



Western Australian Certificate of Education Examination, 2013

Question/Answer Booklet

ANIMAL PRODUCTION SYSTEMS

Stage 3

Please place your student identification label in this box

Student Number: In figures

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In words

Time allowed for this paper

Reading time before commencing work: ten minutes

Working time for paper: three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet

Multiple-choice Answer Sheet

Number of additional
answer booklets used
(if applicable):

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener,
correction fluid/tape, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in the WACE examinations

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of exam
Section One: Multiple-choice	15	15	20	15	15
Section Two: Short answer	8	8	90	111	50
Section Three: Production practices	1	1	30	28	15
Section Four: Extended answer	3	2	40	40	20
Total					100

Instructions to candidates

- The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2013*. Sitting this examination implies that you agree to abide by these rules.
- Answer the questions according to the following instructions.

Section One: Answer **all** questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Sections Two, Three and Four: Write your answers in this Question/Answer Booklet.

- You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.
- Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
 - Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
 - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

See next page

Section One: Multiple-choice

15% (15 Marks)

This section has **15** questions. Answer **all** questions on the separate Multiple-choice Answer Sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Suggested working time: 20 minutes.

1. Rumen micro-organisms break down food proteins into peptides and
 - (a) propionic acids.
 - (b) amino acids.
 - (c) butyric acids.
 - (d) acetic acids.

2. On which document must you declare that your livestock have **not** been fed restrictive feeds prior to them leaving your property?
 - (a) Livestock waybill
 - (b) National Livestock Information System (NLIS) transfer
 - (c) National Vendor Declaration (NVD)
 - (d) National Sheep Health Statement

3. The mode of action of a pesticide refers to
 - (a) the way it is applied.
 - (b) its non-selective nature.
 - (c) how it kills or inactivates a pest.
 - (d) a plan to avoid resistance.

4. Artificial insemination can be very successful, but there may be issues with
 - (a) careless hygiene, spreading disease between females.
 - (b) females being overdosed with artificial hormones.
 - (c) a lack of superior sires to choose from.
 - (d) maintaining the integrity of the frozen semen container.

5. When a characteristic has a high heritability, it is mostly influenced by
 - (a) phenotype.
 - (b) genotype.
 - (c) environment.
 - (d) gametes.

See next page

6. Which factor does **not** affect the ability of a country to have a comparative advantage in a particular product?
- (a) availability of land
 - (b) cost of labour
 - (c) international exchange rate
 - (d) favourable climatic conditions
7. A direct example of producers responding to consumer trends is the
- (a) supply chain assurance program for live export.
 - (b) National Livestock Information System (NLIS).
 - (c) Computer Aided Livestock Marketing (CALM).
 - (d) Meat Standards Australia (MSA) grading system.
8. Duty of care in the workplace and to the environment is related directly to
- (a) sustainability.
 - (b) intergenerational equity.
 - (c) quality assurance.
 - (d) risk management.
9. When a newborn drinks colostrum the immunity it receives is known as
- (a) natural passive.
 - (b) natural active.
 - (c) artificial passive.
 - (d) artificial active.
10. While biological control is effective against pests, one of the **major** concerns about it is that
- (a) its effects may not be confined to the pests.
 - (b) the pest may develop resistance.
 - (c) it may not persist long enough.
 - (d) it may damage the environment.
11. A common risk avoidance tool in agriculture is
- (a) monoculture.
 - (b) diversification.
 - (c) niche marketing.
 - (d) increased land holdings.

12. A hypothesis should be
- (a) testable.
 - (b) replicated.
 - (c) randomised.
 - (d) standardised.
13. When a scientific experiment reports that the results are significant, it is telling the reader that
- (a) the experiment has been a resounding success.
 - (b) the results cannot be attributed to chance.
 - (c) there is more work to be done to prove the results beyond doubt.
 - (d) the data differences are very small.
14. Which of the following **best** describes a pedigree?
- (a) a method of predicting animal productivity
 - (b) a description of productive traits
 - (c) a method of tracking the ancestry of animals
 - (d) a ranking system for sires and dams based on genotypes
15. A whole farm budget is commonly used to
- (a) calculate farm equity.
 - (b) show periods of high debt.
 - (c) compare profitability of different enterprises.
 - (d) assist with farm planning and analysis.

End of Section One

See next page

- (b) When selecting sires using Estimated Breeding Values (EBVs) a financial comparison can be made. From the data below, select the sire whose EBVs will make a significant improvement in weaning weight and calculate the selected bull's financial value to the breeding herd outlined in part (a). (4 marks)

Weight Group Breedplan EBVs (kg) for Beef Cattle

Bull	Birth-weight	200-day growth	600-day weight
A	-1	+10	+45
B	+2	+14	+28
C	+5	+16	+50
D	+2	+10	+30
E	+1	+10	+40
Average	+2	+12	+35

Selected bull: _____

Financial value: _____

Question 16 (continued)

(c) (i) Define heritability. (2 marks)

(ii) If the heritability of weaning weight is 0.3, explain how this could influence your decision whether to purchase this bull or not. (3 marks)

Question 19

(16 marks)

A farmer producing prime lambs from pasture and feedlotting wants to check the financial viability of each method of production.

Income	Number of lambs	Kg/head	\$/kg	\$/head	Pasture Lambs	Feedlot Lambs
Pasture lamb sales	578	40	2.50	100	\$57 800	
Feedlot lamb sales	578	52	2.50	130		\$75 140
Total income					\$57 800	\$75 140

Costs		
Labour	\$2468	\$5018
Drenches	\$578	\$578
Vaccination	\$578	\$578
Lamb cartage	\$1156	\$1156
Commission on lamb sales	\$3179	\$3179
Feedlot ration		\$8670
Total costs	\$7959	\$19179
Gross margin		
Gross margin/head		

(a) From the budget above calculate the

(i) gross margin for each enterprise. (2 marks)

(ii) gross margin/head for each enterprise. (2 marks)

- (b) List **two** main reasons for the differences in gross margins between the enterprises. (2 marks)

- (c) Which of the calculations in part (a) provides the farmer with accurate data to manage his enterprises? (3 marks)

- (d) What advice would you give the farmer regarding the financial viability of the feedlot lamb enterprise? (3 marks)

- (e) List and discuss **two** strategies you could use to mitigate financial risk in this feedlot. (4 marks)

Question 21

(18 marks)

In some situations, growth promotants can increase profits without having a harmful effect on meat quality.

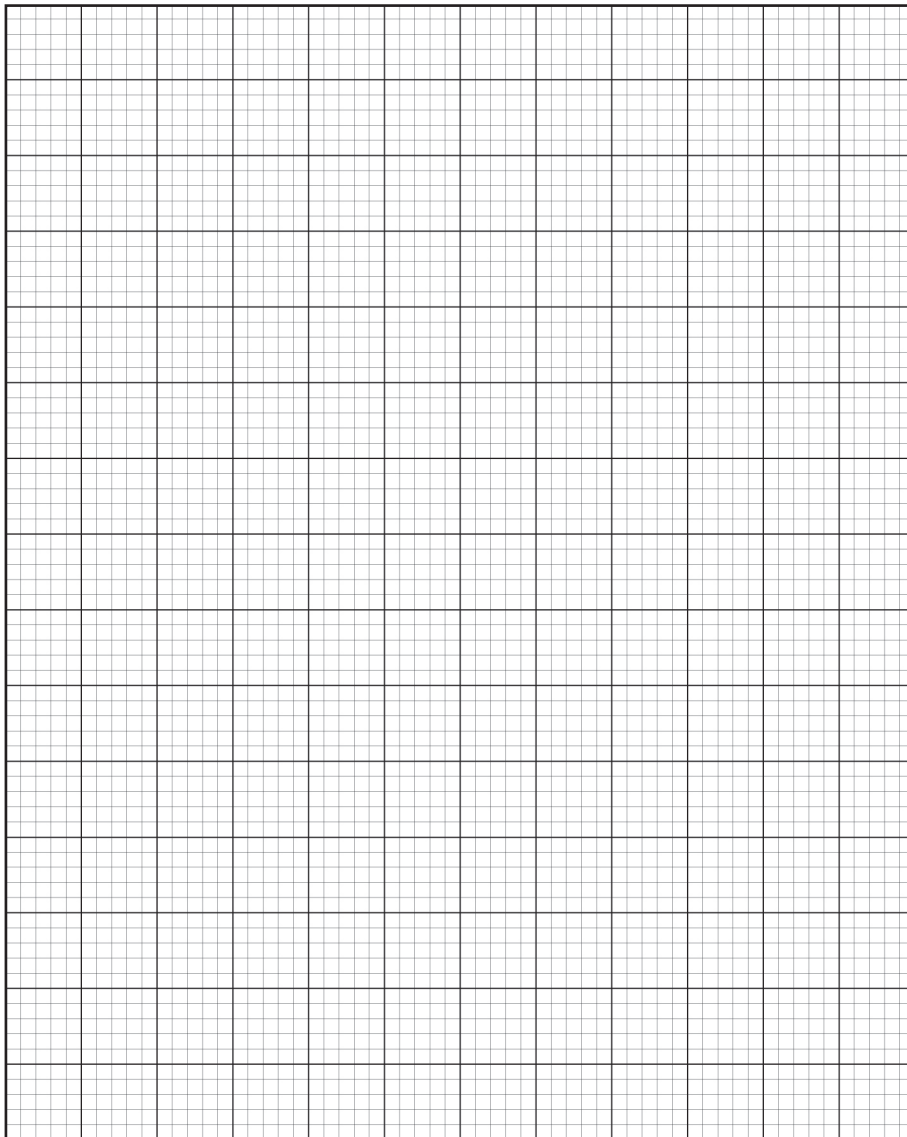
- (a) Explain the function of a growth promotant in livestock production. (2 marks)

- (b) Describe **one** advantage and **one** disadvantage of using growth promotants. (4 marks)

- (c) The data below was presented at a beef producers' seminar to encourage producers to use growth promotant treatments. (6 marks)

Treatment duration (days)	Mean liveweight gain of treated group (kg/head)	Mean liveweight gain of untreated group (kg/head)
0	0	0
20	15	20
40	40	50
60	70	65
80	100	80
100	140	110

On the grid below, draw a graph of the mean live weight gain of the treated and untreated groups over 100 days. If you need to make a second attempt at this graph, the grid is repeated on the last page of this Question/Answer booklet. Indicate on this page that you have used the second grid and cancel the workings on this page.



Question 22

(12 marks)

Within an ecosystem, the flow of energy can be identified.

- (a) Draw a diagram to show the energy flow between livestock, plants and decomposers in an agricultural ecosystem. Include references to energy losses in your diagram. (6 marks)



- (b) Is this a feedback loop? Explain your answer. (3 marks)

Question 23

(14 marks)

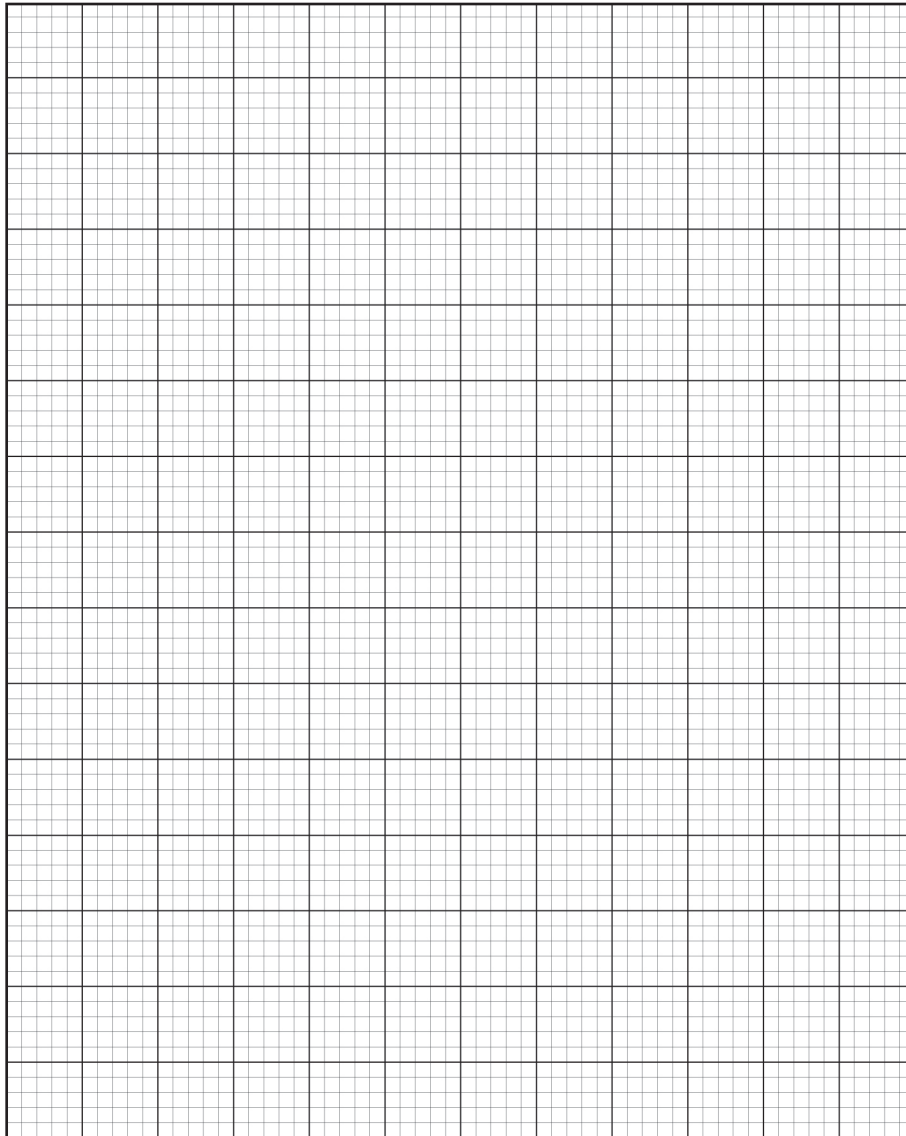
- (a) Describe the **two** stages of breakdown of carbohydrates in ruminants. (4 marks)

- (b) List **two** factors that determine the amount of energy you would include in the ration being fed to an animal. (2 marks)

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See next page

Question 21



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