

# Different Hormonal Effects on the Animal Reproductive System

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## ABSTRACT

Hormones play a crucial role in animal reproductive system structure, function and coordination. The production of estrogen and progesterone in females is controlled by follicle-stimulating and luteinizing hormones. Testosterone is essential for the growth and maintenance of a male's sexual characteristics sperm production and libido. In males, oxytocin regulates both sexual stimulation and ejaculatory flow. Improving reproductive health and fertility in animals requires understanding hormonal interactions and regulation. More research can be performed based on our understanding of these involved processes and their effects on animal reproduction.

### 1. Introduction

Hormones are chemical signals that are made by glands like the pituitary gland, ovaries, and testes. These hormones control how reproductive organs develop, grow, and stay healthy. They also control the production of gametes, sexual behavior, and pregnancy. Hormones are also very important to how animals' reproductive systems work and how they are controlled. Without proper hormonal control, the reproductive system won't work as well as it should, which can cause infertility, reproductive disorders, and problems with getting pregnant. Because of this, it is important to understand the different effects of hormones if you want to know how animals reproduce. The pituitary gland makes FSH, which is important for the growth of both female follicles and male sperm. When estrogen is present, FSH helps follicles grow and develop in females. FSH makes more sperm come out of male testicles. LH, produced by the pituitary gland, is important to the male and female reproductive systems. LH makes ovulation happen and helps the corpus luteum grow, which makes progesterone. In males, LH makes the Leydig cells in the testicles make testosterone. The ovaries of females produce the hormone estrogen, which is important for developing and maintaining the female reproductive system. It stimulates the growth of sexual traits and the lining of the uterus, called endometrium. In females, the reproductive cycle is also controlled by estrogen hormones (1). The ovary's corpus luteum produces most progesterone after ovulation. Protecting the endometrium and reducing uterine contractions helps support pregnancy and prepare the uterus for implantation. During pregnancy, progesterone is also vital for growth and maintenance. The primary male sex hormone produced by the testicles is testosterone. Male reproductive organs and secondary sexual characteristics must mature and be maintained. In addition to promoting sperm production and libido, testosterone affects the reproductive behavior of males. Produced by the pituitary gland, prolactin regulates a female's ability to produce milk. During pregnancy, it stimulates the growth and development of the mammary glands, and after giving birth, it produces milk. The pituitary gland produces the reproduction-critical hormone oxytocin. During labor and delivery, oxytocin stimulates uterine contractions in females. In addition, it contributes to milk production during breastfeeding and helps strengthen the mother-child bond. Oxytocin is involved in regulating ejaculation and sexual arousal in males (2). Table 1 shows the hormonal function of the male and female reproductive systems. Figure 1 shows the hormone in the reproductive system of animals.

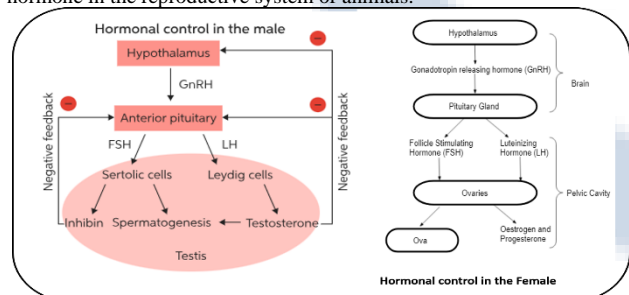


Figure 1: Hormone of the Reproductive System

### 2. Hormones of the female reproductive system

#### Follicle-stimulating hormone

It promotes follicle growth and maturation. Enhances estrogen production.

#### Luteinizing hormone

Stimulates ovulation and corpus luteum formation. Production of progesterone.

#### Estrogen Hormone

Female reproductive structures are developed and maintained by estrogen hormones. The reproductive cycle is regulated by endometrial development.

#### Progesterone Hormone

The female reproductive organ is made prepared for implantation. The endometrium is protected during pregnancy. It prevents contractions of the uterus. Increase in mammary gland size.

#### Prolactin Hormone

Females produce milk due to the hormone prolactin. Breast development and growth by prolactin hormones.

#### Oxytocin Hormone

Contractions of the uterus during labor and delivery through oxytocin hormones. The consumption of milk through oxytocin hormones while breastfeeding. The connection between mother and child (3).

Table No 1: The hormonal function of the male and female reproductive system

Sr. No	Hormones	Female Reproductive system	Male Reproductive system	Function of the Reproductive system
1	LH	Corpus Luteum (CL) formation	Testosterone stimulates production in Leydig cells	Regulates Production of Testosterone in Males. Triggers Ovulation, Progesterone Production in Females
2	FSH	Stimulates growth Hormones and Ovarian Follicles Maturation	Spermatogenesis is Stimulates in the Testes	Sperm production, Promotes growth in females follicle
3	Estrogen Hormone	Development of Endometrium and Menstrual cycle regulation	Nil	Female sexual development and regulation, Endometrial Growth
4	Oxytocin Hormone	Uterine Contractions and Milk Ejection	Sexual stimulation regulation and Ejaculation	Regulates Sexual Excitement and Ejaculation in Males. Stimulates Uterine Contractions, Milk Ejection, and Bonding in Females
5	Progesterone Hormone	Endometrium maintain during pregnancy	Nil	Supports Pregnancy, Inhibits Uterine Contractions
6	Testosterone Hormone	Female reproductive structures development and maintenance	Male reproductive organs development and maintenance through Testosterone	Regulates Male Sexual development, Influences Female Reproductive Structures
7	Prolactin Hormone	Milk production and Mammary glands development	Nil	Stimulates Milk Production in Females

### 3. Hormones of the male reproductive system

#### Follicle-stimulating hormone

##### Spermatogenesis in testes

FSH acts on the seminiferous tubules of the testes to increase sperm production. It supports the growth, maturation and development of sperm and ensures the continuous production of live and functional sperm.

##### Luteinizing Hormone

LH stimulates testosterone synthesis and secretion in testicular Leydig cells. The primary male sex hormone, testosterone, is required for every function of the male reproductive system.

##### Testosterone

#### Growth and maintenance of reproductive male organs

Testosterone is involved in the development and maintenance of male reproductive organs such as the testicles, prostate, and seminal vesicles. Support in the development, maturation, and operation of these structures.

#### Secondary sexual appearances

Testosterone influences male sexual characteristics such as sound deepening, body facial hair growth, and increased muscle mass.

#### Production of sperm in the testes

Testosterone is required to stimulate sperm production in the testicular seminiferous tubules. It conveys the signals required for spermatogonia separation and maturation into sperm.

#### Behavior and sexual desire

Testosterone is crucial in regulating male libido and behavior. Sexual arousal, the frequency of sexual thoughts and fantasies, and the initiation and maintenance of sexual activity are all influenced.

#### Role of prolactin hormones in the male reproductive system

Prolactin is mostly linked to the female reproductive system, but some research indicates that it may also affect male fertility. The testes and the prostate are two examples of the male reproductive organs that contain prolactin receptors. More research is required because the precise role and function of prolactin in males is not fully understood.

#### Role of oxytocin hormones in ejaculation

Oxytocin is known for its pivotal involvement in the intricate realm of female reproduction, yet it also exerts its influence upon the male reproductive system. It plays a significant role in the regulation of sexual arousal and the process of ejaculation. The release of oxytocin during sexual activity has a notable impact on the intensity and duration of sexual pleasure, as well as the contraction of smooth muscles during ejaculation (4).

### 4. Conclusion

Hormones play a crucial role in the functioning of the reproductive system in animals. In the female population, it is observed that follicle-stimulating hormone (FSH) plays a pivotal role in promoting the growth of ovum and facilitating the production of estrogen. On the other hand, luteinizing hormone (LH) is responsible for triggering the process of ovulation and stimulating the production of progesterone. In males, follicle-stimulating hormone (FSH) plays a crucial role in the stimulation of sperm production, while luteinizing hormone (LH) is responsible for stimulating testosterone production. Hormones collaborate within an intricate system to manage and synchronize the reproductive process and its temporal aspects. The maintenance of hormonal balance is achieved through the utilization of feedback mechanisms and negative feedback loops. It is of utmost importance to comprehend the intricate interplay of hormones when it comes to the diagnosis and treatment of fertility disorders, as well as the optimization of fertility. Hormone therapy may be employed to rectify imbalances in animals and facilitate the attainment of reproductive success.

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