

# Food Security and Farming

**Q:1** There are many ways to increase the efficiency of food production.

**(a)** The table shows the energy available to humans from two different food chains.

Food chain	Energy transferred to humans in kJ per hectare of crop
Wheat → humans	900 000
Wheat → pigs → humans	90 000

**(a) (i)** Compare the amount of energy the two food chains transfer to humans.

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**(1 mark)**

**(a) (ii)** Give one reason for the difference in the amount of energy the two food chains transfer to humans.

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**(1 mark)**

**(b)** In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Give methods used in the factory farming of animals.

Explain the advantages and disadvantages of these methods.

Blank lined writing area consisting of 20 horizontal lines.

(6 marks)

**Q:2** The number of fish in the oceans is decreasing.

Table 4 shows information about the mass of fish caught by UK fishermen between 2002 and 2010.

**Table 4**

**Table 4**

<b>Year</b>	<b>Mass of fish caught by UK fishermen from ALL SOURCES in thousands of tonnes</b>	<b>Mass of fish caught by UK fishermen from SUSTAINABLE SOURCES in thousands of tonnes</b>	<b>Percentage of fish caught from sustainable sources</b>
<b>2002</b>	690.0	427.8	62.0
<b>2004</b>	655.0	396.6	60.5
<b>2006</b>	619.0	386.0	62.4
<b>2008</b>	589.0	436.1	74.0
<b>2010</b>	611.5	465.0	

**(a) (i)** Calculate the percentage of fish caught from sustainable sources in 2010.

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\_\_\_\_\_ %

**[2 marks]**

**(a) (ii)** Describe the pattern in Table 4 for the mass of fish caught from all sources. Suggest reasons for this pattern.

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[4 marks]

(a) (iii) Suggest why the percentage of fish caught from sustainable sources is increasing.

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[1 mark]

(b) Give two methods of maintaining fish stocks at a sustainable level.

1 \_\_\_\_\_

2 \_\_\_\_\_

[2 marks]

(c) Figure 10 shows a fish farm.



In a fish farm, large numbers of fish are grown in cages in the sea.

Why do fish in the cages grow faster than fish of the same species that are free in the sea?

You should refer to energy in your answer.

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[4 marks]

**Q:3** Read the article about sustainable cod fishing.

Every December the European Commission makes proposals for cod fishing quotas in European Union (EU) waters. These quotas take into account data obtained by scientists.

Scientists calculate what proportion of the cod stock is being caught each year. They do this by working out the numbers in each age-group of cod.

Every year the fishermen say the scientists are exaggerating the danger to the stocks in the North Sea. The scientists say the fishermen are threatening their own long-term livelihoods by ignoring their warnings of a collapse of cod populations.

The scientists say that fishermen go only to parts of the sea where there are a lot of cod, so they get the wrong idea of the number of cod in the whole area.

**(a)** The scientists and the fishermen have different opinions about the size of the cod population.

Explain why.

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**(2 marks)**

**(b)** The final decision on how many cod the fishermen are allowed to catch may not depend entirely on the data produced by the scientists.

Suggest two reasons for this.

1 \_\_\_\_\_

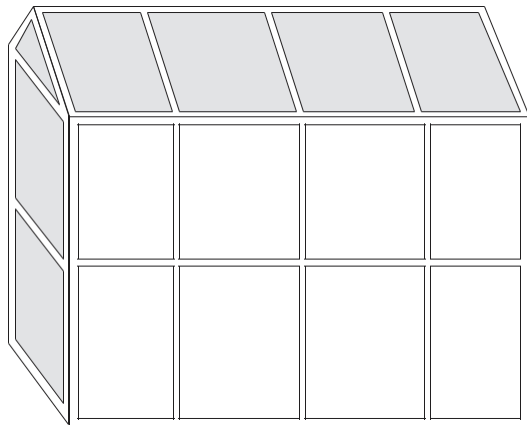
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2 \_\_\_\_\_

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**(2 marks)**

**Q:4** In this country most tomatoes are grown in greenhouses.



**(a)** Suggest one way in which a grower could increase the yield of tomatoes from plants growing in his greenhouse.

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**(1 mark)**

**(b)** Large supermarkets often import tomatoes from overseas.

**(b)(i)** Suggest two reasons why a supermarket might decide to import tomatoes rather than buy them from British growers.

1 

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**(2 marks)**

**(b)(ii)** Importing tomatoes may be more damaging to the environment than selling tomatoes grown in this country.

Explain why.

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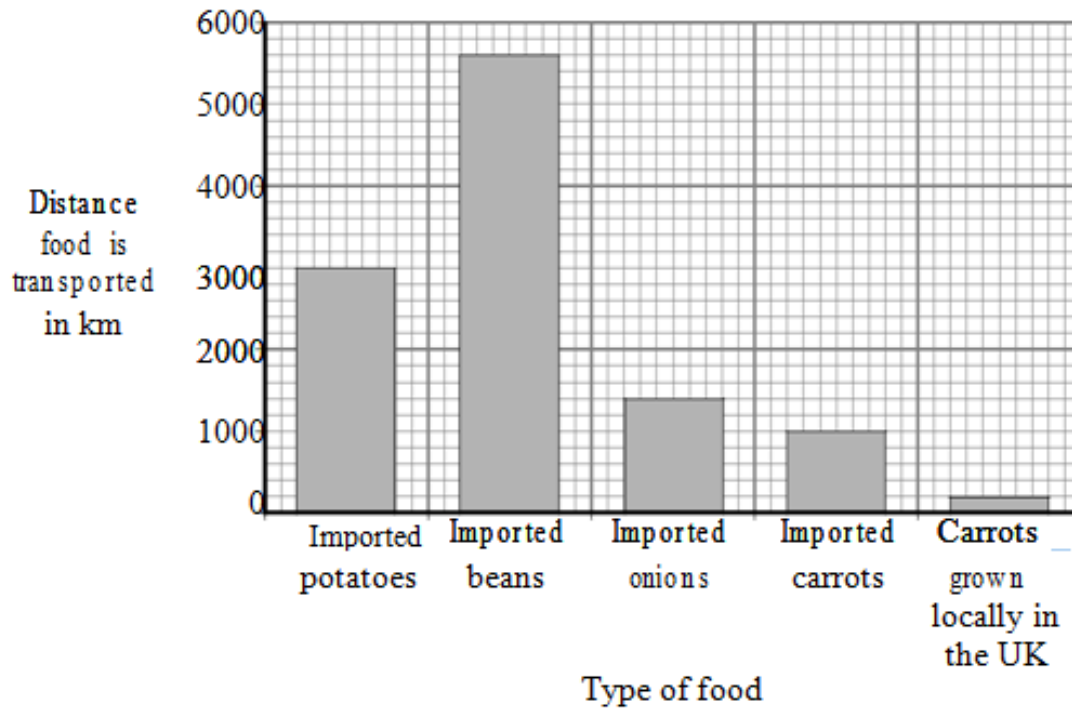
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**(2 marks)**

**Q:5** Some people are concerned about the distance that food is transported between the grower and the supermarket.

The bar chart shows the distances for some foods.



(a) Both imported carrots and carrots grown locally in the UK can be bought in supermarkets all year round.

How many times further are imported carrots transported than carrots grown locally in the UK?

Show clearly how you work out your answer.

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\_\_\_\_\_ times

(1 mark)

(b) Many of the beans sold in supermarkets in the UK are grown in Kenya, a tropical country in Africa.

Beans grow faster in Kenya than they do in the UK.

Suggest and explain one reason why.

Reason \_\_\_\_\_

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Explanation \_\_\_\_\_

\_\_\_\_\_

(2 marks)

(c) Many people believe that we should buy locally produced food instead of food imported from abroad.

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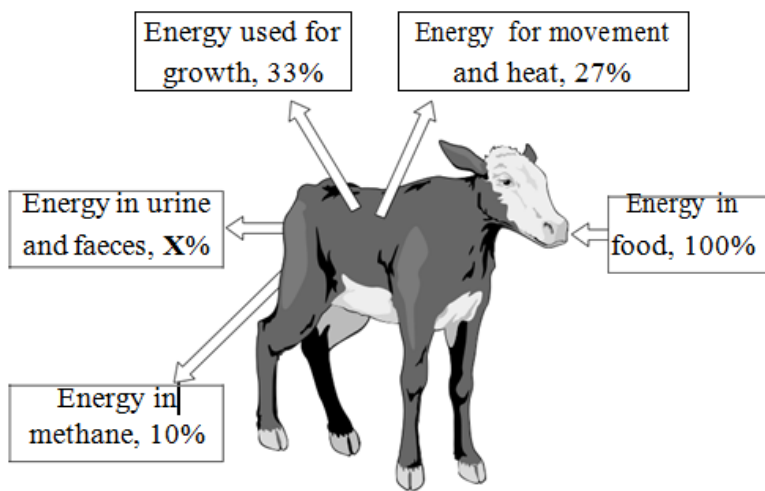
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(2 marks)

Q:6 The diagram shows what happens to the energy in the food that a calf eats.



(a) Calculate the % energy lost as urine and faeces (X). Show clearly how you work out your answer.

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Energy lost as urine and faeces \_\_\_\_\_ %

(2 marks)

(b) The energy in the food eaten by the calf in one day is 6 megajoules.

Calculate the amount of this energy that would be used for growth.

Show clearly how you work out your answer.

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Energy used for growth \_\_\_\_\_ megajoules.

(2 marks)

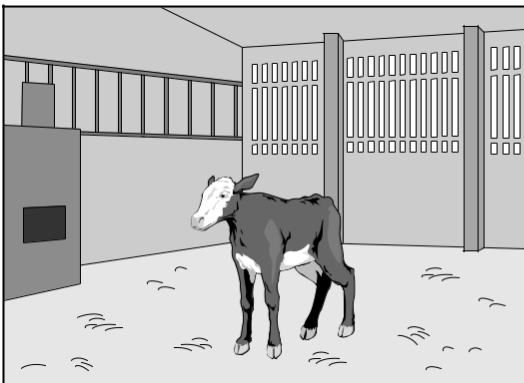
(c) Which process in the body transforms energy in food into heat?

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(1 mark)

(d) The pictures show two methods of raising calves indoors. Method 2 is now banned.

Method 1



Method 2



**(d)(i)** Calves raised indoors grow faster than calves raised outdoors.

Suggest one reason why.

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**(1 mark)**

**(d)(ii)** Method 2 was banned after public campaigns.

Suggest one reason why people campaigned against this method of rearing calves.

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**(1 mark)**

**TOTAL MARKS=42**