

# Avian Reproductive System—Male

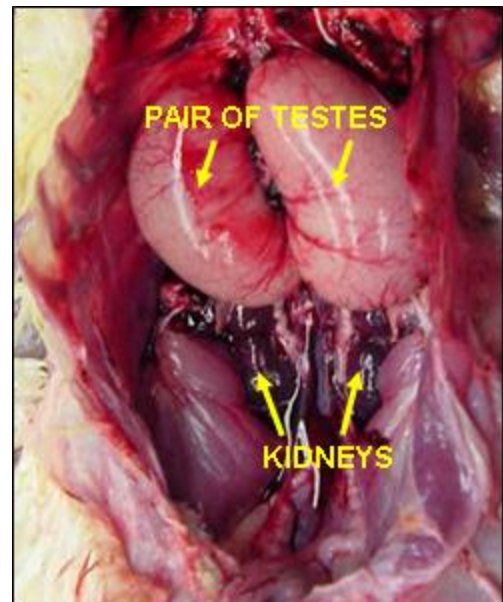
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An understanding of the male avian reproductive system is useful for anyone who breeds chickens or other poultry.

One remarkable aspect of the male avian reproductive system is that the sperm remain viable at body temperature. Consequently, the avian male reproductive tract is entirely inside the body, as shown in Figure 1. In this way, the reproductive system of male birds differs from that of male mammals. The reproductive tract in male mammals is outside the body because mammalian sperm does not remain viable at body temperature.

Fig. 1. Location of the male reproductive system in a chicken. Source: Jacquie Jacob, University of Kentucky.



## Parts of the Male Chicken Reproductive System

In the male chicken, as with other birds, the **testes** produce sperm, and then the sperm travel through a **vas deferens** to the **cloaca**. Figure 2 shows the main components of the reproductive tract of a male chicken.

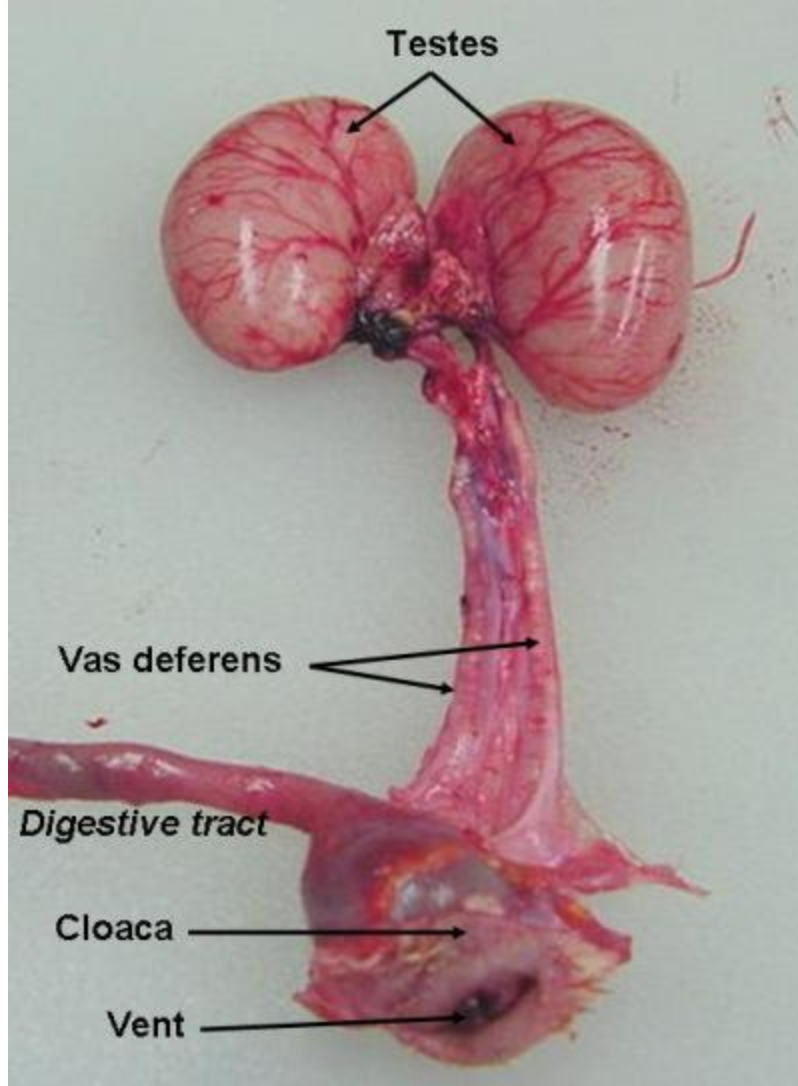


Fig. 2. Reproductive tract of a male chicken. Source: Jacquie Jacob, University of Kentucky.

The male chicken has two testes, located along the chicken's back, near the top of the kidneys. The testes are elliptical and light yellow.

Both gonads (testes) are developed in a male chicken, whereas a female chicken has only one mature gonad (ovary). Another difference between the sexes involves sperm production versus egg production. A rooster continues to produce new sperm while it is sexually mature. A female chicken, on the other hand, hatches with the total number of ova it will ever have; that is, no new ova are produced after a female chick hatches.

The vas deferens is the duct through which sperm are transported from the testes. The male chicken has two vasa deferentia (plural of *vas deferens*). The vas deferens is also the main area of sperm storage in male chickens. Applying external pressure in this area results in ejaculation, and the collection of sperm in this way for artificial insemination of hens often is referred to as milking the rooster.

Each vas deferens opens into a small bump, or papilla, on the back wall of the cloaca. The papillae (plural of *papilla*) serve as the mating organs. (The rudimentary copulatory organ located on the middle and front portion of the cloaca is inaccurately named because the chicken does not use it for copulation, or mating. It is used by breeders to classify the sex of baby chicks.)

## Fertility in Chickens

The main goal of a chicken breeder is to produce hatching eggs. The only hatching egg is a fertilized, or fertile, egg. **Flock fertility** is the percentage of eggs produced that are fertile. Flock fertility is a critical statistic in hatching egg production: the higher the percentage, the better. An egg that is not fertile contains no embryo; therefore, no chick will hatch. Simply put, hatchability—the percentage of eggs that hatch—can never be greater than flock fertility.

Flock fertility is dependent on the reproductive status of the chickens (that is, the level of egg and semen production) combined with the chickens' interest in and capability of mating. Fertility of both male and female chickens tends to decrease as the chickens get older. For females, it is believed that the decline in fertility is due to faster release of sperm from the sperm storage tubules within the chicken's reproductive system, meaning that the hen cannot store sperm as long and, therefore, requires more frequent mating. For males, it is presumed that although roosters continue to produce sperm for many years, sperm quality declines and mating activity decreases as a rooster ages. Also, an increase in early embryo deaths occurs when incubated eggs come from chickens in the second half of their reproduction cycle. These early deaths often appear as clears and may be mistaken for infertile eggs during candling or breaking out of unhatched eggs.

## Castration of Roosters

Roosters can be castrated. This castration, or removal of the testes, is referred to as **caponization**. Caponization must be done when a chick is small. While immature the gonads are small and easy to remove. Once the male has reached sexual maturity the gonads are large and too close to the kidneys to allow for their safe removal. When the testes are removed, the cockerel fails to develop certain male characteristics or tends to lose those characteristics if they have developed already.

Caponization produces a unique type of poultry meat (see Figure 3). The meat of a rooster tends to become coarse, stringy, and tough as the rooster ages. This decline in quality of meat does not occur in capons. Caponized males grow more slowly than intact male chickens and accumulate more body fat. Deposits of fat in both the light meat and dark meat of capons is greater than in the meat of intact males, resulting in a meat that is more tender and juicier. The older the age at which a capon is slaughtered, the more flavorful the meat is.

Fig. 3. Capons in a grocery store. Source: Jacquie Jacob, University of Kentucky

