External assessment 2024

**Multiple choice question book**

# Agricultural Science

## Paper 1

**General instruction**

- Work in this book will not be marked.

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

# Section 1

## Instruction

- Respond to these questions in the question and response book.

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## QUESTION 1

When using the PPRR model, restocking after a drought is an example of

(A) preparedness.

(B) prevention.

(C) response.

(D) recovery.

## QUESTION 2

The table shows the export of Australian beef products to China from 2015 to 2018.

| | Export (tonnes) | | | |
|---|---|---|---|---|
| | **2015** | **2016** | **2017** | **2018** |
| **Grain-fed chilled beef** | 10 391 | 18 674 | 20 210 | 15 980 |
| **Grain-fed frozen beef** | 22 910 | 33 412 | 45 678 | 35 267 |
| **Grass-fed chilled beef** | 4598 | 5568 | 4320 | 5120 |
| **Grass-fed frozen beef** | 55 632 | 56 452 | 70 563 | 77 563 |

What may have caused the change in grain-fed beef exports between 2017 and 2018?

(A) increasing competition from grain-fed beef exports from the United States

(B) flooding of the Chinese market with grass-fed beef from Chile

(C) decreasing volume of grain-fed beef imported from Argentina

(D) ceasing the China–Australia Free Trade Agreement in 2017

## QUESTION 3

The table shows the total crop water use (rainfall + irrigation) over three years for four neighbouring farms growing the same crop.

| | Total crop water use (ML/ha) | | | |
|---|---|---|---|---|
| | **Farm 1** | **Farm 2** | **Farm 3** | **Farm 4** |
| **2020** | 14.9 | 12.8 | 15.1 | 13.5 |
| **2021** | 13.5 | 14.1 | 13.5 | 14.4 |
| **2022** | 10.1 | 13.2 | 12.3 | 12.2 |

Which farm had the most efficient water use?

(A) Farm 1

(B) Farm 2

(C) Farm 3

(D) Farm 4

## QUESTION 4

Most carbohydrate absorption in monogastric animals occurs in the

(A) caecum.

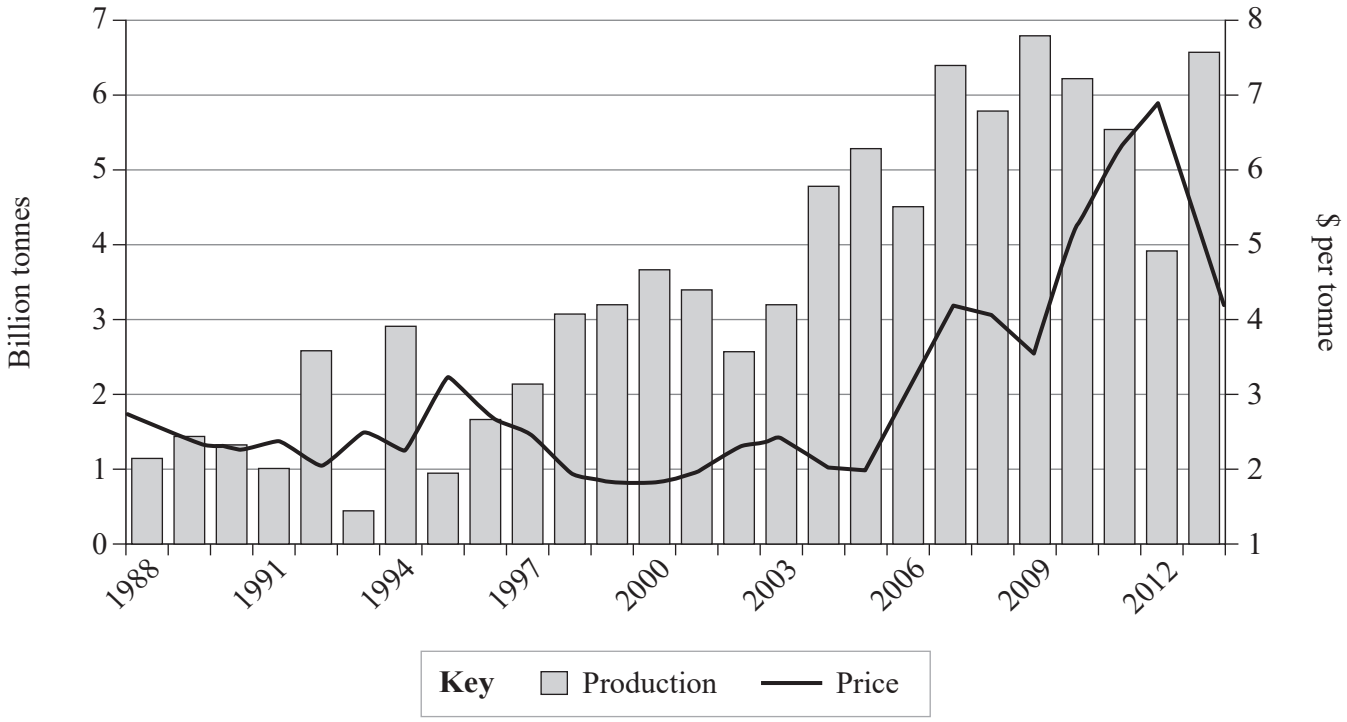
(B) stomach.

(C) large intestine.

(D) small intestine.

## QUESTION 5

The graph shows the total production and price of corn in a country from 1988 to 2013.




Identify the trend that can be supported by the data in the graph.

(A) an increase in production between 2007 and 2010

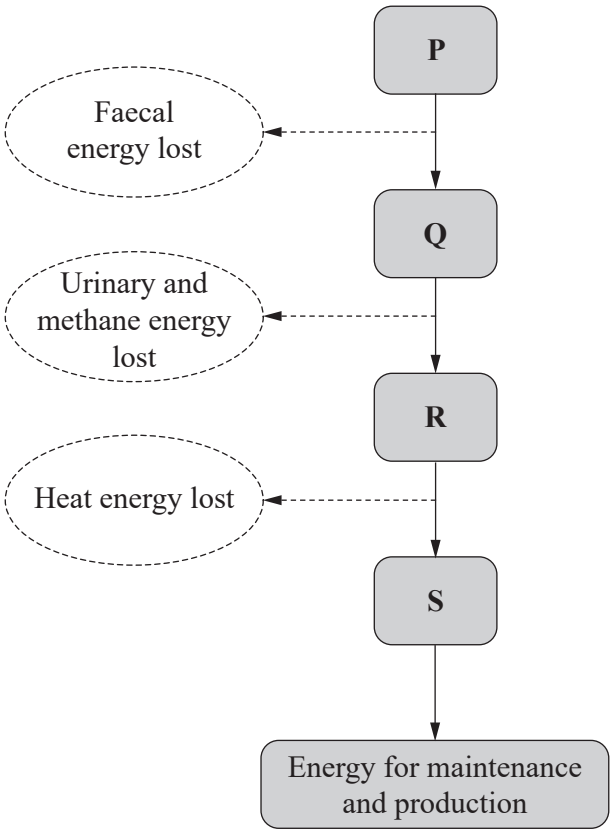
(B) a decrease in production between 1995 and 1997

(C) an increase in price between 2005 and 2007

(D) a decrease in price between 2009 and 2011

## QUESTION 6

The diagram shows the flow of energy available from food in ruminant animals.




Identify the type of energy found at Q.

(A) net

(B) gross

(C) digestible

(D) metabolisable

## QUESTION 7

Grafting in horticulture is

(A) growing plant tissue on a cultured medium.

(B) planting a piece of source plant material.

(C) cross-pollinating unrelated plants.

(D) joining plant tissues together.

## QUESTION 8

The table shows an excerpt from a partial budget for a sheep producer who is considering converting their enterprise from a prime lamb flock to a dual-purpose flock.

| | $ |
|---|---|
| **Gains** | |
| Wool sales | 10 999 |
| Variable inputs for grain | 5878 |
| Gains | 16 877 |
| **Losses** | |
| Shearing | 3495 |
| Prime lamb sales | 6812 |
| Losses | 10 307 |
| **Net change** | **6570** |

Which conclusion is supported by the data in the table?

(A) Additional costs would be smaller if changing enterprises.

(B) The producer should continue having only a prime lamb flock.

(C) Revenue would increase if the producer converted to a dual-purpose flock.

(D) Overall profit would decrease if the producer converted to a dual-purpose flock.

## QUESTION 9

An excerpt from a financial statement for a wheat crop grown on 500 ha is shown.

| | $/ha |
|---|---|
| **Income/ha** | 704 |
| Wheat (3.2 t/ha at $220/t) | 704 |
| **Total income ($/ha)** | |
| **Costs/ha** | |
| Sowing | 58 |
| Permanent wages | 40 |
| Rates | 18 |
| Fertiliser | 210 |
| Herbicide | 42 |
| Insecticide | 12 |
| Contractors | 110 |
| Fuel | 18 |
| **Total variable cost ($/ha)** | |
| **Total cost ($/ha)** | |
| **Gross margin ($/ha)** | |

Determine the *total variable cost* and *gross margin* for the crop.

| | Total variable cost ($/ha) | Gross margin ($/ha) |
|---|---|---|
| (A) | 508 | 196 |
| (B) | 468 | 236 |
| (C) | 450 | 254 |
| (D) | 472 | 232 |

## QUESTION 10

Legume crops require microorganisms for the development of root nodules to improve

(A) grain fill.

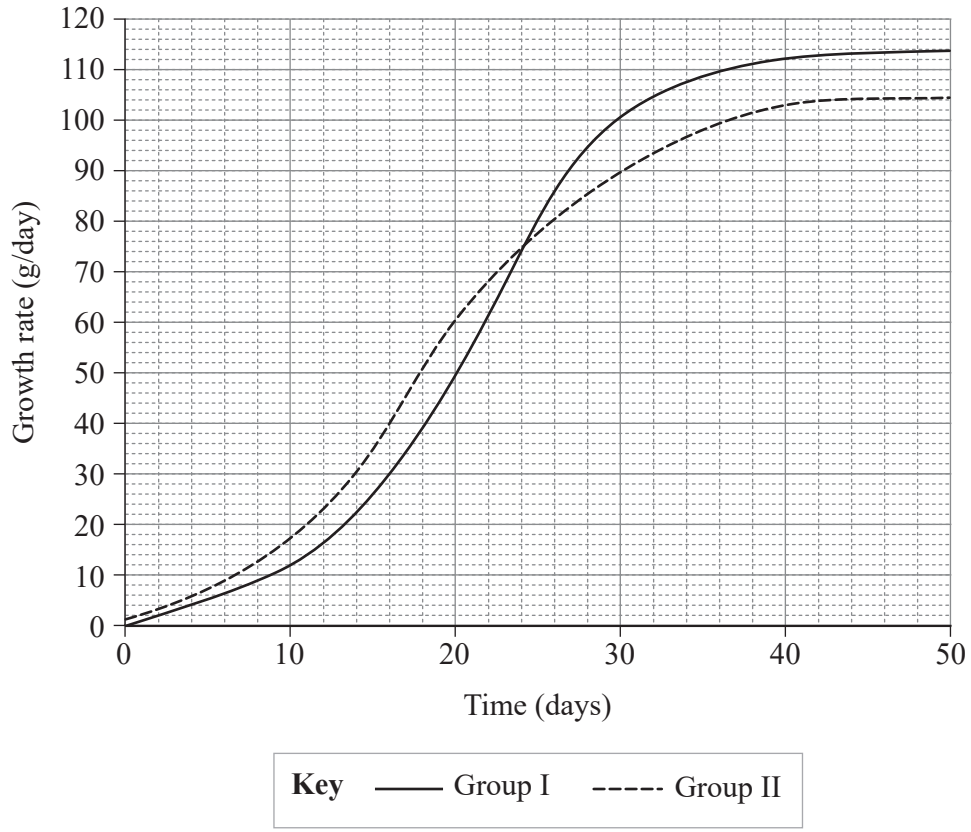
(B) nitrogen fixation.

(C) root development.

(D) carbon sequestration.

## QUESTION 11

The graph shows the growth rate of two groups of the same breed of meat chicken.




Identify when the meat chickens in Group I had a faster increase in growth rate in contrast to Group II.

(A) 0–20 days

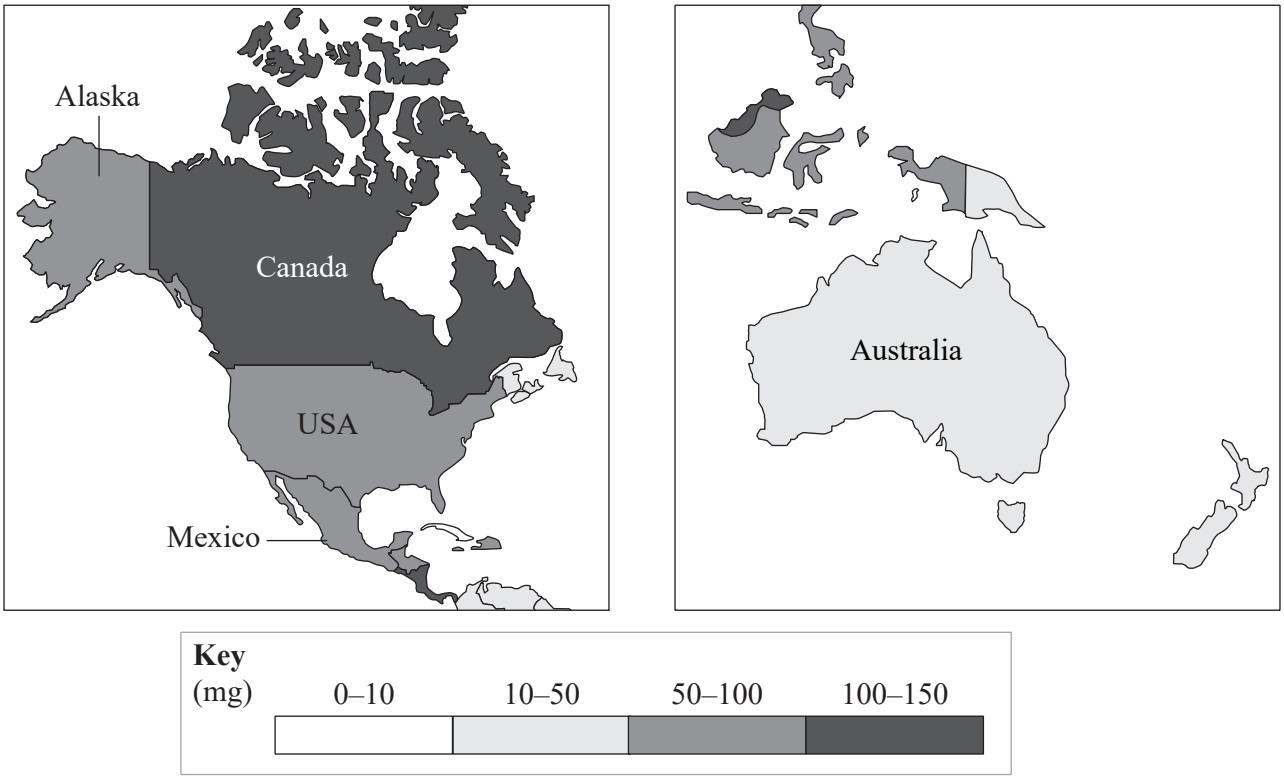
(B) 20–30 days

(C) 30–34 days

(D) 34–40 days

## QUESTION 12

The diagram shows the level of antibiotic use (mg/kg meat) in animal production in certain countries.




Which statement is supported by the diagram?

(A) Alaska has the highest use of antibiotics in animal production.

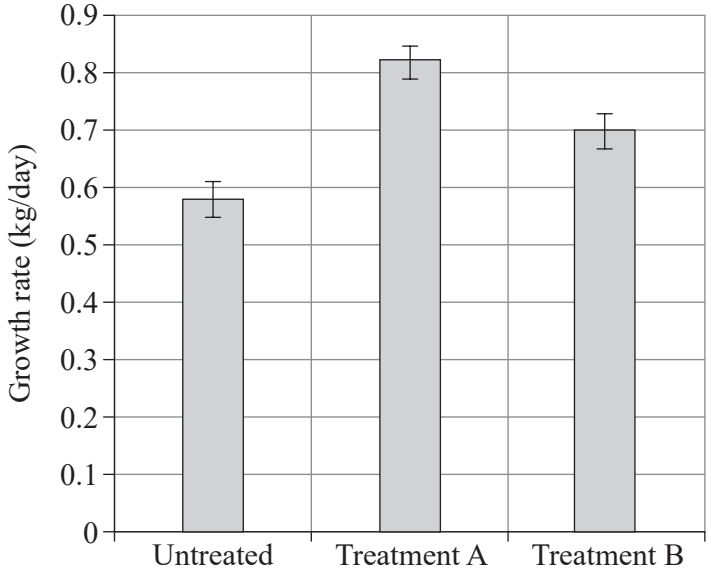
(B) Australia uses 0–10 milligrams of antibiotics per kilogram of meat produced.

(C) Canada uses 50–100 milligrams of antibiotics per kilogram of meat produced.

(D) Australia uses less antibiotics per kilogram of meat produced than Canada, Mexico or the USA.

## QUESTION 13

The graph shows the effect of treatment for buffalo fly on calf growth rate prior to weaning. The graph includes standard error bars.




Which statement is supported by the graph?

(A) Growth rate will increase by 0.24 kg/day if treatment A is used.

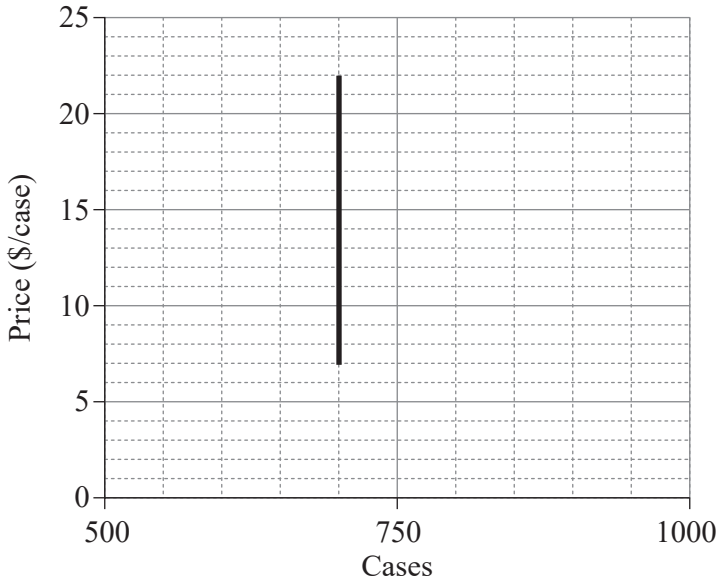
(B) Untreated calves will likely have a greater incidence of buffalo fly.

(C) Cows will produce more milk for calves if they are treated for buffalo fly.

(D) The effects of treatments A and B on growth rate are not statistically different.

## QUESTION 14

The graph shows the price ($/case) received by producers for the quantity of a product sold at market.




The graph is an example of which type of demand–supply relationship?

(A) inelastic demand, inelastic supply

(B) inelastic demand, elastic supply

(C) elastic demand, inelastic supply

(D) elastic demand, elastic supply

## QUESTION 15

What is an outcome of adopting minimum tillage practices for plant production?

(A) increased erosion

(B) increased soil moisture

(C) reduced infiltration rates

(D) reduced soil organic matter

# References


**Question 2**

Data sourced from Figure 3, Duver, A & Qin, S 2020, *Stocktake of Free Trade, Competitiveness and a Global World: How trade agreements are shaping agriculture*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, available at https://doi.org/10.25814/5f55d51ad980d. CC by 4.0

**Question 5**

Graph adapted from Childs, D 2013, 'Supply and demand influence corn prices', *AG News and Views*, Noble Research Institute.

**Question 8**

Australian Wool Innovation & Meat and Livestock Australia 2008, 'Cost of production calculator for sheep enterprises', *Making More from Sheep*, https://www.makingmorefromsheep.com.au/manual/module-1-plan-for-success/tool-1-9-mmfs-cost-of-production/.

**Question 9**

Table adapted from Grains Research and Development Corporation 2013, *Cost of Production*, fact sheet, GRDC, Canberra, https://grdc.com.au/resources-and-publications/all-publications/factsheets/2013/11/cost-of-production (archived).

**Question 12**

Figure adapted from Mulchandani et al. 2023 (dataset), processed by Our World in Data, *Antibiotic Usage in Livestock, 2020*, Oxford Martin School, Oxford, UK, https://ourworldindata.org/grapher/antibiotic-usage-in-livestock. Licensed CC BY.