



**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

PROGRAMME: B.Sc. IN ANIMAL SCIENCE

COURSE CODE: APH 304

TITLE OF PAPER: NUTRITIONAL BIOCHEMISTRY

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY 4 QUESTIONS.

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GRANTED BY THE CHIEF INVIGILATOR**

QUESTION 1

Discuss the anabolic process of sulphur containing amino acids from serine and explain why some animals can not synthesize these amino acid. **(25 Marks)**

QUESTION 2

Discuss and illustrate the production of three pentoses from glucose. **(25 Marks)**

QUESTION 3

Discuss the major differences between:

- a. Catabolism and anabolism **(8 Marks)**
- b. Eukaryotic and prokaryotic cell structure **(4 Marks)**
- c. Aerobic and anaerobic glycolysis. **(13 marks)**

QUESTION 4

- a. Discuss three major interdependent factors that influence the extent and type of fermentation that occurs in the rumen. **(15 marks)**
- b. Ruminants are able to degrade and rebuild proteins using non-protein nitrogen (NPN) sources. Briefly discuss the positive and negative consequences of this process for the ruminant. **(10 marks)**

QUESTION 5

Figure 1 depicts concentration of rumen metabolites in sheep fed maize stover supplemented with a readily degradable protein.

- a. Briefly discuss the efficiency of use of the protein by animal as depicted in Figure 1.

(12 marks)

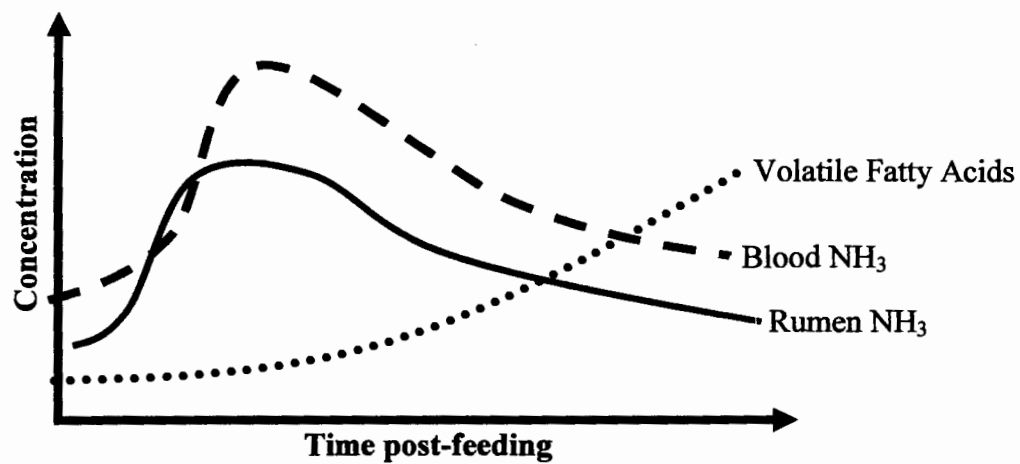


Figure 1: Rumen metabolites of sheep fed maize stover supplemented with a readily degradable protein source.

- b. What are the benefits of feeding ruminants a rumen undegradable protein?

(5 marks)

- c. What measures can be done to protect proteins from rumen degradation?

(8 marks)