

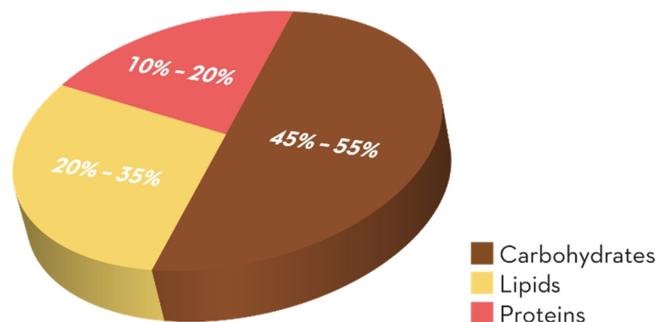
## The calorific value of nutrients

### ENERGY

The body constantly needs energy. Not just to walk, run and undertake physical effort, but also just to breathe, pump blood, keep the heart beating and ensure the brain works properly.



Proteins, carbohydrates and fats are the nutrients that provide the body with this energy. We refer to them as the **energy-containing nutrients**. The energy needs of adults are judged to be about 2000 kilocalories a day.



Ideally, energy needs should be covered by about 50% carbohydrates, a third fats and the rest by proteins.

Nutrients		Calorific value
	Proteins	4 kcal/g
	Carbohydrates	4 kcal/g
	Lipids	9 kcal/g

Energy nutrients do not all provide the same amount of kilocalories. Carbohydrates and proteins provide 4 kilocalories per gram while fats provide almost twice that amount. A gram of fat provides 9 kilocalories.

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Nutrients which are not immediately used to meet our energy needs are stored as a reserve. Carbohydrates are stored in the liver and muscles, while lipids are stored in adipose tissue. The body needs these reserves for a very simple reason: While we continuously expend energy, we do not eat non-stop!

## PHYSICAL ACTIVITY

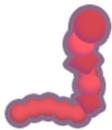
The energy expended during physical activity is proportionate to the duration and intensity of the effort carried out.



**Carbohydrates** are used as a source of energy at the beginning of any effort, especially if it is intense. They can be exhausted after 2 to 3 hours of continuous, medium intensity exercise or of 30 minutes intense, brief, repetitive exercise.



**Lipids** take longer to activate but are also useful for physical activity alongside carbohydrates. They are called on to help more when effort is prolonged and of moderate intensity.



**Proteins** also provide energy but they primarily play a role in building the body.

## The calorific value of nutrients

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Which nutrients play an essential role in building the body?

- Lipids
- Proteins
- Carbohydrates

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The amount of energy expended in physical activity depends on the length and intensity of the activity.

- True
- False

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Which nutrients provide the most energy?

- Lipids
- Proteins

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Which nutrients should provide a third of our daily energy requirements?

- Lipids
- Carbohydrates
- Proteins

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Which nutrients should provide half of our daily energy requirements?

- Lipids
- Carbohydrates
- Proteins

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Where are lipids stored?

- In adhesive tissue
- In adipose tissue
- In adipose tissue

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What is our estimated daily energy requirement?

- 2000 kilocalories
- 2500 kilocalories
- 3000 kilocalories

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What happens to carbohydrates and lipids if they are not used immediately?

- They are stored.
- They are flushed out.

---

Energy-giving nutrients all contain the same number of calories per gram.

- True
- False

## Answers

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Which nutrients play an essential role in building the body?

**Lipids**

*Wrong! Lipids mainly provide your body with a reserve of energy.*

**Proteins**

*Well done! Proteins are part of the structure of your muscles and skin.*

**Carbohydrates**

*Wrong! Carbohydrates provide the energy needed for your body to function.*

---

The amount of energy expended in physical activity depends on the length and intensity of the activity.

**True**

*Well done! We do not burn the same amount of energy when we run compared to when we walk.*

**False**

*Wrong! That's not the correct answer.*

---

Which nutrients provide the most energy?

**Lipids**

*Well done! Lipids provide 9 kcal/g, whereas proteins provide only 4 kcal/g.*

**Proteins**

*Wrong! That's not the right answer.*

---

Which nutrients should provide a third of our daily energy requirements?

**Lipids**

*Well done! That's correct!*

**Carbohydrates**

*Wrong! Carbohydrates should cover around half our daily energy requirements.*

**Proteins**

*Wrong! That's not the right answer.*

---

Which nutrients should provide half of our daily energy requirements?

**Lipids**

*Wrong! Lipid intake should be lower.*

**Carbohydrates**

*Well done! That's right!*

**Proteins**

*Wrong! Protein intake should be lower.*

---

Where are lipids stored?

**In adhesive tissue**

*Wrong! Try again!*

**In adipose tissue**

*Well done! That's right!*

**In adibou tissue**

*Wrong! That's not the right answer.*

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What is our estimated daily energy requirement?

**2000 kilocalories**

*Well done! This is just an average figure. Our requirements vary according to age, gender and physical activity.*

**2500 kilocalories**

*Wrong! It's less than that.*

**3000 kilocalories**

*Wrong! It's much less.*

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What happens to carbohydrates and lipids if they are not used immediately?

**They are stored.**

*Well done! Carbohydrates are stored in your liver and muscles, and lipids are stored in your adipose tissue.*

**They are flushed out.**

*Wrong! Your body plans ahead! It thinks about times when there will be shortages.*

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Energy-giving nutrients all contain the same number of calories per gram.

**True**

*Wrong! Try again!*

**False**

*Well done! Lipids provide more energy than proteins and carbohydrates.*

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## Comparison between the human body and a house

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*[8-10 years old and 11-13 years old]*

We can compare the role played by nutrients in the body with the elements in a house.

Visuel : [maison.jpg](#)



Fill in the blanks with the correct nutrients (**carbohydrates, proteins, vitamins, minerals, lipids**)

Watch out! You can only use each nutrient once.

- \_\_\_\_\_ play a building role, similar to the walls and roof of a house.
- \_\_\_\_\_ and \_\_\_\_\_ perform a functional role, like that of insulation and double-glazing.
- \_\_\_\_\_ and \_\_\_\_\_ provide energy, just like central heating and electricity.

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### Comparison between the human body and a house

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- **[Carbohydrates]** and **[lipids]** provide energy, just like central heating and electricity.