

WARM UP

1 Translate these words into your language.

- 1 heat
- 2 kilocalorie
- 3 thermal capacity
- 4 specific heat
- 5 conductor
- 6 latent heat

## Heat transmission

Cooking makes food safe and appealing to eat and we generally do this through some form of heat transmission. It helps therefore to understand the thermal properties of different foods and materials we use in the kitchen.

**Heat** is the energy produced when the temperature of something changes and a **kilocalorie** (kcal) is the unit of measurement required to raise the temperature of a litre of water by one degree centigrade (at sea level). The heat necessary to do this is usually referred to as its thermal capacity, which varies according to the material it's made of and its weight.

The **thermal capacity** of one kilogram of any material constitutes its **specific heat**. The specific heat of fats is about a half that of water, explaining why a pan full of oil gets hot more rapidly than the same pan filled with water. The specific heat of metal is also low compared to that of water. In the case of copper, an excellent **heat conductor**, capable of transmitting heat, it is less than one tenth. Logically, the thermal capacity of any food is mainly determined by its water content, so we need more time and more kilocalories to heat a wet food than a dry one.

**Latent heat**, on the other hand, is the heat necessary to transform 1 kg of any substance. For instance, the latent heat of boiling water is about 540 kilocalories, whereas that of ice fusion is about 80 kilocalories. Both cases present quite high values, which may explain why a mixture of water and ice can be kept for a long time at 0°C and why we need so much time to make a pot of boiling water completely evaporate.

To sum up, the amount of heat needed for cooking depends on the product's composition and its weight. The required cooking time also depends on the cooking process used, so on the heat transmission method, on food material and shape.



ACTIVITIES

READING COMPREHENSION

2 Read the text again and answer these questions.

- 1 How do we cook?
- 2 When is heat produced?
- 3 What affects something's thermal capacity?
- 4 Why does a pan of oil get hot more rapidly than one of water?
- 5 Is the specific heat of metal high or low compared to water?
- 6 Which metal is an excellent heat conductor?
- 7 Which takes more time to heat: wet food or dry food?
- 8 Why can water and ice be kept at 0°C for a long time and a pot of boiling water take so much time to evaporate?
- 9 What determines the amount of heat needed for cooking?
- 10 What other factor determines cooking time?

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VOCABULARY

3 Read the text about heat transmission and write the English words in exercise 1 next to each definition.

- 1 a material or device that can transmit heat conductor
- 2 the energy produced when the temperature of something changes \_\_\_\_\_
- 3 the heat necessary to transform 1 kg of any substance \_\_\_\_\_
- 4 the heat necessary to raise the temperature of a litre of water by 1°C \_\_\_\_\_
- 5 the thermal capacity of one kilogram of any material \_\_\_\_\_
- 6 the unit of measurement required to raise the temperature of a litre of water by 1°C \_\_\_\_\_

LISTENING

4  7 Listen and complete the missing information in the table about cooking meat.

Level of 'doneness'	Meat type	Meat colour	Meat temperature
1 very rare	game and red meat	dark red with small greyish rim	45°C - 50°C
2 _____	_____	dark red core, with a red outline and a greyish rim	_____
3 _____	red meat, veal, pork and red meat poultry	_____	_____
4 _____	red meat, veal, pork and some game cuts	_____	60°C - 65°C
5 well-done	_____	_____	_____

SPEAKING

5 Work in pairs. Take it in turns to role play a trainee commis chef and a head chef shouting meat orders into the kitchen and testing the trainee chef's knowledge. Use the information in the table above and be prepared to ask some difficult questions.

- Head chef *One very rare steak!*
- Commis *Dark red with a small greyish rim cooked between 45°C and 50°C.*
- Head chef *Correct!*
- Head chef *One medium rare chicken!*
- Commis *You can only cook white poultry well-done!*
- Head chef *Correct!*