

LUI

School code

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Book

of

books used

External assessment 2022

Question and response book

Agricultural Science

Paper 2

Time allowed

- Perusal time — 10 minutes
- Working time — 90 minutes

General instructions

- Answer all questions in the question and response book.
- Type responses in text fields.
- QCAA-approved calculator permitted.
- Planning paper will not be marked.

Section 1 (34 marks)

- 8 short response questions

Section 2 (17 marks)

- 1 extended response question





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Section 1

Instructions

- If you need more space for a response, use the additional pages at the back of this book.
 - On the additional pages, type the question number you are responding to.
 - Type the page number of your alternative/additional response, i.e. See page ...
 - If you do not do this, your original response will be marked.
 - This section has eight questions and is worth 34 marks.
-

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QUESTION 1 (4 marks)

White spot disease (WSD) is caused by a highly contagious viral infection that affects crustaceans such as prawns, lobsters and crabs. The virus that causes WSD poses no risk to food safety or human health but when found in high production areas, like prawn farms, it causes rapid animal death.

WSD is spread by the movement of infected animals or contaminated water. Birds that feed on infected animals and move to another location can readily spread the disease. Fin fish do not carry the disease and are not affected by it.

WSD was first identified in prawn farms and following a 4-year extensive eradication and monitoring program, was no longer detected in the local environment.

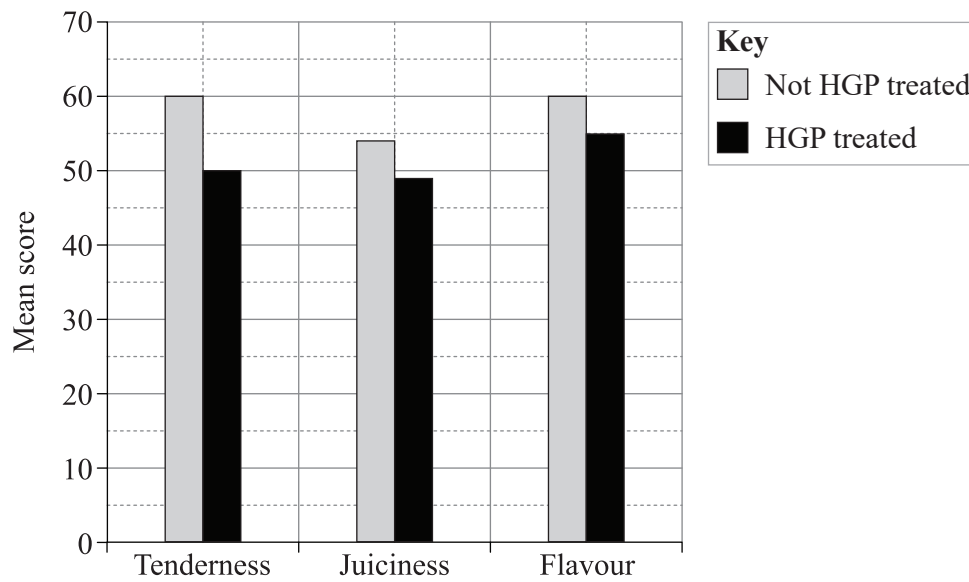
Explain two strategies that could be implemented to reduce the incidence of WSD if it is detected again.

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QUESTION 2 (4 marks)

a) Explain why beef producers choose to use hormone growth promotants (HGPs). [2 marks]

The graph shows the effects of HGPs on three aspects of meat quality in cattle.

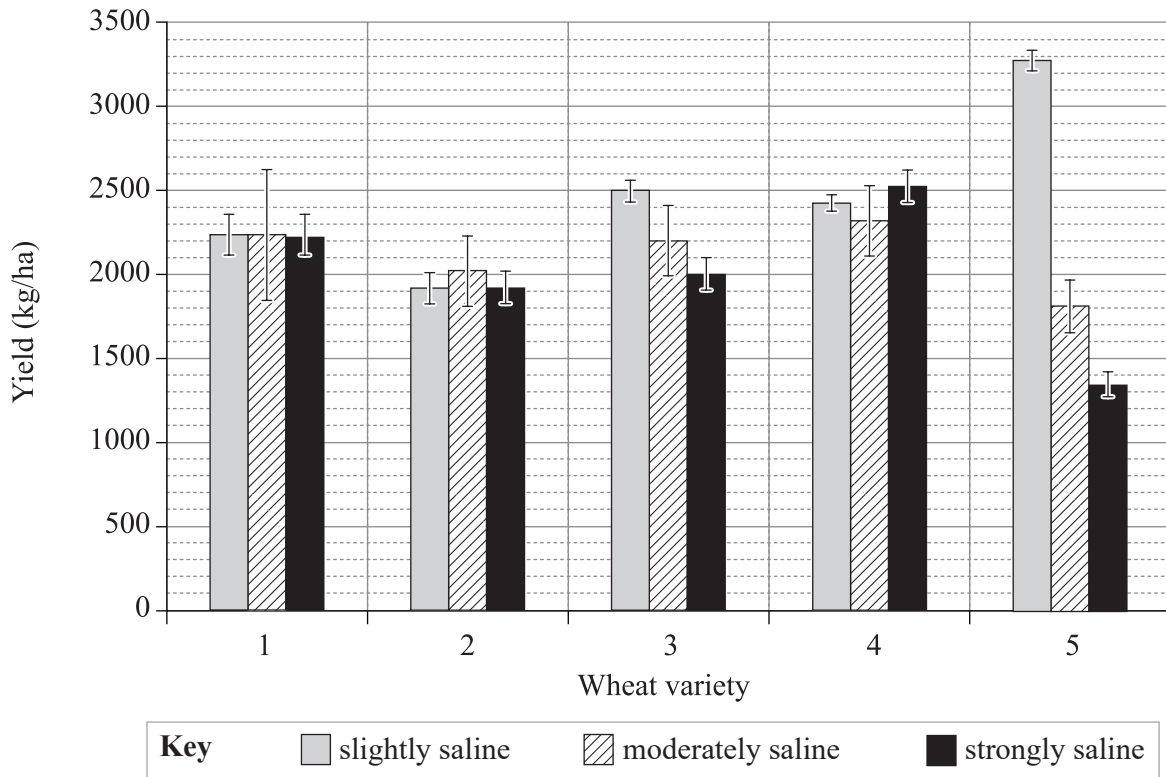


b) Draw a conclusion about the overall effect of HGPs on meat quality. Justify your conclusion using evidence from the graph. [2 marks]

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QUESTION 3 (4 marks)

The graph shows the yield of five wheat varieties grown under differing levels of salinity. Bars represent 3-year mean grain yield values along with standard error.



a) Contrast the levels of uncertainty in the data collected from moderately and strongly saline soils. Show your reasoning using evidence from the graph.

[2 marks]

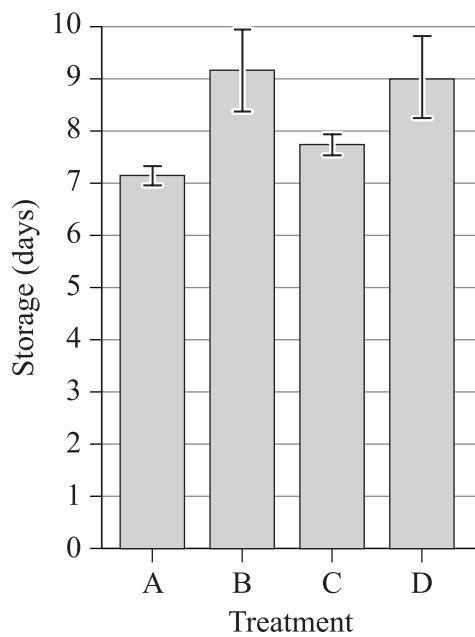
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b) Infer whether variety 1 is the best option to plant in strongly saline soils. Justify your answer using evidence from the graph. *[2 marks]*

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QUESTION 4 (5 marks)

The graph shows the effect of different preservative treatments on the shelf life of radish.



Treatment A	Control
Treatment B	0.6% calcium nitrate
Treatment C	0.6% humic acid
Treatment D	0.6% calcium nitrate and 0.6% humic acid

a) Identify differences between each of the treatments used.

[3 marks]

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b) Identify a negative effect of using preservatives on radish crops, and explain the potential effect on consumer satisfaction.

[2 marks]

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QUESTION 5 (3 marks)

Some egg producers use battery or caged chickens to produce eggs.

a) Identify an ethical issue with this type of production.

[1 mark]

b) Identify a welfare issue with this type of production.

[1 mark]

c) Explain the difference between ethical and welfare issues.

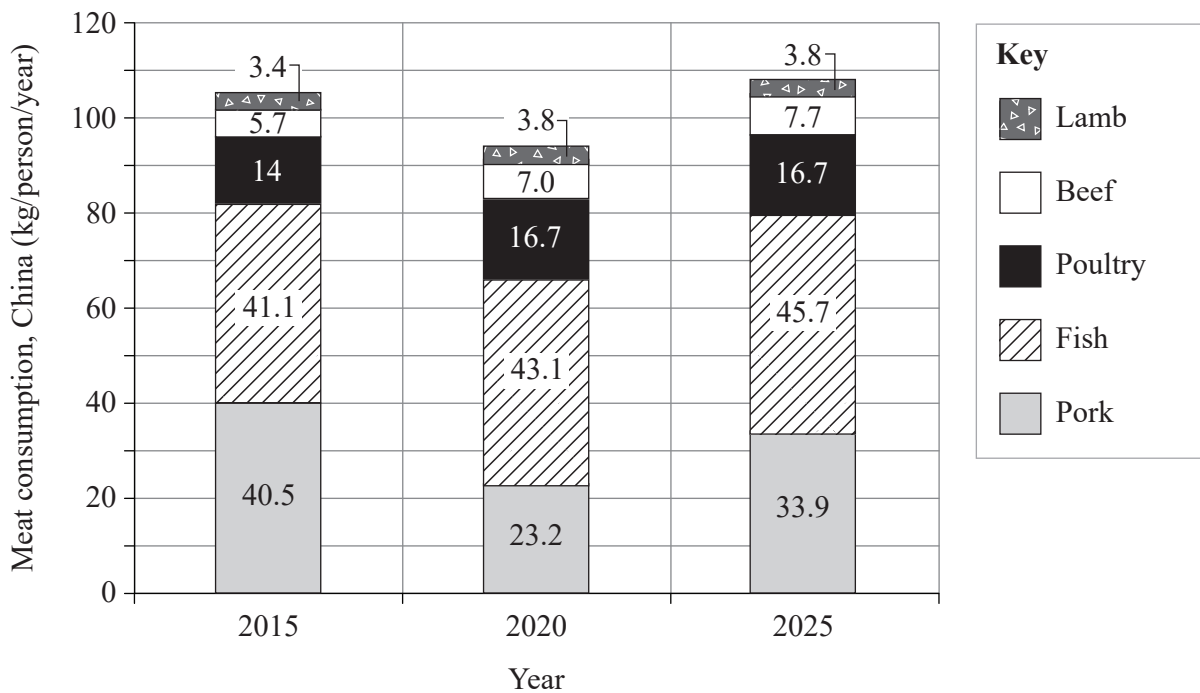
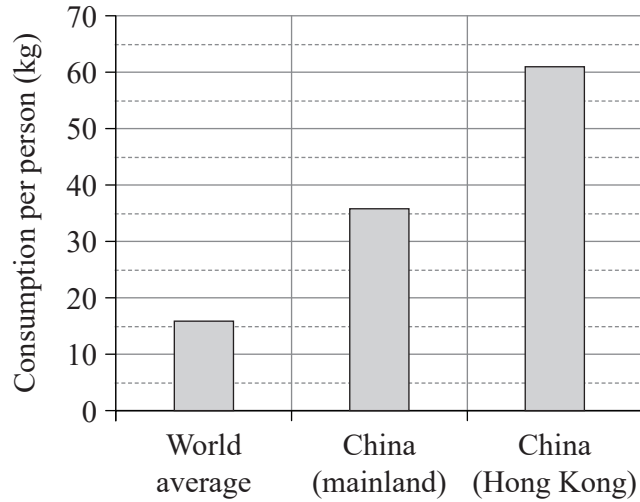
[1 mark]

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QUESTION 7 (7 marks)

African swine fever (ASF) has had an impact on animal production in countries where it is prevalent. In 2019, 10% of the total pig population in China, an estimated 44 million pigs, died of ASF.

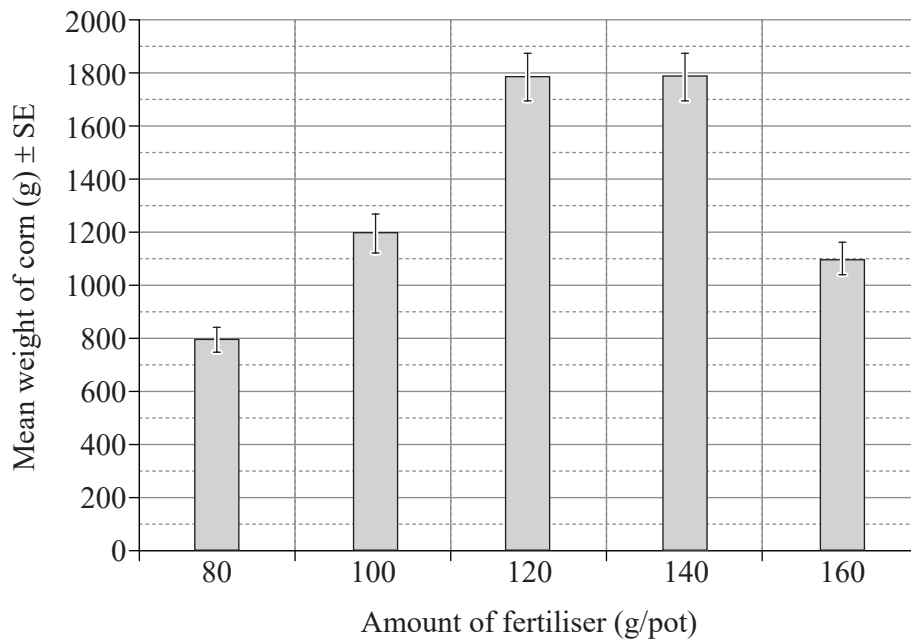
The first graph shows pork consumption per person in various countries, and the second graph shows current and projected levels of pork consumption per person compared to other animal protein sources in China.



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QUESTION 8 (3 marks)

A plant trial was conducted to assess the effect of different amounts of fertiliser on the mean weight of corn produced.



Identify the relationships shown between the amount of fertiliser and mean weight of corn produced.

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Section 2

Instructions

- Select **one** question.
- Indicate the question you have selected by filling in the bubble on the next page completely.
- If you change your mind or make a mistake, draw a cross through the bubble you wish to change and fill in the new bubble completely.

Example:

Question 9 <input checked="" type="radio"/>	Question 10 <input type="radio"/>
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- This section has one question and is worth 17 marks.
- Respond in 300–350 words.

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Fill in the bubble to indicate the question you have selected.

Question 9 <input type="radio"/>	Question 10 <input type="radio"/>
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QUESTION 9 (17 marks)

An extensive cattle grazing property in northern Queensland focuses on breeding and backgrounding Brahman and Brahman cross animals for domestic and live export markets. Breeder numbers have declined in recent years due to drought.

The property is 45 000 hectares and has an average annual rainfall of 495 mm.

The current workforce consists of a property manager, a head stockperson and eight recent school leavers working as jackaroos and jillaroos. Contract helicopter pilots are employed twice a year to help with mustering.

An anticipated risk to this Australian agricultural enterprise is drought. Identify one other anticipated risk. For each risk, use the PPRR (Prevention, Preparedness, Response, Recovery) model to describe a risk management strategy for each element of the model. Justify the risk management strategy for each element.

OR

QUESTION 10 (17 marks)

A citrus orchard in Queensland grows Imperial mandarins for the domestic market and Honey Murcott mandarins for the export market. They also have a small number of other citrus trees and sell the fruit through a driveway stall and the local supermarket.

The property occupies an undulating sloped area of 100 hectares and has an average annual rainfall of 870 mm.

Less than half of the property is currently used for producing citrus and the remainder is unused, including some river flats and hillier country. Citrus production on this property has been affected by an outbreak of citrus canker in the past.

The orchard's workforce comprises two owners who live and work full-time at the property, and one full-time employee. They require additional seasonal labour to assist at harvest times.

An anticipated risk to this Australian agricultural enterprise is cyclones. Identify one other anticipated risk. For each risk, use the PPRR (Prevention, Preparedness, Response, Recovery) model to describe a risk management strategy for each element of the model. Justify the risk management strategy for each element.

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References

Question 2

Data sourced from

Australian Brahman Breeders' Association 2009, 'Hormonal Growth Promotants and Meat Quality', *Brahman News*, vol. 164, Figure 2, Consumer panel scores for LD muscle, www.brahman.com.au/technical_information/meatScience/hormonalGrowth.html.

Question 3

Data sourced from

Figure 1 in Qadir, M, Tubeileh, A, Javaid, A & Khan, MA 2008, 'Productivity enhancement of salt-affected environments through crop diversification', *Land Degradation and Development*, vol. 19, no. 4, pp. 429–453, www.researchgate.net/figure/Field-scale-evaluation-of-salt-tolerant-wheat-varieties-SARC-1-SARC-2-SARC-3-and_fig1_227602864.

Question 4

Data sourced from

Figure 3 in Gonzales, LMN & Quevedo, MA 2017, 'Respiration rate and shelf life of radish (*Raphanus sativus* L.) as influenced by postharvest application of calcium nitrate and humic acid concentration', *Mindanao Journal of Science and Technology*, vol. 15, pp. 76–88, www.researchgate.net/publication/323445814_Respiration_Rate_and_Shelf_Life_of_Radish_Raphanus_sativus_L_as_Influenced_by_Postharvest_Application_of_Calcium_Nitrate_and_Humic_Acid_Concentration.

Question 7

Data and information derived from

Gaudreault, NN et al. 2020, 'African Swine Fever Virus: An emerging DNA arbovirus', *Frontiers in Veterinary Science*, vol. 7, 13 May, p. 215, www.frontiersin.org/articles/10.3389/fvets.2020.00215/full.

Wang, X 2019, 'Swine fever may affect pork for several years', *China Daily*, 11 September, <http://global.chinadaily.com.cn/a/201909/11/WS5d784d0da310cf3e3556aea3.html>.

Graph 'China meat consumption per capita consumption — outlook' in *Meat & Livestock Australia 2021*, 'ASF continues to wreak havoc across Asia', *MLA*, 22 April, www.mla.com.au/prices-markets/market-news/2021/asf-continues-to-wreak-havoc-across-asia.

Figure 4 in Food and Agriculture Organization of the United Nations 2017, 'African Swine Fever threatens People's Republic of China (6 March 2018)', *FAO Animal Health Risk Analysis – Assessment*, vol. 5, www.fao.org/3/i8805en/i8805en.pdf



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