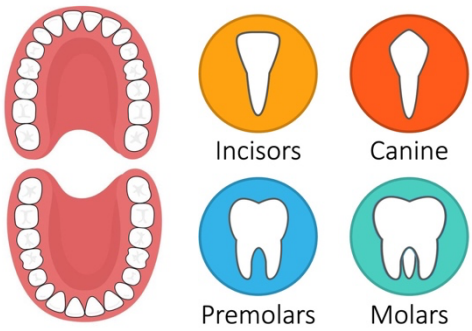
Dentition and Diet

Introduction



Mammals have teeth that are adapted to eating certain types of food. There are four main types of teeth involved in feeding:

- Incisors: chisel-shaped and used for biting or cutting food
- Canines: pointed teeth used for holding and tearing prey
- Premolars: flat and uneven teeth used to grind and crush
- Molars: larger and further back in a jaw for heavy grinding

The size, shape and distribution of these teeth are correlated with the different diets of mammals. The herbivores usually lack canines and have a gap (called a diastema) to enable the repositioning of food while chewing, while carnivores have specialised premolars with jagged, triangular edges for cutting meat (carnassial teeth). Omnivores commonly have wide front teeth (with chiselled edges) for biting off chunks of meat or plant material. Mammals with plant-based diets will tend to have thicker teeth.

Aim

To determine the relationship between dentition and the dietary requirements of mammalian species.

ACTIVITY 1: Digital Teeth Models

Inspect the digital teeth models on the Bioninja website: https://ib.bioninja.com.au/teeth-models/

- Compare the mandibles of the cow (herbivorous), wolf (carnivorous) and macaque (omnivorous)
- Analyse the mandibles of an early hominin *(Ardipithecus ramidus)* and a modern *Homo sapien*

1. Use the model of the cow mandible to identify the dental features that support an herbivorous diet

2. Use the model of the wolf mandible to identify the dental features that support a carnivorous diet

3. Use the model of the macaque mandible to identify dental traits that support an omnivorous diet

4. Compare and contrast the dental composition of the two hominin models (early versus late)

5. Use evidence from the two hominin models to predict the possible differences in their diets

ACTIVITY 2: Physical Teeth Models

Hominin teeth have evolved from being larger structures used for diets involving tough plant matter to smaller structures used for diets that include soft meats. Canines have become reduced (due to less male-male fighting), molars are smaller (due to softer cooked foods) and shovel-shaped incisors have become more predominant (highlighting a shift to a more omnivorous diet).

1. Compare the mandibles of a variety of hominin skulls and use an awareness of teeth composition to determine the relative ages of the different fossils (i.e. earlier hominin versus later hominin).