



1ST SEM. 2005/2006

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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME: DIPLOMA IN AGRICULTURE AND
DIPLOMA IN AGRICULTURE
EDUCATION YEAR III**

COURSE CODE: APH 301

TITLE OF PAPER: NUTRITION, FEEDS AND FEEDING

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY 4 QUESTIONS.

**THIS PAPER MAY NOT BE OPENED UNTIL THE CHIEF
INVIGILATOR HAS GRANTED PERMISSION.**

QUESTION 1

- i. Describe and illustrate how ruminant animals digest and metabolize nitrogenous compounds in the rumen and its immediate surroundings. **(15 Marks)**
- ii. Explain the symbiotic relationship that exists between a ruminant animal and the microbial population resident in the rumen. **(10 Marks)**

QUESTION 2

- i. Identify and discuss FIVE factors that affect *in vivo* digestibility of livestock feeds. **(20 Marks)**
- ii. In a digestibility trial, how do you calculate the digestibility coefficient of a diet? Give two limitations of using digestibility coefficients in feed evaluation. **(5 Marks)**

QUESTION 3

A cow consumes 10.5 kg DM of hay containing 18.7 MJ/kg DM of gross energy (GE). It excretes 4.7 kg DM faeces containing 17.2 MJ/kg DM GE. Energy losses in the form of gases were estimated to be 8 % of GE intake. Energy losses in urine were estimated to be 10 % of digestible energy (DE).

- i. Provide an estimate of the digestible energy (DE) and metabolizable energy (ME) content of the hay expressed in MJ/kg DM. **(15 Marks)**
- ii. How do you calculate the total digestible nutrients (TDN) of a livestock feedstuff? **(6 Marks)**
- iii. Identify the limitations of the TDN system of feed evaluation **(4 Marks)**

QUESTION 4

- i. Given that cottonseed meal (CSM) has 40 % crude protein and maize meal has 10 % crude protein, formulate a 200 kg ration containing 15 % crude protein. You must show all calculations. You must calculate proportions of each ingredient and verify that you have the desired ration. **(15 Marks)**

ii. Write short notes on the following:

a. Digestible Crude Protein (DCP)

b. Rumen Degradable Protein (RDP)

(10 Marks)

QUESTION 5

i. Discuss the criteria used in the classification of feedstuffs giving appropriate examples. **(15 Marks)**

ii. What types of feedstuffs are available during the long dry season in Swaziland and how can these be utilized to, at least, maintain ruminant livestock throughout the dry season? **(10 Marks)**