MAMMALIAN TEETH

Mammals have different types and shapes of teeth and they are thus termed **Heterodonts**. Those which have teeth of the same size and shapes are termed as **Homodonts**. In mammals teeth consist of an exposed portion known as a **crown** and a portion that is firmly fixed or anchored in a jaw bone called a **root**.

**Types of teeth in mammals**

There are 4 types of teeth in mammals and these include;

<table>
<thead>
<tr>
<th>1) Incisors</th>
<th>Structure of an Incisor</th>
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<tbody>
<tr>
<td>These are the front teeth in both the upper and lower jaws in man. The crowns are chisel shaped (sharp flat edge) and have only one root. <strong>Incisors are used for cutting food</strong></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2) Canines</th>
<th>Structure of a canine</th>
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<tbody>
<tr>
<td>These are found next to the incisors and they are normally long and pointed. They are poorly developed in herbivores and very prominent in carnivores. They have a conical shaped crown which is sharp and pointed. They have one root. <strong>They are used for tearing flesh.</strong></td>
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<thead>
<tr>
<th>3) Premolars</th>
<th>Structure of a premolar</th>
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<tbody>
<tr>
<td>These lie behind the canines on both jaws. These have flat broad surfaces which are used for grinding food. Premolars possess two or more <strong>cusps</strong> and <strong>ridges</strong> and have two roots. <strong>Premolars are used for grinding and chewing food.</strong></td>
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<table>
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<tr>
<th>4) Molars</th>
<th>Structure of a molar</th>
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<tbody>
<tr>
<td>They are absent in young mammals. These have wider crowns with more ridges and cusps compared to premolars. They may have three or more roots. <strong>Molars are used for grinding and crashing food.</strong></td>
<td></td>
</tr>
</tbody>
</table>
Note:
1. Elephant tusks are incisors.
2. Carnivores have a special type of teeth called the **carnassial** teeth which are adopted for cracking bones and scrapping (removing) of meat from bones.

**Internal structure of mammalian tooth**
Each tooth consists of a crown, Neck and root.

i) **Crown**: This is a region of the tooth which projects above the gum; it is used for breaking down food.

ii) **Neck**: This is the junction between the crown and the root.

iii) **Root**: This is the region which lies embedded in the jaw bone. It cannot be seen and it anchors / fixes firmly the root into the jaw bone.

**Vertical section through an incisor**

**Functions of the parts of the tooth**

i) **Crown**: this break down food into small particles during chewing, grinding and cutting.

ii) **Enamel**: this strengthens the tooth to enable it grind and cut. It protects the dentine and pulp cavity. It is the hardest material in the body. It is white in colour and made up of **calcium phosphate salts**.

iii) **Root**: this fixes the tooth into the jaw.

iv) **Dentine**: this strengthens the tooth.

v) **Pulp cavity**: this contains nerves that provide sensitivity to the tooth and blood vessels that transport food and oxygen to the tooth.
vi) Gum; this is fibrous which fixes or anchors the teeth firmly in the jaw. It is also called the gingiva.

vii) Cement; this is a thin layer of bone-like material that fixes the tooth in the jawbone.

Dental formula
This is a formula indicating the number of each type of teeth in half upper jaw and half the lower jaw. The dental formula gives evidence that the dentition of an animal is closely related to its diet. The number of teeth in the upper jaw is written above that of the lower jaw. The different types of teeth are represented by letters i.e.

Incisors-I, Canines-C, Molars M, Premolars-PM

The dental formula of an adult human is written as below:

\[ \frac{2}{2} ; \frac{1}{1} ; \frac{2}{3} ; \frac{3}{3} \]

\[ I \quad C^1 \quad PM^2 \quad M^3 \]

= 32

This means that man has 2 incisors on each half on the top and lower jaws, one canine on each half of the top and lower jaws, 2 premolars on each half of the top and lower jaws. Therefore man has 8 teeth on each half on the jaws which adds up a total of 32 teeth.

DENTAL FORMULAE
This is the convenient way of recording the number of each type of teeth in half upper jaw and half the lower jaw of a mammal.

Dental formulae of some animals

e.g. (I) 2/2, (C) 1/1, (P) 2/2, (M) 3/3 = 32

The figures above the line refer to the upper jaw, and those below the line refer to the lower jaw.

This means

Incisors (I) = 8, canines(C) = 4, premolars (PM) = 8, molars (M) =12

Carnivores e.g. dogs have dental formulae

(I) 3/3 (C) 1/1 (PM) 4/4 (M) 2/3 =42

Cows and sheep

(I) 0/3 (C) 0/1 (PM) 3/3 (M) 3/3 = 32

Rabbit

(I) 2/1 (C) 0/0 (PM) 3/2 (M) 3/3 28

DENTAL CARE
When food particles remain between and on the teeth, bacteria begin to grow on the particles and produces acid which eat away the enamel and dentine, making a hole in the tooth. If not treated the bacteria invade the pulp cavity and may result into diseases.

There are two major diseases of the teeth,

1. dental carries
2. periodontal diseases

Dental carries
This is caused due to the formation of a layer known as dental plaque which comes as a result of lack of constant cleaning of teeth. The microorganisms in the dental plaque convert sugar in the mouth to an acid. This dissolves the enamel and a small hole gradually develops. When the hole reaches the dentine and pulp cavity, a severe pain or toothache will be felt. This condition leads to the tooth being extracted.

Other causes are
- Prolonged exposure to sugary foodstuff
- Disturbance of saliva composition
- Lack of calcium and vitamin D for strengthening the teeth

Periodontal diseases
1. Pyorrhea. This is an infection of the fibres which are holding the tooth in its socket making it become loose.
2. Gingivitis. (Gum disease)
This causes the gums to bleed and if not treated the tooth becomes loose in their sockets and may fall off.

Periodontal diseases are characterized by inflammation of the gums. This involves; reddening of the gums, swelling of the gums, pain, bleeding, and even presence of pus.

Prevention of dental decay and proper care of teeth
- Visit a dentist regularly for checkup.
- Proper cleaning of teeth (brushing after meals)
- Avoid sweet sugary foods like sweets which encourage bacterial growth.
- Avoid opening bottles using teeth.
- Avoid eating very hot and very cold foods especially at a go since they result into alternate expansion and contraction since it leads to cracking or chipping of the enamel.
- Eating foods rich in calcium, phosphates and vitamins A, D, and C
- Exercising your teeth by eating hard fibrous foods like sugar canes, carrots, etc. This stimulates the flow of saliva which neutralizes acids formed by bacterial fermentation.

Carnivore dentition
Carnivorous animals such as dogs, cats and lions are adapted for feeding on other animals. Their teeth are adapted for capturing and killing other animals and tearing their flesh.
Their incisors are chisel shaped and enable them to grip and strip off pieces of flesh from bones.
Their canines are long, curved and pointed used for piercing the prey and preventing it from escaping.
The upper fourth premolar and the first lower molar are large and powerful. They are called **carnassial teeth**. They overlap like blades of scissors and are used for tearing and slicing flesh.
The other premolars and molars have jagged edges that fit perfectly together making them ideal for cracking bones.

**Diagram showing dentition in the carnivore e.g. a dog**

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**Herbivore dentition**

Herbivorous animals e.g. cows, goats and elephants eat plant foods such as grass, leaves and small stems. Their teeth are adapted for crushing and grinding vegetables. Their incisors and canines are chisel shaped and only found in the lower jaw. In the upper jaw, the incisors and canines are replaced by a thick horny pad. Grass and other vegetables are gripped between the incisors and canines on the lower jaw and the horny pad. Between the front teeth and the cheek teeth is a large gap called **diastema**. It provides space for the tongue to manipulate vegetation in such a way that the material being chewed is kept away from that which is freshly gathered.

**Dentition of a sheep**