



**Leaving Cert Agricultural
Science**

Free Notes

Animal Physiology

Animal Physiology

Metabolism:

- ✚ This is the chemical breakdown of food in an animal's body.

Two types of metabolism:

- ✚ **Anabolic Reactions:** the build up of simple compounds into larger complex ones i.e. making up of glucose in photosynthesis.
- ✚ **Catabolic Reactions:** the breakdown of food/large compounds into smaller units i.e. respiration (breakdown of glucose).

Nutrition:

- ✚ This is the obtaining of food for the survival of a living organism.
- ✚ **Two types:**
- ✚ **Heterotrophic** (fungi, animals) consume readymade food (glucose) from the environment (green plants).
- ✚ **Autotrophic** (Green plants) make their own food from chemical reactions they carry out (Photosynthesis).

The digestive system:

- ✚ Includes the following organs/parts: Mouth, teeth, oesophagus, stomach, Liver, pancreas, small & large intestine, rectum & anus.

Teeth

There are 4 different types of teeth in animals.

- ✚ Incisors (I)
- ✚ Canines (C)
- ✚ Premolars (P)
- ✚ Molars (M)

There is different dental formula across different species of the animal kingdom.

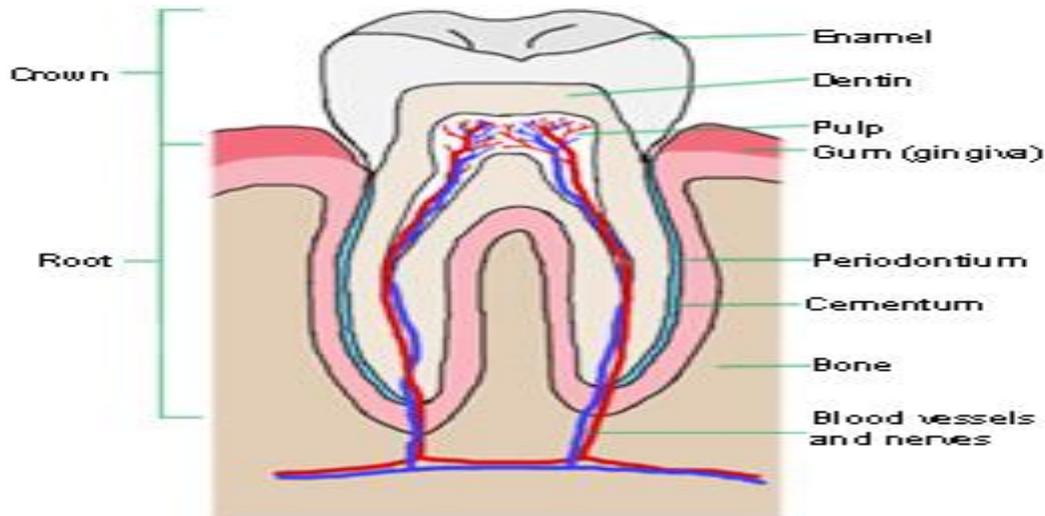
Dental formula:

Cattle & Sheep:

- ✚ **0 0 3 3** (upper jaw)
- ✚ **4 0 3 3** (lower jaw)

Pigs & dogs:

- ✚ **3 1 4 3** (upper jaw)
- ✚ **3 1 4 3** (lower jaw)



The 5 stages of digestion:

- + **Ingestion:** Food enters the mouth.
- + **Digestion:** food is physically & chemically broken down. Physical digestion occurs via teeth grinding, moving food down oesophagus & muscular contractions in the stomach.
- + **Absorption:** Food (mainly glucose) is taken into the bloodstream.
- + **Assimilation:** absorbed food is used in the body.
- + **Egestion:** removal of waste from the body.

Q) What is meant by peristalsis?

- This is the muscular contractions from the walls of the digestive system i.e. oesophagus & stomach.

Parts of the Digestive System:

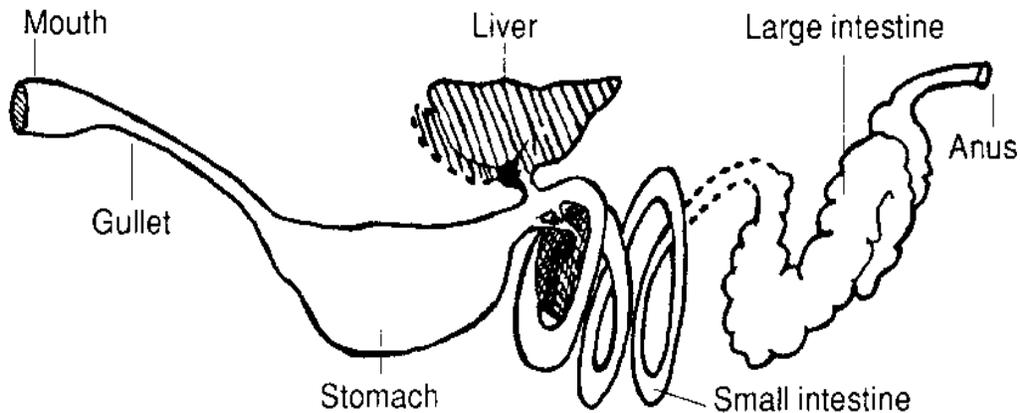
- + **Mouth:** food enters mouth; **saliva** from salivary gland **secretes** enzyme **amylase** to digest **starch** which is too big to be absorbed into the body and is broken firstly into **maltose** and **then** into **glucose** by **maltase enzyme**. Mucus binds food and helps with chewing.

Q) Describe briefly, the main differences between monogastric and ruminant animals

Monogastric	Ruminant
One true stomach.	4 chambers (rumen, reticulum, Omasum + Abomasum) in stomach
Pigs & humans	Sheep and cows

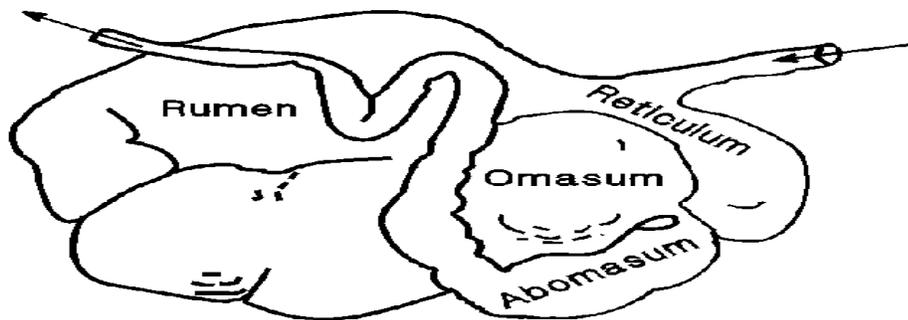
Q) Draw the structure of a named Monogastric digestive system.

Example: (Pigs)



Q) Draw a rough outline of a Ruminant animal's stomach

Example: cows + sheep



The ruminant stomach:

1. The Rumen

- ✚ **First & largest chamber** of the stomach. This allows the fibre of the food to be digested. **Protozoan's** can **digest fibre & cellulose**. These bacteria **form amino acids** and produce vitamin B for energy of the animal.

2. The Reticulum

- ✚ **Rumination** occurs i.e. regurgitation of food and is often called the “**chewing the cud**”.

3. Omasum

- ✚ This is the 3rd chamber. Food is **physically squeezed** and separates water that will be absorbed.

4. Abomasum

- ✚ This is the **true stomach** of the Ruminant. Digestive enzymes are released here to further digest food. **At birth calves & lambs ONLY have this chamber**. There is an adaptation for lambs & calves with a “**Oesophageal Groove**”.
- ✚ This means the **oesophagus & Abomasum is directly linked** for milk diet after birth.
- ✚ The enzyme **pepsin** (protein enzyme) breaks down protein here.

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