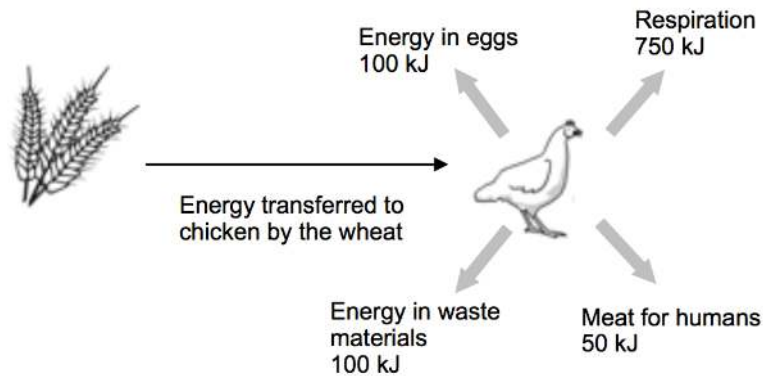


0	1
---	---

The diagram shows the transfer of energy in a simple food chain.



0	1	.	1
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Calculate the following:

The energy transferred to the chicken by the wheat.

$$100 + 50 + 750 + 100 [1]$$

Energy = 1000 [2] kJ [2 marks]

The energy transferred to the humans in food

$$100 (\text{eggs}) + 50 (\text{meat})$$

Energy = 150 [2] kJ [2 marks]

**DON'T FORGET:**

**WARNING :** As always, show working, even though you often get full marks for writing the correct answer.

0	1	.	2
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Suggest why all the energy in wheat may not be transferred to chickens.

Used by wheat in respiration or not all the wheat is eaten [1]

0	1	.	3
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In the example above the chicken lives in a pen (space with a fence around it)

which has an area of 25 m<sup>2</sup>. Chickens are sometimes kept in indoor cages that restrict movement. Evaluate the method of growing chickens in indoor cages that restrict movement. [3 marks]

advantages

Quicker or faster growth [1 mark]

because less energy used for movement [1 mark]

Less (of the chicken's chemical) energy used for keeping warm [1 mark]

Less money spent on food for chickens [1 mark]

Disadvantages less ethical or worse animal welfare ignore more natural [1 mark] Worse flavour / quality (of meat) [1 mark]

More pollution / more fossil fuel used for heating the enclosure [1 mark]

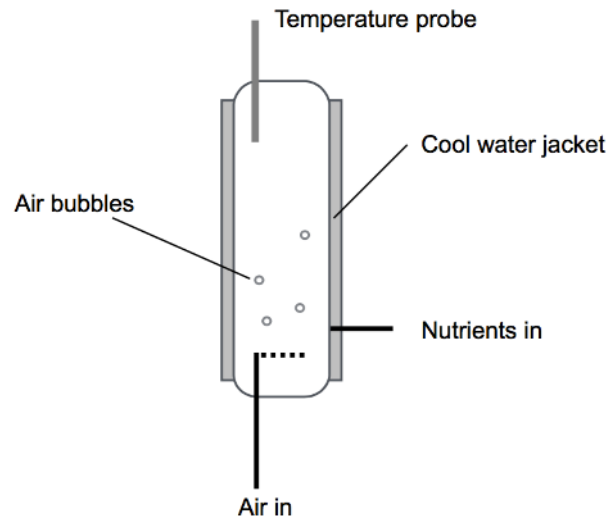
[Remember to give your overall opinion]

**WARNING :** you won't get marks for ideas referring to 'against God's will' or 'quality of life'. Mentioning organic or free range won't get the marks in this question.

0	2	.	1
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Mycoprotein is a food source produced from a type of fungus called *Fusarium*. It can be grown in fermenter.

The diagram shows a representation of some parts of the mycoprotein fermenter.



Describe how *Fusarium* is grown in the fermenter to make sustainable food

**[5 marks]**

*Fusarium* fungus in the fermentor [1]

feed off glucose syrup (from waste starch) [1]

oxygen pumped in [1]

for aerobic respiration [1]

motor/paddle mixes oxygen into the fermentor [1]

optimal temperature maintained by water jacket [1]

fungus biomass extracted/harvested/purified [1]

to make Mycoprotein [1]

which is a nutrient/energy rich food [1]

that reduces links in food chains/is cheap/sustainable/quick to produce [1]