AQA GCSE BIOLOGY (HIGHER) · 8461

BIOLOGY



EXAM QUESTION PACK

4.7.5 FOOD PRODUCTION (PACK 2)

SCORE	PERCENTAGE
/56	%

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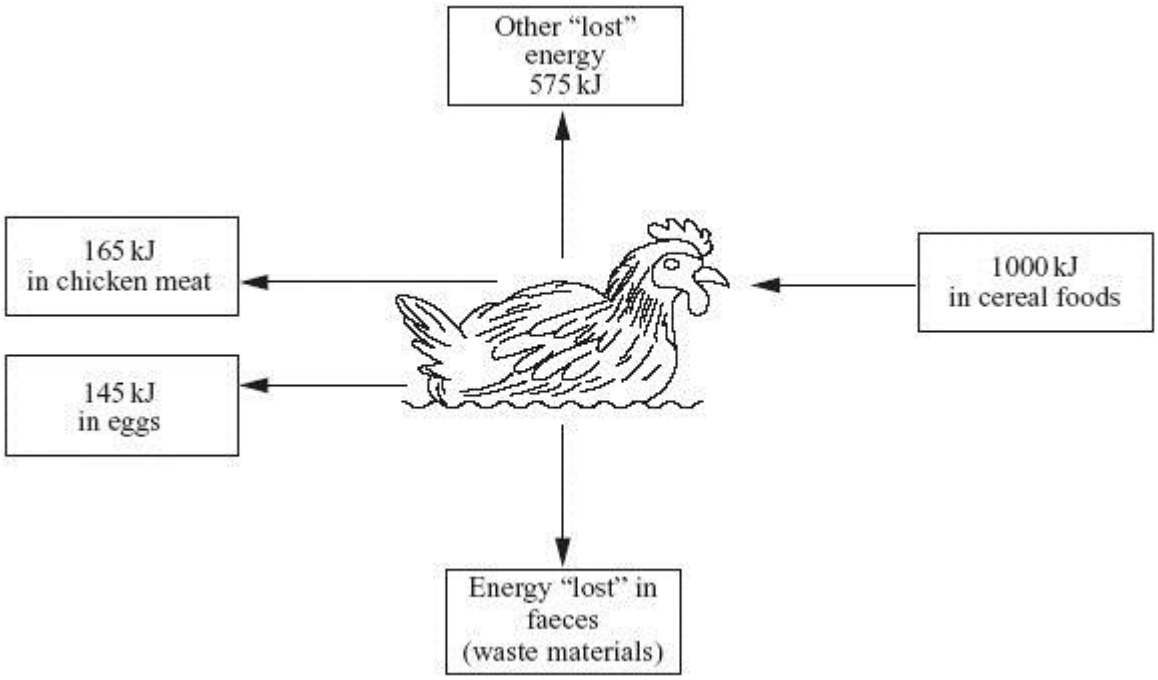
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Q1.

Chickens are kept as farm animals to produce food. Free-range chickens are allowed to feed in a large space outside. The diagram shows how energy supplied in food to a free-range chicken is transferred.



(a) Calculate the amount of energy "lost" in faeces.

_____

_____

Energy "lost" = _____ kJ

(1)

(b) Some farmers use the battery method. They keep large numbers of chickens in a small indoor space. The food yield from these chickens is higher than that from free-range chickens. Explain why, as fully as you can.

_____

_____

_____

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_____

(4)

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(Total 5 marks)

Q2.

The information in the table compares two farms. Both are the same size, on similar land, close to one another and both are equally well managed.

Name of farm	Activity	Energy value of food for humans produced in one year	Number of people whose energy requirements can be met by this food
Greenbank Farm	Grows food for humans	3285 million kJ	720
Oaktree Farm	Grows food for animals on the farm which become food for humans	365 million kJ	80

(a) Use this information to work out the average daily human energy requirement in kilojoules (kJ) per day.

_____

_____

Energy requirement = _____ kJ/day

(2)

(b) The figures show that farms like Greenbank Farm can be nine times more efficient at meeting human food energy requirements than farms such as Oaktree Farm.

(i) The food chain for Greenbank Farm is:

vegetation → humans

What is the food chain for Oaktree Farm?

_____

(1)

(ii) Explain why Greenbank Farm is much more efficient at meeting human food energy requirements.

_____

_____

_____

_____

_____

(3)

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(c) The human population has been increasing rapidly throughout this century. It is now about 6 billion and is still growing. What does the information in this question suggest about likely changes in the human diet which may need to occur during the coming century? Explain your answer.

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(4)

(Total 10 marks)

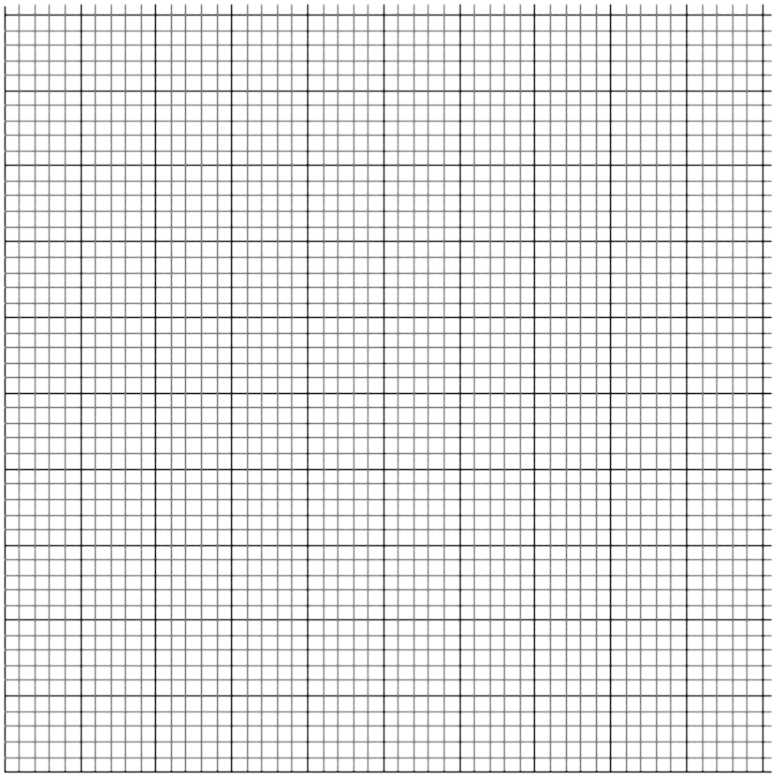
Q3.

The figures below show how the yield of a wheat crop is affected by adding nitrogen fertiliser.

Nitrogen fertiliser added (kg/hectare)	Yield (tonnes/hectare)
0	26
50	28
75	31
100	34
125	40
150	43
175	44
200	44

(a) Display these results on the graph paper in the most suitable way.

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(4)

(b) What conclusions can you draw from the graph?

_____

_____

_____

_____

_____

(3)

(Total 7 marks)

Q4.

(a) 1m² of a field gets about 1050MJ of light energy per year.

Only 21 500kJ of energy is stored in the new grass.

(i) How is the energy stored in the new grass?

_____

(1)

(ii) What is the % of light energy stored in the grass?

_____

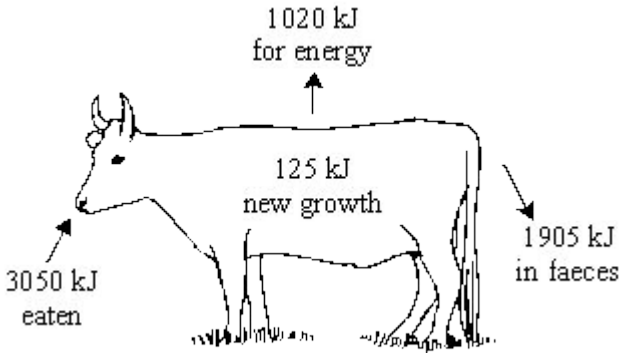
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(1)

(b)



The diagram shows what happens to the energy from grass in part of a field which is grazed by a bullock.

Using information in the diagram suggest why food chains are usually short.

_____

_____

_____

_____

_____

(3)

(c) Many of the animals which from part of our diet are herbivores rather than carnivores. Explain why as fully as you can.

_____

_____

_____

_____

_____

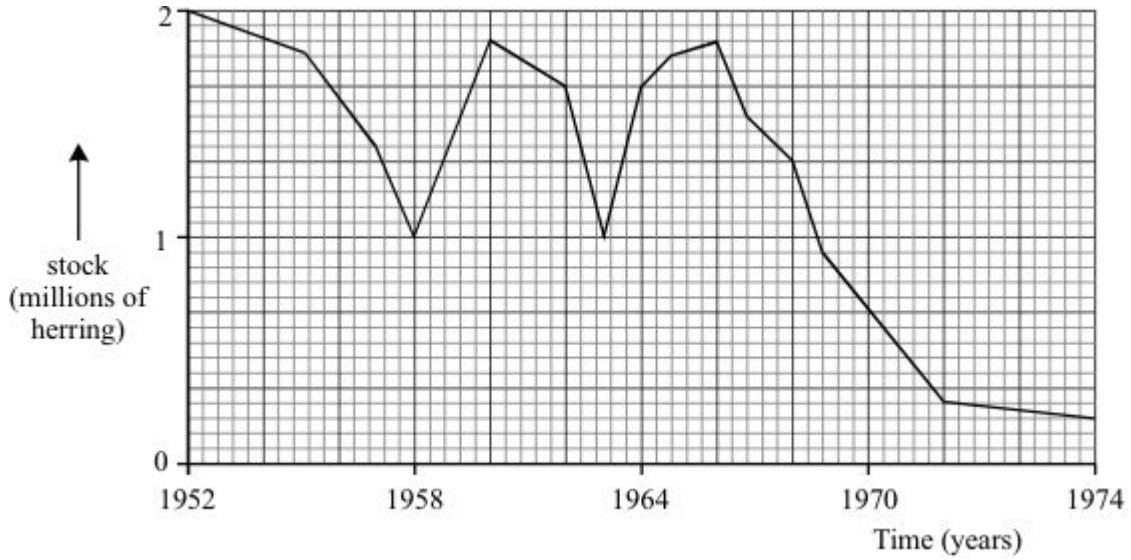
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(3)

(Total 8 marks)

Q5.

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The graph shows the variations in the North Sea herring population between 1952 and 1974. These fish were formerly caught in large numbers by fleets of trawlers but fishing has been restricted since 1974 as a conservation measure. Herrings lay about 20 000 eggs per year but do not reproduce until they are about 3–5 years old, when they are about 25cm long. It takes 11 years for a herring to reach its mature adult length.

The following measures have been suggested to prevent overfishing:

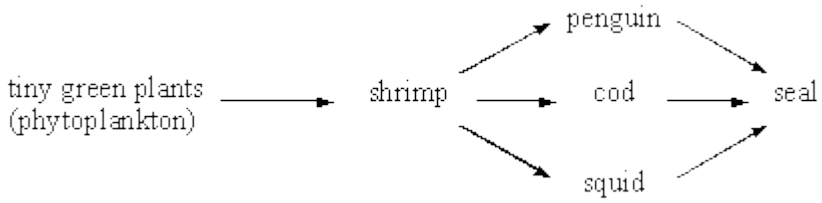
- limiting mesh size of nets,
- specifying maximum catch by each boat per year.
- prohibiting fishing in herring breeding grounds.
- prohibiting fishing at certain times of the year.

Evaluate their probable effects on both fish stocks and the fishermen, using the information given above.

(Total 9 marks)

Q6.

Scientists have found the following food web in the cold Antarctic Ocean.



(a) Humans are removing large numbers of the cod.

Some scientists argue that this could lead to a decrease in the numbers of squid and penguins.

Others argue that the numbers of squid and penguins will stay the same.

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Carefully explain each argument.

Why they might decrease.

_____

_____

_____

(1)

Why they might stay the same.

_____

_____

_____

(2)

(b) The following information is about the biomass of the organisms in one of the food chains in the web.

tiny green plants	→	shrimp	→	cod	→	seal
1000 tonnes		100 tonnes		10 tonnes		0.5 tonne

Draw and label a pyramid of biomass for this chain.

(2)

(c) Explain, as fully as you can, why the conversion of shrimp biomass into cod biomass is more efficient than that of cod biomass into seal biomass in the cold Antarctic Ocean.

_____

_____

_____

_____

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(3)

(d) Boats from many countries fish the Antarctic Ocean. The cod are being overfished. If the numbers of cod are to increase, the population must be carefully managed.

(i) Suggest **two** control measures which would prevent a further drop in numbers,

_____

_____

(2)

(ii) Suggest why **one** of your control measures would be difficult to put into practice.

_____

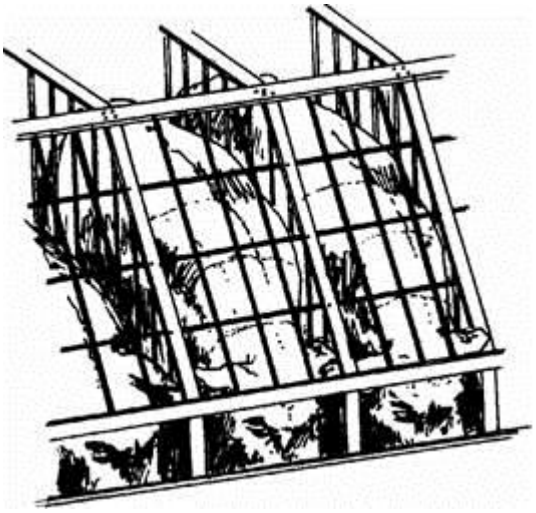
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(1)

(Total 11 marks)

Q7.

To produce cheap meat, animals must be grown (reared) efficiently. When pigs are reared intensively they are kept indoors. Their surroundings are closely monitored to make sure they have even ventilation and the correct temperature. The risk of infection is high but is reduced by feeding them antibiotics and removing their faeces. The pigs live in cages and cannot move around much.



(a) Explain why farmers control the temperature.

_____

_____

_____

(2)

(b) Explain why farmers want to stop the pigs moving about.

_____

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_____

_____

(2)

(c) Give two arguments **against** rearing pigs indoors instead of rearing them outdoors.

1. _____

2. _____

(2)

(Total 6 marks)

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