1·5 Mammals as Consumers

Enzymes:

* Bile is not an enzyme.

Pepsin - needs acidic conditions to work → HCl in stomach does this.
* acts on Proteins → polypeptides.

Amylase - digests/breaks down starch → maltose → glucose.

Lipase - digests fats → 'emulsification'.

Trypsin - completes digestion of proteins alongside pepsin (in stomach) (after)

Pancreas ↓ (made in concoction of pancreatic juice).
Duodenum (Where enzymes work)

Respiration

glucose + O_2 → CO_2 + H_2O + ATP
- **aerobic** - 38 ATP
- **anaerobic** - 2 ATP + lactic acid.

Digestion

Peristalsis = contraction of muscles, throughout entire digestive tract. (moving bolus/chyme).

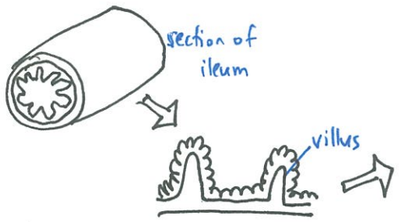
Physical (mechanical)
* definition: processing large pieces of food into many smaller pieces, creating surface area for enzymes to act efficiently on.
- teeth chewing
- stomach churning

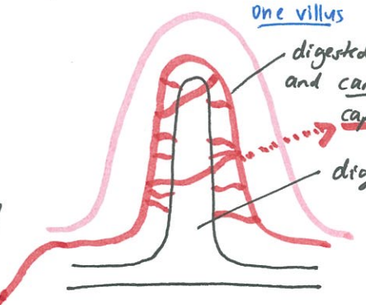
Chemical
- **enzymes**
  - biological catalysts
  - speed up reactions
  - never used up themselves
  - have optimal pH and temperature (denatured if in unfavourable environment)
  - specific to substrate
  - specific shape of active site.

- saliva in mouth
  - salivary amylase (species-specific) - starch → maltose
    - ↳ optimal pH = ~7·5

Absorption:

wall of ileum folded into villi.
* Villi contain microvilli.
* Lining of epithelium thin for rapid transfer.





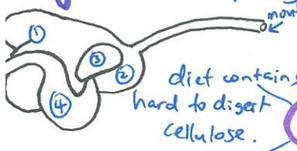
hepatic portal vein (carries oxygenated blood) (takes nutrients absorbed to liver for storage).

Assimilation:

= once nutrients absorbed → they can be 'assimilated' which means; used by cells for fuel, stored until needed (e.g liver storing glucose as glycogen), broken down into other substances (e.g excess amino acids (in liver) → urea), used by organs to make new substances.

Egestion = expelling undigested waste via anus.

Cow digestion

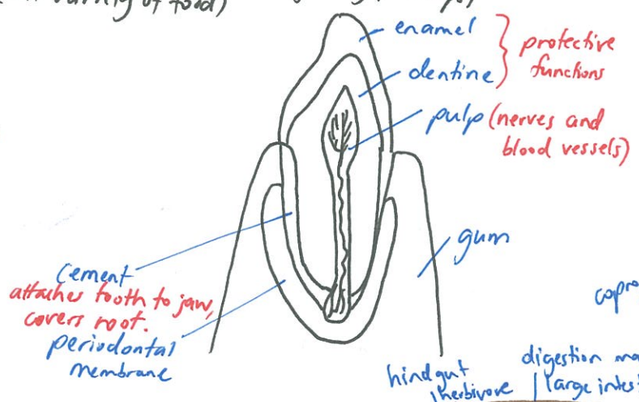


- diet contains hard to digest cellulose.
- "chew the cud"
- large tongue
- foregut herbivore
- grip grass with incisors
- Chew in circular motion using upper bony pad.
- molars flat 'crushing' and 'grinding'
- fermentation by bacteria and other microorganisms
  - ① Rumen
  - ② Reticulum
  - ③ Omasum
  - ④ Abomasum

teeth

- **incisor**: bite and cut
- **canine**: tear/rip food
- **molar**: grind and crush
- **premolar**: grind and crush (generally 4-5 cusps)

dental formula: I/C/Pm/M e.g 2123 (eat variety of food)



Rabbit Digestion

- hindgut herbivore
- coprophagy
- digestion mainly in large intestine
- no digestion in stomach
- teeth grow continuously
- caecum and appendix
- microbes for
- trypsin, amylase, lipase present.
- *epiglottis = flat preventing food entering trachea (respiratory system)

main food components

carbohydrates: broken down into glucose for respiration.
starch = glucose + glucose + glucose + glucose (= polysaccharide).

proteins: broken down into amino acids (used to form new proteins)
- enzymes
- growth
- repair
* chain of amino acids = polypeptide

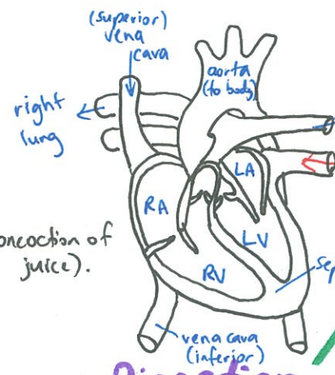
fats: broken down 'emulsified' into fatty acids and glycerol.

Tissue fluid:

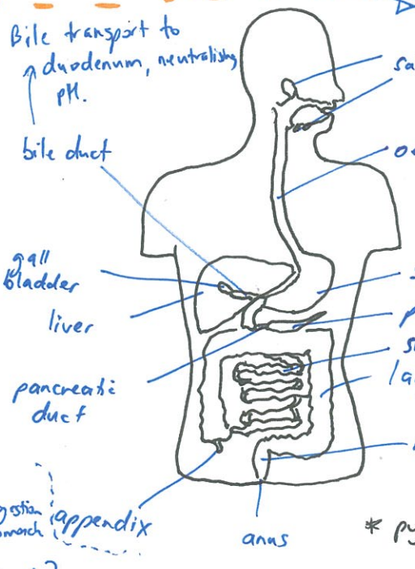
body cells surrounded by this. Dissolves substances i.e O_2 and CO_2 for diffusion from cells to blood.

Circulatory System:

3x Blood vessels:
① Arteries: away from heart - thick muscular wall, narrow lumen
② Veins: towards heart. HIGH PRESSURE, LOW PRESSURE - thin wall, wide lumen, valves
③ Capillaries: wall = 1x single flat cells joined



- arteries = oxygenated blood: except pulmonary artery
- veins = deoxygenated blood: except pulmonary vein.



* need to know function of each organ/structure.

* pyloric sphincter = muscle controlling release of chyme into duodenum.