



**FACULTY OF NATURAL RESOURCES MANAGEMENT AND  
AGRICULTURE**

**DEPARTMENT OF ANIMAL PRODUCTION AND HEALTH**

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**BACHELOR OF SCIENCE HONOURS DEGREE IN ANIMAL SCIENCE**

**ANIMAL FEED PRODUCTION (LAS 4201)**

Semester II, Main Examination

June 2025

**Time Allowed** : 3 hours  
**Special requirement** : Calculator  
**Examiner** : Mr. B Mpala

**Instructions to Candidates:**

1. This paper consists of six questions; answer **ALL** questions in **Section A** and **ANY TWO** in **Section B**.
2. Marks for each question are shown in brackets. Where a question has subdivisions, the marks for each subdivision are given.
3. Illustrate your answer, where applicable, with large clearly labelled diagrams.
4. Show all working for calculations.

<b>MARK ALLOCATION PER SECTION</b>	<b>MARKS</b>
SECTION A	<b>60</b>
SECTION B	<b>40</b>
<b>TOTAL ATTAINABLE MARKS</b>	<b>100</b>

*This paper consists of three printed pages including this one.*

**SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION**

**QUESTION 1**

- a) State one grass species, one fodder crop, and one forage legume species that may be suitable for the following:
- i). Dryland pastures. [3]
  - ii). Irrigated pastures. [3]
- b) Discuss the factors that influence the nutritional value of grasses used as livestock feed. 10]
- c) List four important considerations when processing roughages for feed production. [4]

**QUESTION 2**

You are to formulate a 100 kg poultry grower ration using the following ingredients and nutrient values:

- Maize meal: 9% CP
  - Soybean meal: 44% CP
  - Target crude protein (CP) for grower ration: 18%
- a) Calculate the proportion of maize meal and soybean meal required, and check the accuracy of your formulation. [6]
- b) If the cost of maize meal is US\$335/tonne and soybean meal is \$620/tonne, calculate the cost per 100 kg of the formulated ration. [4]
- c) State two anti-nutrients that may be present in the formulated ration, explain how they can affect poultry, and suggest measures to counteract their effects. [6]
- d) Suggest two feed additives that could be included in the ration you formulated in 2a) and justify their inclusion. [4]

**QUESTION 3**

- a) Discuss the use of urea as a source of nitrogen for ruminants and the factors that limit its utilisation in ruminant nutrition. [6]
- b) State two biological, two chemical and two physical hazards that may be encountered in an animal feed manufacturing plant. [6]
- c) Identify the Critical Control Points (CCPs) for the hazards you mentioned in 3 b) and propose the control measures you will implement in the feed manufacturing plant to mitigate these hazards. [8]

**SECTION B: ANSWER ANY TWO QUESTIONS IN THIS SECTION**

**QUESTION 4**

- a) Outline two advantages and two disadvantages of computer-aided feed formulation. [4]
- b) Discuss the role and importance of feeding standards in livestock nutrition. Include in your answer how they are used in diet formulation and nutrient partitioning across different physiological stages of livestock. [16]

**QUESTION 5**

- a) Discuss the use of ionophores and beta-adrenergic agonists in livestock production. [14]
- b) Discuss the concerns associated with using the technologies mentioned in 5a) above. [6]

**QUESTION 6**

Describe four common nutritional or metabolic disorders in dairy production. For each disorder, state the cause, symptoms, prevention strategies and the nutritional interventions used in managing them. [20]