



Nutrition

Energy Balance

Lesson 1

Become an expert at understanding energy balance in the body and how it can be controlled.





Learning objectives

- Define what energy is used for in the body
- Outline how energy is created by the body
- State how energy is measured
- Identify the energy density of macronutrients
- Describe what BMR is and how it is calculated using the Harris-Benedict formula
- Recognise the physical activity levels (PAL) for low, moderate and high activity
- Calculate energy expenditure





Learning objectives

- Identify estimate average requirements (EAR's) of energy for the UK population
- Explain equal energy balance, positive energy balance and negative energy balance
- Describe how to correct positive energy balance
- State how physical activity can affect energy balance
- Summarise the amount of calories used by the body to carryout various activities
- Recognise how portion size can affect energy balance
- List recommended portion sizes in a healthy diet





Food and drink are consumed to give the body energy. The body needs energy to survive and function effectively on a daily basis.





The right amount of energy is required by the body to ensure all the bodies organs can function efficiently, temperature maintenance of the body, growth and to be active.





Energy the body uses comes from calories that are consumed through food and drink.



**Energy comes from the
oxidisation of the
macronutrients fats,
carbohydrates,
protein and alcohol.**





After food is eaten the bodies digestive system uses enzymes to produce amino acids from proteins, convert fats into fatty acids and carbohydrates into simple sugars such as glucose.





Amino acids, fatty acids and sugar are used by the body as sources of energy when they are required.





Energy is measured in either kilocalories (kcal) or kilojoules (kJ).

1 kcal = 4.18 kJ





The amount of energy which is generated from each of the macronutrients is different.





Macronutrient energy:

- Fat contains 9 kcal per gram
- Alcohol contains 7 kcal per gram
- Protein contains 4 kcal per gram
- Carbohydrate contains 3.75 kcal per gram (sometimes rounded up to 4 kcal per gram)





Energy density is the amount of energy a food contains per gram.





Fat is the most energy dense macronutrient and carbohydrate is the least energy dense.





Low energy density foods:

- Lean protein
- Vegetables
- Fruit
- Food high in fibre





High energy density foods:

- Cakes
- Chocolate
- Deep fried foods
- Butter and oils





The amount of energy in a food is listed on food label information, so you can become aware of how many calories are being consumed.





The amount of energy in food can be calculated by burning food and measuring how much heat is generated. This is performed in a scientific laboratory environment.





Revision Activity 1

List some high energy density foods?