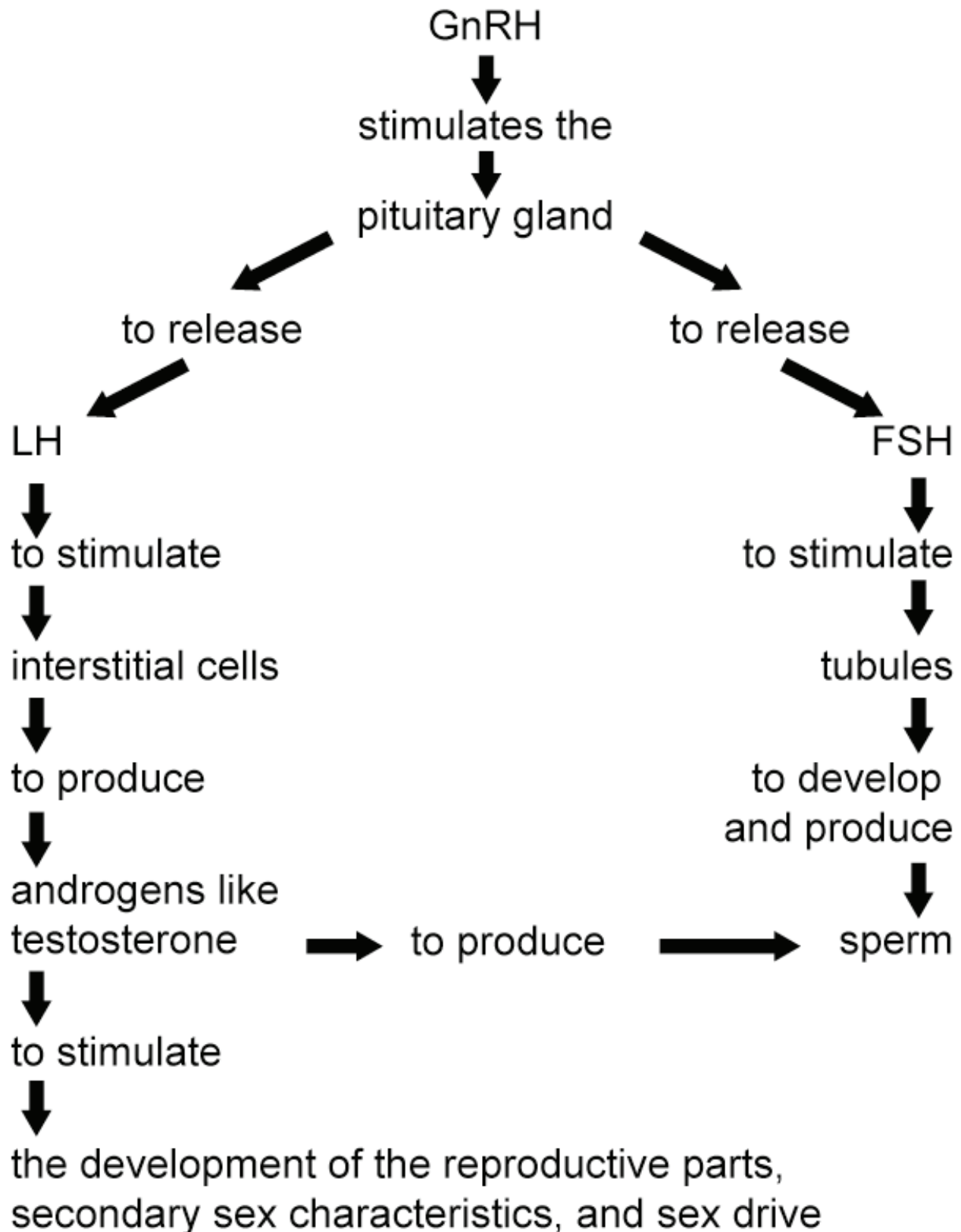
Hormones

A hormone is a chemical substance secreted by an organ of the body. When released into the bloodstream, it triggers a specific response in another organ. Reproductive hormones affect the activity of the parts of the reproductive system.

Gonadotrophin releasing hormone (GnRH) is a reproductive hormone produced by the hypothalamus gland, which is found in the brain; GnRH is not present in fowl. The anterior lobe of the pituitary gland secretes follicle stimulating hormone (FSH) as well as luteinizing hormone (LH). LH is also sometimes referred to as interstitial cell stimulating hormone (ICSH). The sex hormones that control male reproductive development and behavior are collectively called androgens. The androgen testosterone is produced in the testicles of all the species except rabbits, which produce another androgen.

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Figure 1.4 - Hormones of the Male Reproductive System in Mammals



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The Role of Hormones

Hormones play an important role in reproduction. A delicate balance exists among the various hormones. Figure 1.4 shows the connections between the different reproductive hormones and parts in mammals.

In mammals, GnRH stimulates the anterior pituitary gland in the brain to release both FSH and LH, which are essential to reproduction. In fowl, the release of FSH from the pituitary is stimulated by increased light. FSH affects the tubules in the testicles, causing them to produce sperm. LH causes the interstitial cells in the testicles to secrete androgens.

Androgens like testosterone stimulate the development, growth, and activity of reproductive parts. The production of androgens triggers a maturing stage called puberty, in which the reproductive parts mature as the ideal hormone level is reached. Testosterone and other androgens also trigger the development of male secondary sex characteristics. These characteristics may include a deep voice, heavy muscling, and aggressiveness; in fowl, sex characteristics may consist of plumage, a wattle and comb, and crowing. Sex drive, which is the desire and ability to mate, is similarly stimulated by androgens. They also function in the production of sperm.

Summary

Male animals have a reproductive system that includes specific parts and hormones. Each part has a function that is triggered by the hormones of the male reproductive system.

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