

Female Reproductive System

The female animal, like the male, has a reproductive system that consists of several different organs, as well as hormones that trigger the development and functioning of the various parts. The parts and hormones work together for the successful reproduction of healthy offspring.

Parts of the Reproductive System

The reproductive system of the female is very different from that of the male of the same species. However, all female mammals have a similar system. The reproductive system of the cow can therefore be used as a general example.

Cow – A cow is a female bovine. Its reproductive system is pictured in Figure 2.1. Two ovaries are found toward the rear of the abdominal cavity. Located next to each ovary is an infundibulum, which is the funnel-shaped portion of the oviduct. The oviducts, also known as the fallopian tubes, lead from the ovary to the uterus. The uterus consists of two branches, called uterine horns, and a body. The uterus is connected to the vagina by the cervix, the inner surface of which consists of folds of tissue. The contents of the bladder are emptied into the base of the vagina by the urethra. The external parts of the female reproductive tract are the clitoris and the vulva.

Figure 2.1 - Reproductive Parts of a Cow

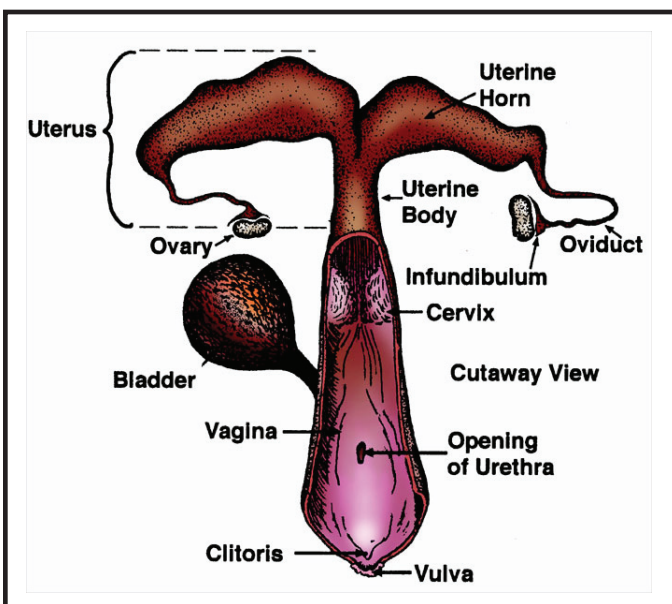
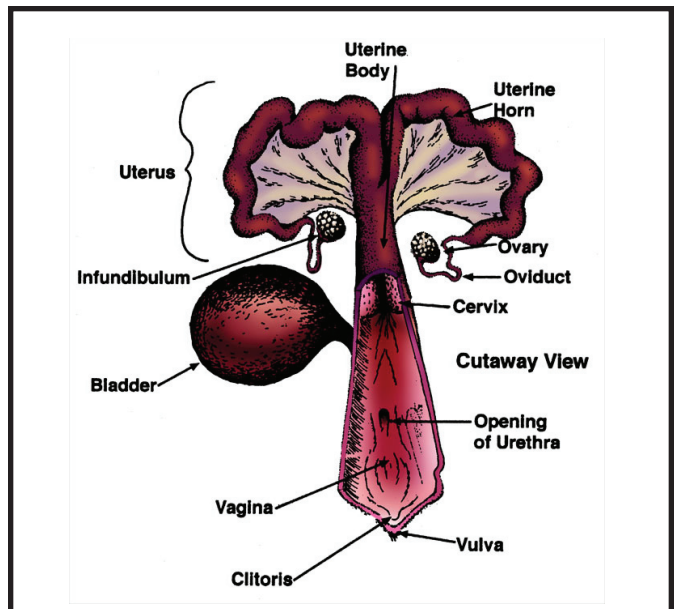


Figure 2.2 - Reproductive Parts of the Sow



Sow – A sow is a female swine. The sow's reproductive system (Figure 2.2) differs from the cow in that the uterine horns are more prominent in the sow. Also, the cervix is not folded but has protruding areas instead.

Ewe – The ewe is a female sheep. Its reproductive system is very much like the cow's.

Mare – In horses, the female is called a mare. The mare has a smoother cervix, without folds like the cow's.

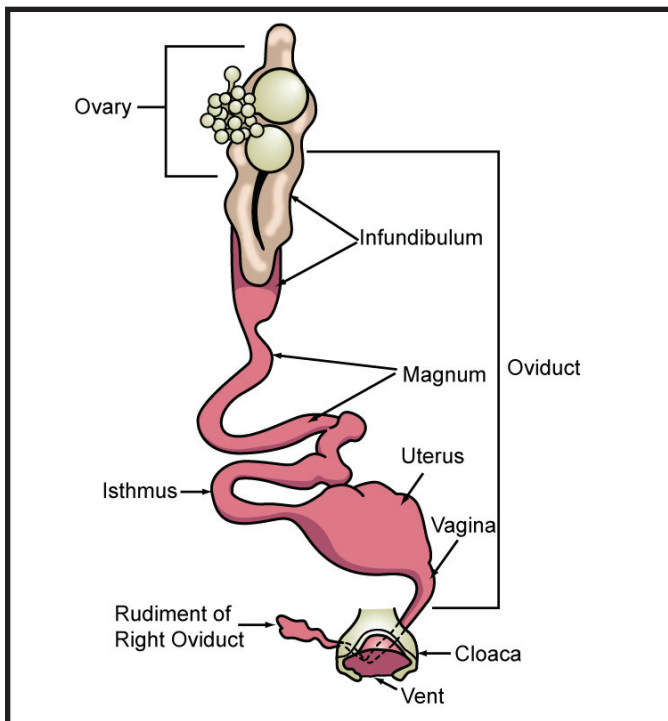
Bitch – In the female dog, or bitch, the uterine horns are more prominent, like those of the sow.

Doe – The female rabbit, called a doe, has prominent uterine horns, like the sow and bitch. In the doe, each uterine horn has a separate cervix connecting it to the vagina.

Fowl – The female reproductive system in fowl is quite different from that of the mammals. Figure 2.3 shows the reproductive organs of the chicken. Only the left ovary and oviduct of the hen are functional, although the right is found in an underdeveloped state. The oviduct has five parts—the infundibulum, magnum, isthmus, uterus, and the vagina. A cloaca and vent are located at the end of the oviduct.

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Figure 2.3 - Reproductive Parts of the Hen



Functions of the Parts

Each part of the female reproductive system has a very specific function. If one of the organs in the reproductive system does not function correctly, reproduction may be impaired. It may become difficult or impossible for the animal to produce healthy offspring.

Ovary – The ovaries produce the female sex cells, called eggs or ova, and sex hormones. The ova are released from follicles on the ovary.

Infundibulum – The infundibulum receives the egg from the ovary.

Oviduct – The oviduct, or fallopian tube, is a tube-like structure that carries the egg from the ovary to the uterus. It is also the site where sperm and egg meet during fertilization.

Uterus – The fertilized egg develops in the uterus before birth.

Uterine horns – The fertilized egg attaches to the uterine wall and begins to develop in the uterine horns. The sow, dog, and rabbit have more pronounced uterine horns because they are litter-bearing animals.

Cervix – The cervix is a muscular structure that functions as a passageway for the sperm and keeps bacteria and foreign material out of the uterus during pregnancy by forming a waxy mucus plug. During the birthing process, the cervix acts as a part of the birth canal.

Vagina – Semen is deposited into the reproductive system through the vagina. The vagina is a part of the birth canal as well as part of the route by which urine passes out of the body.

Urinary bladder – The bladder stores urine before it is released through the urethra.

Urethra – Urine is passed from the bladder to the vagina through the urethra. It empties into the base of the vagina. The urethra and bladder have no reproductive function.

Clitoris – The clitoris, which is located inside the vulva, is a highly sensitive part corresponding to the penis that is stimulated during mating.

Vulva – The vulva is the external opening of the urinary and reproductive systems.

The functions of the various parts of the reproductive system described above are the same for all these species except fowl. In fowl, the reproductive parts and their functions are significantly different.

Ovary – As in other animals discussed in this lesson, the hen's single ovary produces ova. The nucleus of the egg is attached to a yolk sac.

Oviduct – The oviduct is a long tube that transports the mature yolk from the ovary to the cloaca. It also carries semen to the infundibulum.

Infundibulum – The infundibulum receives the mature yolk from the ovary. It is also the site where the egg is fertilized by the semen, which is stored in the infundibulum in the folds of the oviduct.

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Magnum – The magnum secretes albumen, which is the white of the egg. It surrounds the yolk.

Isthmus – Two shell membranes are added to the egg yolk and white in the isthmus.

Uterus – Also known as the shell gland, the uterus adds a thin white, shell, and pigment to the egg.

Vagina – The egg is temporarily stored in the vagina before it is laid. It also produces the cuticle, the exterior coating of the shell.

Cloaca – The cloaca, which is the junction of the digestive and reproductive systems, receives the male's semen. The egg passes through the cloaca during laying.

Vent – The vent is the opening through which the egg passes out of the body during laying.

Hormones

Hormones are vital to reproduction. They cause the organs of the reproductive system to develop and prepare the body of the female for producing offspring.

Some of the hormones produced by females are also found in males. For example, as in the male, gonadotrophin releasing hormone (GnRH) is produced by the hypothalamus. Follicle stimulating hormone (FSH) and luteinizing hormone (LH) are also secreted from the anterior pituitary gland. Other hormones, however, are unique to the female, such as estrogen, which is secreted by the follicles in the ovary. Another hormone produced in the ovary is progesterone, which is secreted by the corpus luteum, a body that develops from a follicle that has released an ovum. The hormone prostaglandin is released by the uterus.

Fowl differ not only in the parts of the reproductive system but also in the number of hormones produced. Their bodies secrete only four major sex hormones. FSH and LH are released by the anterior pituitary gland, and estrogen and progesterone are secreted by the ovary. While these hormones are found in the other species, their functions differ in fowl.

The Role of Hormones

Hormones regulate and develop the reproductive system. The hormones must interact in a balanced manner to ensure the proper development and functioning of the reproductive system. Figure 2.4 graphically illustrates the female hormone cycle.

As it does in the male, GnRH stimulates the pituitary to release FSH and LH. In the female, FSH stimulates the follicles in the ovaries to develop a mature ovum. FSH also triggers the secretion of estrogen.

Estrogen causes the sex organs and secondary sex characteristics to develop and stimulates a desire to mate. Estrogen has an effect on other hormones as well; when estrogen is released, it suppresses the production of FSH and encourages the production of LH by the pituitary. Estrogen also causes uterine contractions that aid in transporting sperm to the oviduct to fertilize the egg.

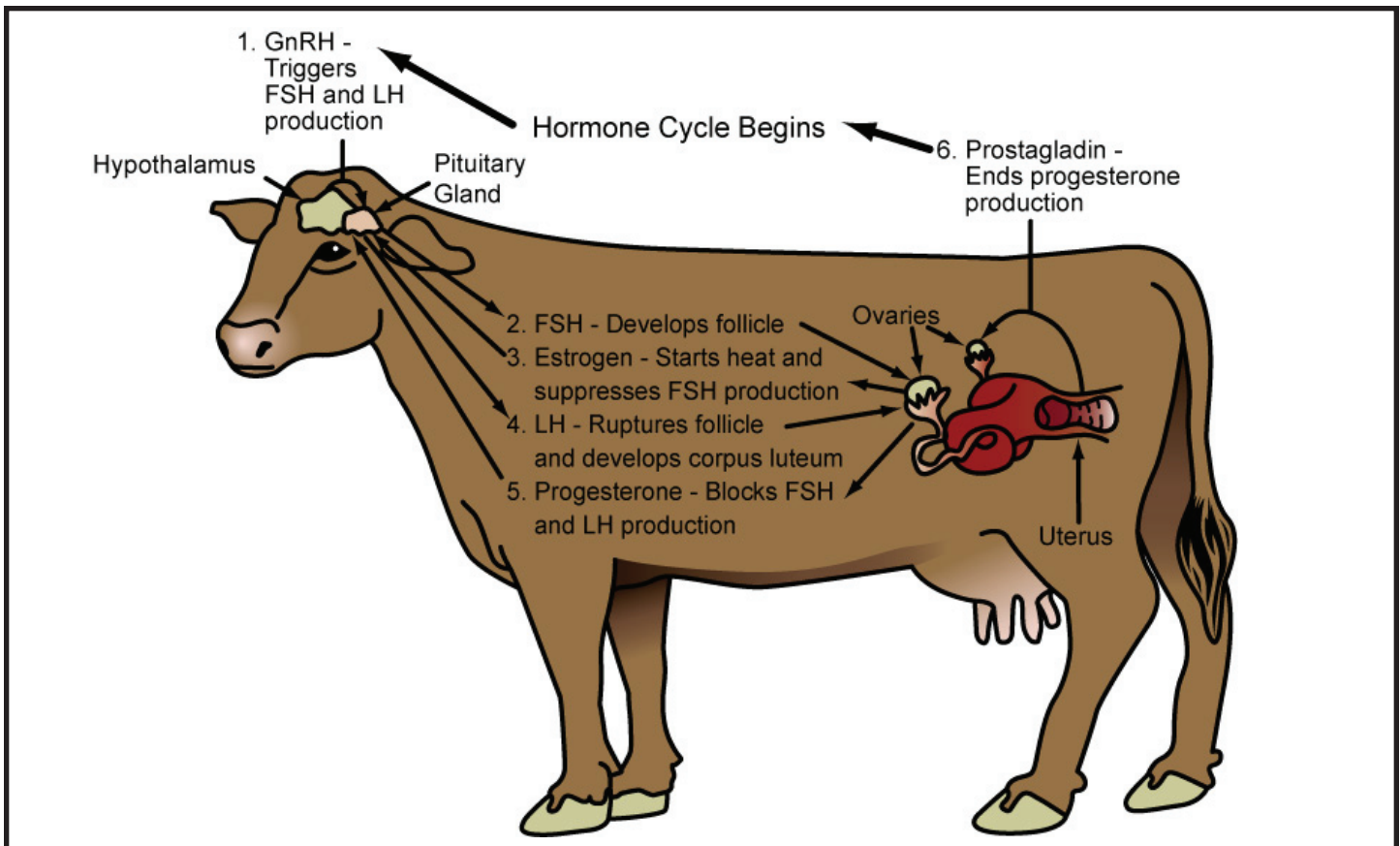
LH causes the follicle to release the egg, a process referred to as ovulation. In addition, this hormone develops the corpus luteum, also known as the yellow body, from the follicle after the egg is released.

The hormone progesterone, secreted by the corpus luteum, stops the production of FSH and LH. It thus prevents follicle development and the secretion of estrogen.

The hormones then play different roles depending on whether the egg is fertilized or not. If the egg is fertilized, the corpus luteum stays in place, and progesterone is produced to maintain the pregnancy by preventing uterine contractions and triggering the release of secretions to nourish the fertilized egg. Progesterone also blocks ovarian activity by inhibiting the secretion of GnRH. If the egg is not fertilized, the corpus luteum deteriorates due to the secretion of prostaglandin in the uterus, ending progesterone production. When progesterone levels are low, GnRH is released and the cycle starts again.

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Figure 2.4 - Female Hormone Cycle



In fowl, the hormones have different roles. FSH production is triggered by increased light; for example, lengthening spring days cause FSH to be produced in wild birds. FSH's main role is to develop yolks. It also stimulates the secretion of estrogen and progesterone. Estrogen increases blood calcium, protein, fats, vitamins, and other egg formation substances. The hormone also plays an important role in egg laying by prompting the separation of the pubic bones and the enlargement of the vent. Progesterone causes the hypothalamus to trigger LH production by the pituitary. When LH is added to the bloodstream, the follicle opens and releases the mature yolk into the infundibulum.

Summary

The various organs and hormones of the female reproductive system are important for producing healthy offspring. They work together to ensure successful reproduction.

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