

# DIGESTIVE SYSTEM

The digestive tract of any animal, including chickens, is important in converting the food the animal eats into the nutrients their body needs for maintenance, growth, and production eggs. Once food is eaten, it must be broken down into its basic components.

## Bird digestion types;

- 1-**Mechanical action:** Typically involves chewing, but since birds don't have teeth other Mechanical methods are used and will be discussed later in this publication.
- 2- **Chemical action:** Includes the release of digestive enzymes and fluids from the stomach, pancreas and liver. Once the nutrients have been released from food during digestion, they can be absorbed and distributed throughout the animal's body.
- 3- **A little of Microbial** digestion occur in the last portion of digestion tract ceca digest small amount of fiber.

## Bird digestion system consist of;

### 1. Beak / Mouth:

Most birds, food picked up by the beak enters the mouth. As known, chickens do not have teeth. The mouth does contain salivary gland secret saliva which wets the feed make it easier to swallow and digest starch. By **tongue** push the feed to esophagus.

### 2. Esophagus:

The esophagus is a flexible tube that connects the mouth with the rest of the digestive tract. It carries food from the mouth to the crop and from the crop to the proventriculus chicken use their tongue to push food to the back of the throat.

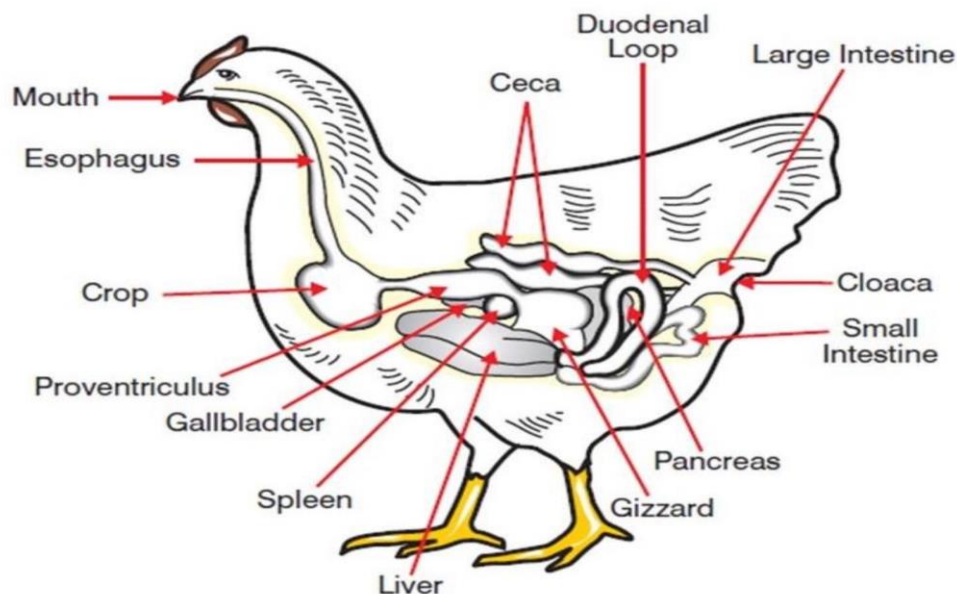
### 3. Crop:

The crop is an out-pocketing of the esophagus and is located just outside the body cavity in the neck region, crop function as the followings;

- 1- Store the feed until entered other next part it is simply a temporary storage pouch.
- 2- When the crop is empty, or nearly empty, it sends hunger signals to the brain so that the chicken will eat more.
- 3- Although salivary glands of the mouth secrete the digestive enzyme **amylase** very little digestion actually takes place in the crop –

Occasionally the crop becomes impacted or 'backed up' (**crop impaction**, also referred to as **crop binding** or **pendulous crop**). This may occur when chickens go a long time without feed, then chickens eat much too fast when the feed becomes available again. Chickens have a tendency to impaction when they eat in the pasture and eat too much.

## AVIAN DIGESTIVE SYSTEM



### Bird digestion system

**4. Proventriculus:** The esophagus continues past the crop to connect the crop to the proventriculus. The proventriculus (also known as the 'true stomach') is the **glandular stomach** where digestion begins. As with human stomachs, hydrochloric acid and

digestive enzymes (e.g., pepsin) are added to the feed here and digestion begins. At this point, however, the food has not yet been ground up. The term ‘proventriculus’ is used since it comes before the ‘ventriculus’ or gizzard, with ‘pro’ meaning before.

**5. Gizzard / Ventriculus:** The gizzard is a part of the digestive tract unique to birds. It is often referred to as the ‘**mechanical stomach**’. It is made up of two sets of strong muscles which act as the bird’s teeth. The function as the following;

1- Consumed feed and the digestive juices from the salivary glands and the proventriculus pass into the gizzard for grinding, mixing, and mashing. When allowed to free-range.

2-The stones/pebbles are weakened by the acidic environment created in the proventriculus and then are ground into tiny pieces by the strong muscles of the gizzard.

Chickens fed only commercially prepared feed do not need stones. If, however, **whole grains** are fed, it is necessary to provide small pebbles, typically given as **grit**. **Grit is a commercial product made up of small stones.**

**-Note;** It should not be confused with limestone or oyster shell which is given to laying hens as a source of calcium for their egg shells.

- When chicken keep in the pasture, eventually eat small pebbles.

- Gizzards have a thick lining which protects their muscles. When chickens are slaughtered, the gizzards are often saved, the lining removed. When a chicken eats a small, sharp object such as a tack or staple, the object is likely to get stuck in the gizzard.

- Chickens with damaged gizzards will grow thin and eventually die –a very good reason to keep your poultry houses free of nails, glass shards, bits of wire and the like.

**6. Small intestine:** The small intestine is made up of the duodenum (also referred to as the duodenal loop) and the lower small intestine. The **duodenum** receives digestive enzymes and bicarbonate(to counter the hydrochloric acid from the proventriculus from the **pancreas** and bile from the **liver** via the **gall bladder**. The digestive enzymes produced by the pancreas are primarily involved in protein digestion.

**Bile** is a detergent that is important in the digestion of lipids and absorption of fat soluble vitamins (vitamins A, D, E and K).

The remainder of the digestion occurs in the duodenum and the released nutrients are absorbed mainly in the **lower small intestine**. The lower small intestine is composed of two parts, the **jejunum** and **ileum**.

**The pancreas** plays important roles in both the digestive and hormonal systems. It secretes hormones into the blood system that are important in the regulation of blood sugar.

**Note:** In the developing embryo the yolk sac supplies the nutrients needed for it to develop and grow, before hatch, the yolk sac is taken into the navel cavity of the embryo.

#### - Ceca

The ceca are two blind pouches located where the small and large intestines join. Some of the water remaining in the fecal material is reabsorbed here. Another important **function** of the ceca is the fermentation it is a little of microbial fiber digestion.

In doing so they produce several fatty acids as well as the eight B vitamins (Thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folic acid and vitamin B12).

**7. Large intestine (colon):** Despite the name, the large intestine is actually shorter than the small intestine. The large intestine is where the last of the water re-absorption occurs.

**8. Cloaca:** There is a mixing of the digestive wastes together with wastes from the urinary system and the product of reproductive system. Fecal material is usually voided as digestive waste with white uric acid crystals on the outer surface (i.e., chickens do not urinate/pee). The color and texture of chicken fecal material can indicate the health status of the chicken's digestive tract. The white pasty material that commonly coats chicken fecal material is **uric acid**, the avian form of urine, and is normal.