

BIOCHEMISTRY

UNIT CODE: 0512 441 06A

TVET CDACC UNIT CODE: HE/CU/AHP/CC/02/5/MA

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply knowledge of biochemistry

Unit Duration: 50 hours

Unit Description

This unit specifies the competencies required by an animal health and production technician to apply knowledge of biochemistry in animal health and production. It involves applying the knowledge of macromolecules, enzymes in managing animal health, molecular genetics and biomolecule metabolism in animal health.

Summary of Learning Outcomes

By the end of this unit, the learner should be able to:

S/No	Learning Outcomes	Duration (Hours)
1.	Apply knowledge of macromolecules in animal health	10
2.	Apply knowledge of enzymes in managing animal health	10
3.	Apply knowledge of molecular genetics	15
4.	Apply knowledge of the biomolecule metabolism in animal health	15
Total		50

Learning Outcomes, Content, and Suggested Assessment Methods

Learning Outcome	Content	Methods of assessment
1. Apply knowledge of macromolecules in animal health	1.1 Introduction to biochemistry 1.1.1 Define biochemistry 1.1.2 Basic structure of a	● Practical ● Project ● Written tests

	living cell and how it is organized to conduct its characteristic chemical function 1.2 Types of macromolecules 1.2.1 Carbohydrates 1.2.2 Proteins 1.2.3 Vitamins 1.2.4 Minerals 1.2.5 Lipids 1.3 Biochemistry of carbohydrates Structure 1.3.1 Properties and classification of carbohydrates 1.3.2 Carbohydrate metabolism 1.3.3 Energy pathways and metabolic disorders of carbohydrate metabolism 1.4 Biochemistry of proteins 1.4.1 Structure 1.4.2 Properties and classification of proteins 1.4.3 Protein metabolism 1.4.4 Metabolic pathways and metabolic disorders of protein metabolism 1.5 Biochemistry of lipids 1.5.1 Structure, properties	● Third party report ● Portfolio of evidence ● Oral questions
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	and classification of lipids 1.5.2 Lipid metabolism 1.5.3 Metabolic pathways and metabolic disorders of lipid metabolism 1.6 Biochemistry of vitamins: 1.6.1 Structure 1.6.2 Properties 1.6.3 Classification, biochemical role 1.6.4 Metabolism, and metabolic disorders of lipid metabolism	
2. Apply knowledge of enzymes in managing animal health	2.1 Basic concepts of enzymes 2.1.1 Isoenzymes 2.1.2 Holoenzymes 2.1.3 Coenzymes 2.1.4 Apoenzymes 2.2 Management of catalytic reactions 2.3 Enzyme metabolism	● Practical ● Project ● Written tests ● Third party report ● Portfolio of evidence ● Oral questions
3. Apply knowledge of molecular genetics	3.1. Principles of molecular genetics 3.2. Classification of Nucleic acids 3.3. Nucleic acid metabolism 3.4. Pentose sugars in nucleic acid 3.4.1. DNA replication 3.4.2. DNA transcription	● Practical ● Project ● Written tests ● Third party report ● Portfolio of evidence ● Oral questions
4. Apply knowledge of the biomolecule metabolism in	4.1 Biomolecule metabolism	● Practical ● Project

animal health	4.2 Types of biomolecules 4.2.1 Carbohydrates 4.2.2 Proteins 4.2.3 Vitamins 4.2.4 Minerals 4.2.5 Lipids 4.3 Metabolic pathways 4.3.1 Glycolytic pathway 4.3.2 Krebs cycle 4.4 Management of effects of biomolecule metabolism.	● Written tests ● Third party report ● Portfolio of evidence ● Oral questions
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Suggested Methods of Delivery

- Practical
- Projects
- Demonstrations
- Group discussion
- Direct instructions

Training resources for 25 trainees

S/No.	Category/Item	Description/Specification	Quantity	Recommended Ratio (Item: Trainee)
A	Learning materials			
1	Projector		1	1:25
2	Whiteboard/Smartboard	EPSOM	1	1:25
3	Desktop/computer		1	1:25
B	Learning Facilities & Infrastructure			
1	Lecture/Theory room	With at least 25 seats	1	1:25
2	Biochemistry laboratory		1	1:25
3	Animal farm	As guided by KVB	1	1:25
4	Library	Equipped with biochemistry books and E-section	1	

C	Consumable Materials			
D	Tools and Equipment			
	Centrifuges		1	1:25
	Autoclaves		1	1:25
	Incubators		1	1:25
	Microscopes		5	1:5
	Electrophoresis		1	1:25
	Beakers	200 pcs	-	-
	Calorimeter		5	1:5
	Graduated cylinder	200 pcs	-	-
	Water bath	Enough		
	Funnel		25	1:1
	pH Meter		5	1:5
	Bunsen burner		25	1:1
	Analytical balance		5	1:5
	Test tubes	200 pcs	-	-