Edexcel (A) Biology A-level

1.11 to 1.15 - Energy, Carbohydrates, and Fats

Flashcards

What are the consequences of energy imbalance?

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If a greater amount of energy is burned through exercise than is consumed, it leads to weight loss. If a greater amount of energy is consumed than is burned through exercise, it leads to weight gain.

What do carbohydrates consist of?

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Chains of single units, called saccharides. Contains only carbon, hydrogen and oxygen.

Differentiate between the types of saccharides.

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- Monosaccharide= single sugar monomer.
- Disaccharide= two monosaccharides.
- Polysaccharide= many monosaccharides.

How are di and polysaccharides formed?

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Monosaccharides join to form di and polysaccharides through condensation reactions (meaning a molecule of water is released). Glycosidic bonds are formed. Can be broken by adding water (hydrolysis).

Give two examples of monosaccharides and their functions.

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- Glucose (six carbon atoms), main substrate for respiration.
- Ribose (five carbon atoms), component of DNA and RNA.

Give three examples of disaccharides and their component monosaccharides.

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- Maltose (two glucose molecules)
- Sucrose (glucose + fructose)
- Lactose (glucose + galactose)

Give two examples of polysaccharides and their function.

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- Glycogen
- Starch

Both energy storing molecules (glycogen in animals, starch in plants).

Relate the structure of glycogen to its function.

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Highly branched, meaning the molecule can be easily hydrolysed to release energy quickly.

Relate the structure of starch to its function.

Relate the structure of starch to its function.

Mixture of two polysaccharides;

- Amylose = coiled to make the molecule compact, so large amounts can be stored.
- Amylopectin = highly branched, so energy can be released quickly.

Explain how a triglyceride is formed.

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One molecule of glycerol forms ester bonds with three fatty acids through condensation reactions.

Differentiate between saturated and unsaturated fats.

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- Saturated fats have no C=C bonds, and are solid at room temperature due to strong intermolecular forces.
- Unsaturated fats have one or more C=C bonds, and are liquid at room temperature due to weak intermolecular forces.

What is meant by a high-density lipoprotein?

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Made of triglycerides from unsaturated fats combined with protein. Reduces blood cholesterol by transporting it to the liver to be broken down. They are known as ‘good’ lipoproteins.

What is meant by a low-density lipoprotein?

What is meant by a low-density lipoprotein?

Made of triglycerides from saturated fats combined with protein. Blocks receptor sites, reducing cholesterol absorption. They are known as ‘bad’ lipoproteins.

How do LDLs contribute to risk of cardiovascular disease?

How do LDLs contribute to risk of cardiovascular disease?

The high blood cholesterol level caused by LDLs leads to formation of atherosclerosis plaques. This is a causal relationship.