



**FACULTY OF AGRICULTURAL  
SCIENCES AND ALLIED  
INDUSTRIES**

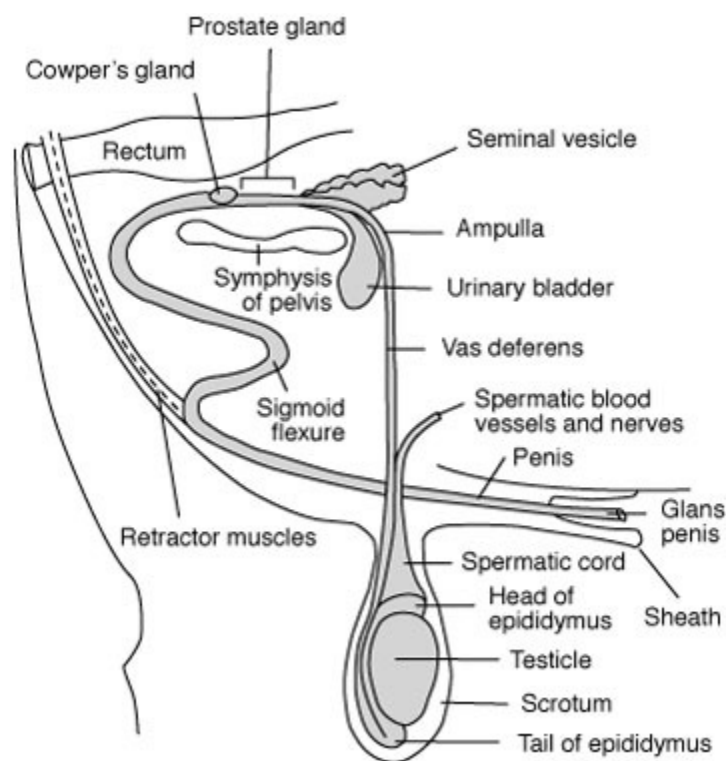
## 1. Male Reproductive System (Bull)

The male reproductive organs produce the male gametes, the spermatozoans.

These are introduced into female reproductive system, where they fuse with the sperm to form zygote.

The reproductive system (bull) is composed of the following parts;

- i). Testes
- ii). Epididymis
- iii). Sperm ducts
- iv). Accessory glands (Seminal vesicles and prostate glands)
- v). Penis



### The testis:

- There are two testes hanging loosely between hind legs.
- Enclosed by loose skin (scrotum) scrotum regulate temperature of testis for optimum production of sperms.
- Produce spermatozoa (sperms) which are stored in coiled tube called epididymis.

**Epididymis:** Storage of spermatozoa.

**Sperm ducts:**

- Conveys sperm from the testis and urine through the penis.
- sphincter muscles contract to allow each to pass separately.

**Seminal vesicles produce fluid called semen.** Semen carries sperms out of penis in fluid form.

Semen contains nutrients to the spermatozoan.

**Prostate gland** -produce fluid that neutralize the acidic effects of urine in the urethra preventing death of sperms.

**Accessory glands:** Include seminal vesicles cowpers gland and prostate gland. **Urethra:** Conveys urine and semen. One sperm fertilizes ovum

Penis:

Surrounded by a sheath which is an extension of skin.

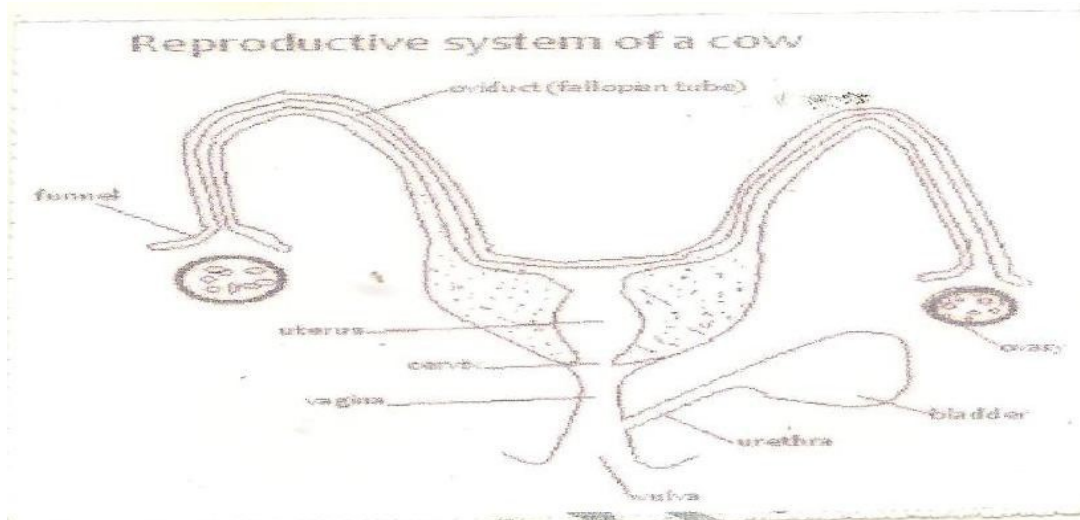
It introduces sperms into the vagina of a cow through the vulva during mating.

It is a copulatory organ, also used for urination.

## 2. The Female Reproductive System(Cow)

the reproductive system of a cow is composed of;

- i). Ovaries
- ii). Fallopian tubes
- iii). Vagina
- iv). Vulva
- v). Uterus



### **Ovaries and fallopian tubes(oviduct)**

Two ovaries located in abdomen, left and right. Produce ova/eggs and hormones which control sexual cycle. Oestrogen produced by graafian follicle inside ovary induces oestrus i.e. Heat period so that the cow shows signs of heat. The hormone oestrogen is produced under the influence of other hormone called the Follicle stimulating hormone.

After every 21 days the ovary releases a mature ovum and the cow comes on heat. The ovum travels through the fallopian tubes to the uterus.

The release and movement of the ovum down to the uterus is called **ovulation**. If mating is done at this time, fertilization will take place. The fertilized egg implants itself onto the endometrium(walls of uterus)and develops into foetus.

### **Fallopian tubes:**

Fertilization takes place here. Also a passage for the egg from the ovary to the uterus.

### **The uterus:**

Implantation takes place here and also embryo develops here.

**The cervix of the uterus:** Closes the uterus.

### **The vagina and Vulva:**

Vulva is the external opening of female reproductive system.

It allows mating to take place so that sperms are deposited into the vagina.

The foetus and urine are removed through the vulva.

### **Pregnancy**

is period between fertilization of ova and the expulsion of the foetus through the vulva. Also called **gestation period**. In cattle gestation period is 270-285 days. Ends with the birth of a calf.

The reproductive tract undergoes a period of rest during which it is repaired and returns to normal. During pregnancy, hormone called **progesterone** is produced by the placenta to maintain the foetus in the uterus.

Animal	Length of days
Cow	270-285 Days
Sow	113-117
Ewe/Goat	150
Rabbit	28-32

### **Parturition**

Act of giving birth called parturition. This time the foetus expelled through the birth canal.

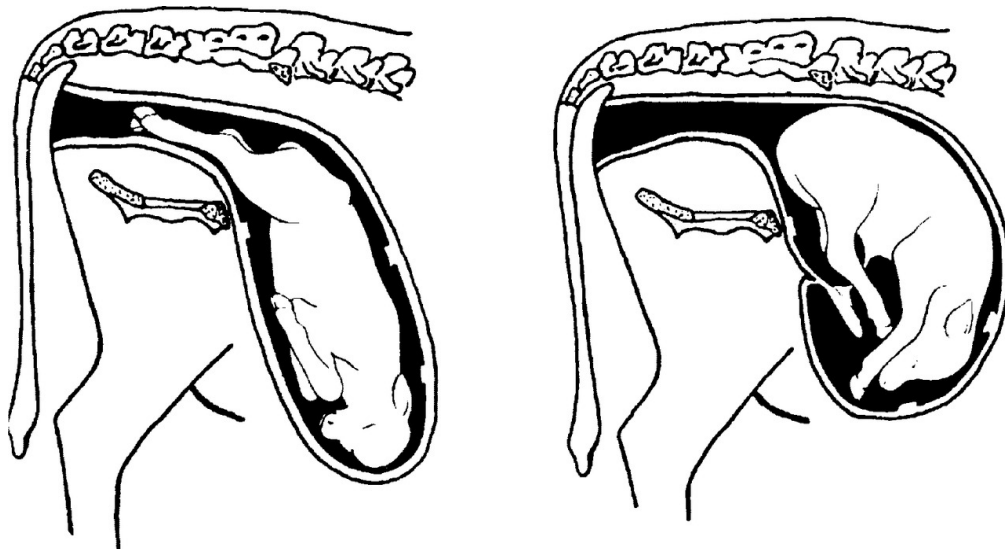
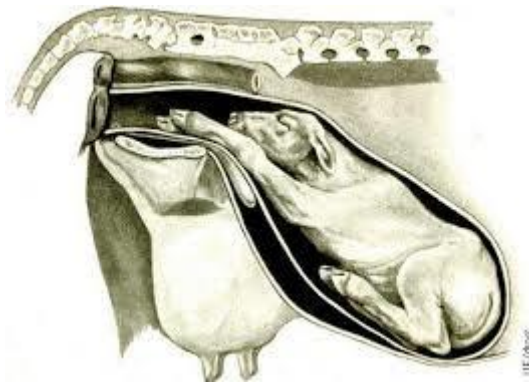
#### **When an animal is about to give birth, it shows signs;-**

- Distended udder which produces thick milky fluid called colostrums.
- Swollen vulva producing thick mucus like discharge.
- Loose and slackened pelvic girdle.
- Visible pin bones.
- General restlessness.

Animal parturates within 2-3 hours after this signs. The correct presentation is with the front feet first ,and the head outstretched and resting in between the feet.

Any other presentation called **mal-presentation or breech presentation** and

requires assistance.



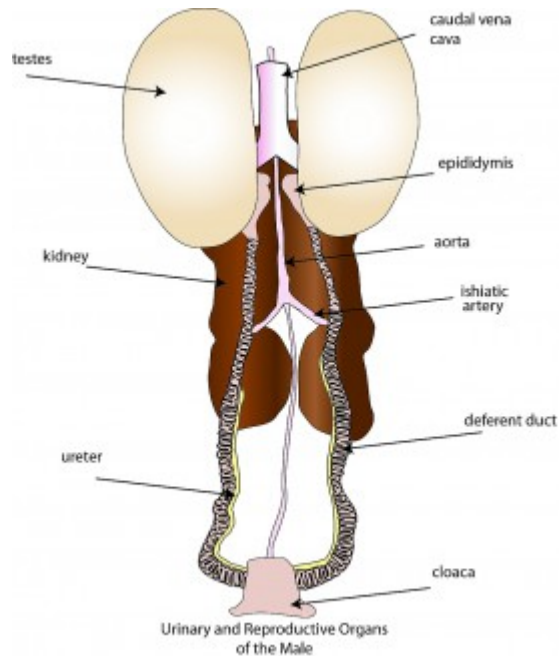
### 3. Reproductive system of poultry

The avian **reproductive system** is heterosexual and requires both a male and a female, each to contribute half of the genetic constitution of the offspring. The male contributes his half by way of the sperm produced by the testes and carried in the semen. The female contributes hers in the ovum carried by the egg yolk produced by the ovary. The ovum is often referred to as the **blastodisc**, **blastoderm** or **germ disc**. After release from the follicle on the ovary, the yolk moves into the oviduct where it is fertilised and has added to it the albumen, shell membranes and shell.

#### Male reproductive system

The male reproductive organs in the domestic fowl consist of two testes, each with a deferent duct that leads from the testes to the cloaca. Fowls do not have a

penis such as is found in other animals. The testes are bean shaped bodies located against the backbone at the front of the kidney. Their size is not constant and they become larger when the birds are actively mating. The left testes is often larger than the right. On the inside of each is a small, flattened area that is believed to correspond to the epididymis of mammals. The deferent duct starts at this flattened area.



The urinary and reproductive organs of the male chicken

### Deferent duct

The deferent duct transports the sperm from the testes where they are formed to the cloaca from which they enter the oviduct of the female when mating. The deferent duct enters a small pimple-like structure in the cloaca. This structure equates to the mammalian penis and is much larger in ducks to form a penis like organ. The deferent duct is quite narrow at first but widens as it approaches the cloaca.

### Testes and sperm

In the testes very twisted tubes called seminiferous tubules are found. It is in these tubules that a special process of cell division called meiosis and transformation produces the sperm. The sperm carry half of the total chromosomes required to produce an embryo. The mother provides the other half. One cubic millimetre of the fluid called semen produced by the male contains on average 3-5 million sperm. Under a microscope the sperm of the fowl will be seen to have a long pointed head with a long tail. The testes also produce hormones called **androgens** that influence the development of what are called secondary sex characteristics such as comb growth and condition, male behaviour and mating.

## Female reproductive system

The female reproductive system in the domestic fowl consists of the ovary and the accompanying oviduct. While the female embryo in chicken has two sets of reproductive organs, only one of these, the left survives and reaches maturity to produce eggs. The single surviving ovary is located in the laying hen just in front of the kidneys in the abdominal cavity and is firmly attached to the wall of the cavity. The ovary is well endowed with blood vessels to ensure there is no hindrance to the transport of nutrients to the developing yolk.

### Ovary

The ovary consists of a mass of yellowish, rounded objects called follicles, each containing an ovum or yolk. There are many such follicles but only a small number in comparison, will ever reach maturity to produce an egg. When the hen is in lay the ovary will be active. The size of the follicles will vary from very small to those approaching the normal yolk size in the egg which can be up to 40 millimetres in diameter, and will contain a fully matured yolk ready for release into the oviduct.

It is possible to find five stages of development in the active ovary:

1. Primary follicles – follicles that have not yet commenced to grow
2. Growing follicles
3. Mature follicles – follicles ready or nearly so for release
4. Discharged follicles – where the yolk has just been released
5. Atretic follicles – those from which the yolk has been released some time ago

### Yolk

It takes approximately 10 days for a yolk to develop from the very small to the normal size found in eggs and during this time it is contained in the follicle. The follicle acts as a sack during this period of development supplying it with the nutrients required for its growth. When a mature follicle is examined an elongated area virtually free of blood vessels will be found on the distal surface of it. This area, called the **stigma**, is where the follicle normally splits to release the yolk into the oviduct. If, for some reason, the follicle splits at other than the stigma, the numerous blood vessels that rupture will result in free blood being found in the egg i.e. a blood spot will form.

### Oviduct

The function of the oviduct is to produce the albumen, shell membranes and the shell around the yolk to complete



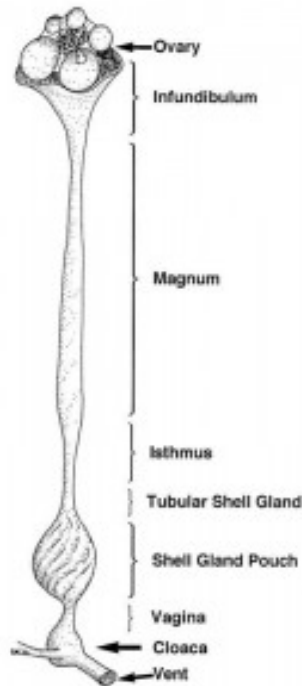


Diagram of the oviduct

the egg. It is a long tube well supplied with blood via numerous blood vessels. There are many glands found in its walls that produce the albumen, the shell membranes and the shell. In the non-layer the oviduct is quite short and small in diameter. However, once the reproductive system becomes active, it grows to a length of 70-80 centimetres with a variable diameter depending on the function of the section being examined.

The oviduct consists of five distinct parts or sections, each having different functions:

1. **Infundibulum (or funnel):** located adjacent to the ovary and with long segments enclosing the ovary, the infundibulum collects the yolk after its release from the follicle as a funnel and directs it into the oviduct. This section has very thin walls and is 6-9 centimetres long. Fertilisation of the ovum by the male sperm occurs here.
2. **Ampulla or magnum:** at approximately 40 centimetres long it secretes more than 40% of the albumen.
3. **Isthmus:** at about 12 centimetres in length, it secretes some albumen and the shell membranes.
4. **Uterus or shell gland:** at approximately 12 centimetres in length it secretes about 40% of the albumen and the egg's shell.
5. **Vagina:** at approximately 12 centimetres in length, it secretes the egg's outer cuticle and possibly the shell pigment.

### Androgen, oestrogen and progesterone

In addition to the production of eggs, the female reproductive system also produces hormones that aid in the control of body functions. These include

androgen, oestrogen and progesterone. Androgen causes comb growth and condition, and has a function in the formation of albumen. Oestrogen causes the growth of the female plumage, mating and nesting behaviour, oviduct development together with the nutrient supply to the ovary/oviduct for egg formation. Progesterone, with androgen, is involved in the production of albumen and the carriage of the message to the pituitary gland to release luteinising hormone.

The female reproductive system remains dormant in the young chicken and growing pullet until she reaches the age when these organs start to prepare for the normal production of eggs. One of the first signs of her developing maturity is the change in the comb development. This organ starts to grow and to take on a vivid red hue as the hormones produced by the now awakening ovary start to have an effect