Gas Exchange: The Gut

- 5. The Inside of the intestine wall is covered in millions of tiny little projections called villi.
- 6. These increase the surface area in a big way so that digested food is absorbed quicker into te blood.
- 7. Villi are covered in microvilli which increase the surface area further and increase absorption.
- 8. Villi have a good blood supply so that absorption into the blood can be quicker.



- Made of columns of Aurg cells with small frees allow surf to How through.
- They transport food substances (mainly dissolved sugars) made in the leaves to growing regions (e.g. new shoots) and storage organs (e.g. root tubers) of the plants.
- The transport goes in both directions.

Sieve tub Companion

Xylem

- Made of dead cells joined end to end with no end walls between them and a hole down the middle.
- They carry water and minerals from the roots to the stem and leaves in the transpiration system.



Homeostasis: The kidney

Kidneys Perform 3 Main Roles:

- I. Removal of **urea** from the blood
- 2. Adjustment of jons
- 3. Adjustment of water content of the blood

I. Removal of Urea

- Proteins can't be stored by the body so any excess amino acids are converted into fats and carbohydrates, which can be stored.
- This process occurs in the liver. Urea is produced as a waste product from these reactions.
- Urea is poisonous, its released into the bloodstream by the liver.
- The kidneys then filter it out of the blood, it is temporarily stored in the bladder in urine until it is excreted from the body.
- Protein molecules are too large to pass into the kidney.

2. Adjustment of Ion Content

- lons such as sodium are taken into the body in food and then absorbed into the blood.
- If the ion content of the body is wrong, this could upset the balance between ions and water, meaning too much or too little is drawn into cells by osmosis.
- Excess ions are removed from the blood by the kidneys. For example, a salty meal will contain too much sodium so some of it is removed from the blood by the kidneys. otesale.co.uk
- Some ions are lost in sweat.
- The balance is always maintained by the kidneys.

3. Adjustment of Water Content

of flink and lost in three Water is taken into the body as food

- I. In Urine
- 2. In sweat
- Page 13 3. In the 2 ve preathe out
- The body has to constantly manage water coming in and water going out.
- On a cold day if you dont sweat you'll produce more urine which is pale and dilute (less concentrated)
- On a hot day if you sweat you'll produce less urine that is dark and concentrated (more concentrated)

Nephrons are the Filtration Units in the Kidney

I. Ultrafiltration

- A high pressure is built up which squeezes water, urea, ions and sugar out of the blood and into the Bowman's capsule.
- The membrane between the blood vessels and the Bowman's capsule acts like a filter, so big molecules like proteins and blood cells are not squeezed out, they stay in the blood.



I. More Methane in the Atmosphere

- I. Rice is grown in warm, waterlogged conditions, ideal for decomposers, these organisms produce a lot of methane so more is released
- 2. Cattle produce methane so rearing cattle means more methane is released

2. More Carbon Dioxide in the Atmosphere

- I. Carbon dioxide is released when trees are burnt to clear lands
- 2. Microorganisms feeding on bits of dead wood release carbon dioxide as a waste product of respiration

3. Less Carbon Dioxide Taken in

I. Cutting down loads of trees means that the amount of carbon dioxide removed from the atmosphere during photosynthesis is reduced

4. Less Biodiversity

- I. Biodiversity is the variety of different species in a habitat the more species, the greater the biodiversity
- 2. Habitats like tropical rainforests can contain large number of different species, so when they are destroyed there is a danger of many species becoming extinct - biodiversity is reduced
- 3. This causes a number of lost opportunities e.g. there are probably loads of useful products that we will never know about because the organisms that produced them have become extinct.

- Peat Bogs
 Bogs are areas of land that are acidic and waterlogged the Brothat liv in them don't fully decay when they die due to a lack of oxygen.
- The plants rot and this releases CO2 which is built up and store Ch the bog.
 However these bogs are drained and the peat stars d Compose releasing CO2 into the atmosphere.

Biofuels

An increase in global warming may lead to:

- Big changes in the earths climate
- Rises in sea levels
- Reduce biodiversity
- Changes in immigration patterns in animals
- Fuels can be made by fermentation of natural products; waste products can often be used
- Fermentation is when bacteria or yeast break down sugars by anaerobic respiration

Ethanol

I. Yeast make ethanol when they break down glucose by anaerobic respiration

Glucose -> Ethanol + Carbon Dioxide + Energy

2. Sugar cane juices can be used, or glucose can be derived from maize starch by the action of carbohydrase

3. The ethanol is distilled to separate it from the yeast and remaining glucose **Biogas**