Animal Nutrition and the Skeletal System

Nutrition

Nutrition is a life process by which living things make or eat food and absorb its nutrients. Plants can make their own food. They make food in their leaves. Animals cannot make their own food. They need to find food to eat.

Carnivores, herbivores and omnivores

Animals can be carnivores that eat meat, herbivores that eat plant parts, or omnivores that eat both meat and plant parts.



Tigers are carnivores.



Deer are herbivores.



Badgers are omnivores.

Omnivorous humans

Humans are omnivores because they can eat both meat and plant parts. The fossils of ancient humans show that humans have always been omnivores because they have sharp teeth for tearing meat and flat teeth for grinding plants.



Different human diets

Even though humans are omnivores, some humans choose to eat other diets. People who eat plant parts and animal products, but no meat, follow a vegetarian diet. People who only eat plant parts and products made from plants follow a vegan diet.

Balanced diet

All humans need a balanced diet, whether they eat a typical omnivorous diet or are vegetarian or vegan. A balanced diet contains foods from different food groups in the right proportions. It provides the human body with the energy and nutrients it needs to grow and stay healthy. There are five main food groups:

Fruit and vegetables

Foods in this group contain vitamins and minerals that help the body to fight off diseases. They also contain fibre that is important for the health of our digestive system.



Carbohydrates

Foods in this group contain important nutrients and are the body's main source of energy. They also contain fibre.



Proteins

Foods in this group contain a nutrient called protein that helps the body build muscle and allows it to grow and repair.



Dairy and alternatives

Foods in this group contain a nutrient called calcium, an important mineral for healthy bones, nails and teeth.

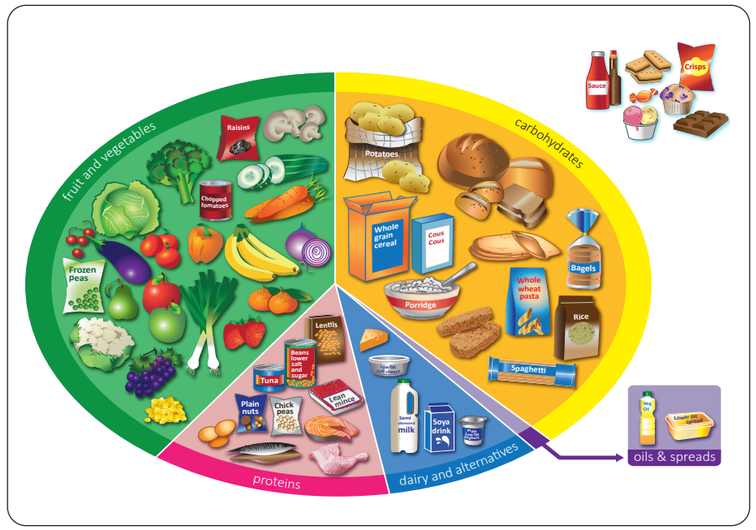


Oils and spreads

Foods in this group contain fat, which helps the body absorb certain vitamins and provides essential nutrients. However, oils and spreads should only be eaten in small amounts.



Eatwell guide



The Eatwell guide shows the proportions of foods from the five main food groups that humans should eat for a healthy, balanced diet. Sugary, salty and fatty foods are outside the Eatwell plate because they are not part of a balanced diet. Some humans do not eat this type of healthy, balanced diet. They either eat too much food, too little food or the wrong types of food. This can result in malnutrition, meaning poor nutrition, which causes health problems.

Seasonal changes in animals' diets

In the wild in the United Kingdom, animals' diets change over the year depending on the season. This is because certain foods become available and unavailable due to the weather and events that happen during spring, summer, autumn and winter.

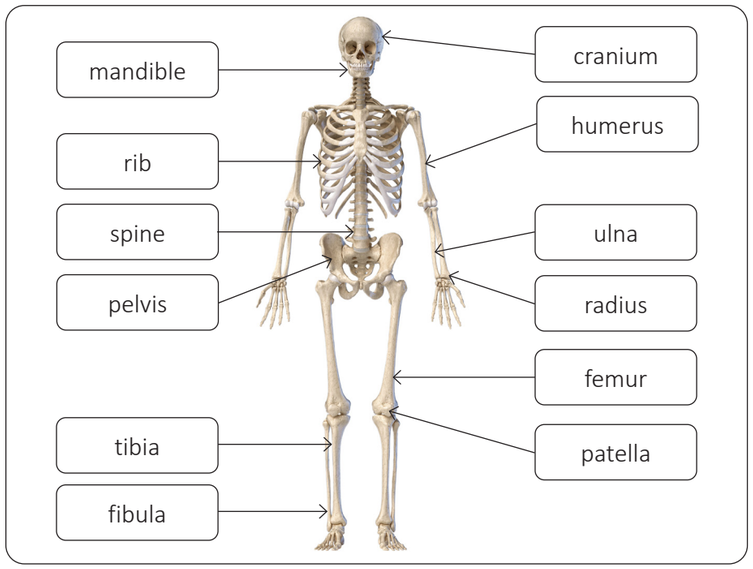
For example, the barn swallow eats flying invertebrates in the United Kingdom in spring and summer but migrates to South Africa in the autumn, spending winter there because the weather is warmer and there are more flying invertebrates to eat in South Africa.



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The human skeleton

The adult human skeleton is a frame of 206 bones that supports the body and gives it shape. It allows the body to move and protects soft, internal organs like the brain, heart and lungs.



major bones in the human skeleton

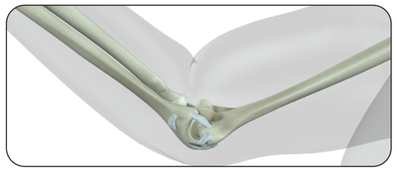
Most vertebrates have a similar skeleton to humans, with many of the same bones. However, the position or size of the bones vary in each skeleton.

Joints

A joint is a place where two or more bones meet and connect. Vertebrate skeletons have many bones connected by joints to move and bend body parts in different directions. Three types of joints in the human skeleton include the:

Hinge joint

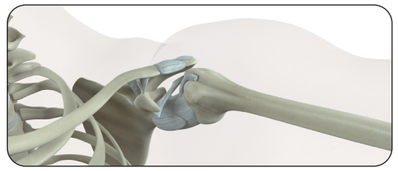
This joint can open and close in one direction only. The elbow joint is a hinge joint.



elbow joint

Ball and socket joint

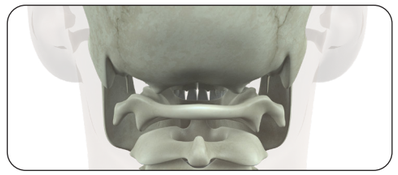
This joint allows movement in all directions. The shoulder joint is a ball and socket joint.



shoulder joint

Pivot joint

This joint only allows limited rotating movements. The top two spinal vertebrae form a pivot joint.

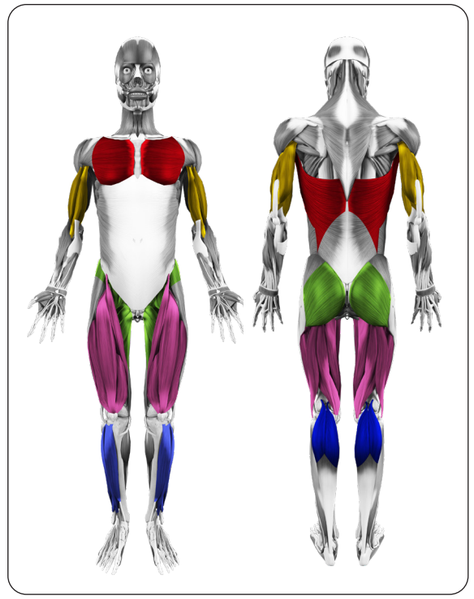


top two spinal vertebrae

Muscles

Muscles are soft tissue made up of many stretchy fibres. They allow the body to move, breathe and digest food. There are three main types of muscle in the human body: smooth muscle in the intestines, skeletal muscle attached to the skeleton and cardiac muscle in the heart.

Skeletal muscles are attached to the skeleton by flexible cords called tendons and work together in pairs, one contracting and one relaxing, to create specific movements.



muscle pairs in the human body

Skeleton types

An **endoskeleton** is found inside all vertebrates. It grows with the body and offers support but no protection to the outside of the body. An **exoskeleton** is found outside the body of invertebrates. It offers protection for soft body parts but does not grow with the animal and does not support a large body size. Some invertebrates have no skeleton. They can squeeze into small spaces, but have no protection from injury.



A human has an endoskeleton.



A scorpion has an exoskeleton.



An octopus has no skeleton.

Glossary

invertebrate	An animal without a spine.
nutrient	A substance that plants and animals need to grow, live and stay healthy, including vitamins and minerals.
vertebrae	One of the small bones that form the spine.
vertebrate	An animal with a spine.

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