

DAIRY PRODUCT QUALITY CONTROL

ISCED UNIT CODE: 0721 451 10A

TVET CDACC UNIT CODE: DA/CU/PM/CR/02/5/MA

Relationship to Occupational Standards

This unit addresses the Unit of Competency: **Conduct Dairy Product Quality Control**

Duration: 200 Hours

Unit Description

This unit specifies the competencies required by a Dairy Plant Technician Level 6 to Conduct Dairy Product quality control. It involves analyzing raw materials and ingredients, monitoring production process, analyzing end product quality and implementing quality control measures

Summary of Learning Outcomes

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

S/No	Learning Outcomes	Duration (Hours)
1.	Analyse raw materials and ingredients	50
2.	Monitor production process	50
3.	Analyse end product quality	50
4.	Analyse product handling condition quality	50
Total		200

Learning Outcomes, Content, and Suggested Assessment Methods

Learning Outcomes	Content	Suggested Assessment Methods
1. Analyse raw materials and ingredients	1.1 Concept of Quality Control 1.1.1 Definition of terms 1.1.2 Quality characteristics of milk 1.1.3 Importance of Quality Control 1.1.4 Methods of quality assessment 1.1.4.1 Objective methods	<ul style="list-style-type: none">Written testsInterviews/ Oral questionsPractical reportsIndividual/group assignmentsCase Studies

	<p>1.1.4.2 Subjective methods</p> <p>1.1.5 Statistical Methods</p> <p>2.1 Factors affecting quality of Raw Milk</p> <p>2.1.1 Genetic factors</p> <p>2.1.2 Production factors</p> <p>2.12 Laboratory reagents, tools and equipment</p> <p>2.12.1 Laboratory reagents</p> <p>2.12.1.1 Types</p> <p>2.12.1.2 Preparation of laboratory reagents</p> <p>2.12.2 Laboratory tools and equipment</p> <p>2.12.3 Laboratory safety rules</p> <p>2.13 Raw milk quality Analysis</p> <p>2.13.1 Raw milk quality tests</p> <p>2.13.1.1 Organoleptic</p> <p>2.13.1.2 Physical /chemical tests</p> <p>2.14 Record-keeping</p> <p>2.14.1 Definition of terms</p> <p>2.14.2 Types of records</p> <p>2.14.3 Importance of record keeping</p> <p>2.15 Smart and Sustainable Systems</p> <p>2.15.1 AI application</p> <p>2.15.2 Sustainable waste disposal</p> <p>2.16 Apply Smart and Sustainable Systems</p> <p>2.6.1 AI application</p> <p>2.6.2 Sustainable waste disposal</p>	<ul style="list-style-type: none"> • Third party report
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------

3 Monitor production process	<p>3.1 Process controls</p> <ul style="list-style-type: none"> 3.1.1 Pasteurization temperature 3.1.2 Pasteurization time 3.1.3 Chilling temperatures 3.1.4 Sterilization temperatures 3.1.5 Standardization <p>3.2 Process Quality Analysis</p> <ul style="list-style-type: none"> 3.2.1 Alkaline phosphatase test 3.2.2 Stability test 3.2.3 Peroxidase 3.2.4 Acidity 3.2.5 Salt content 3.2.6 Butter fat content 3.2.7 pH 3.2.8 A.I <p>3.3 Smart and Sustainable Systems</p> <ul style="list-style-type: none"> 3.3.1 AI application 3.3.2 Sustainable waste disposal 	<ul style="list-style-type: none"> • Written tests • Interviews/ Oral questions • Practical reports • Individual/group assignments • Case Studies • Third party report
4 Analyse End product quality	<p>4.1 Sensory evaluation of milk products</p> <ul style="list-style-type: none"> 4.1.1 Flavour 4.1.2 Colour 4.1.3 Taste 4.1.4 Consistency 4.1.5 Viscosity 4.1.6 Appearance <p>4.2 End product quality Analysis tests</p> <ul style="list-style-type: none"> 4.2.1 Phosphatase 	<ul style="list-style-type: none"> • Written tests • Interviews/ Oral questions • Practical reports • Individual/group assignments • Case Studies • Third party report

	<p>4.2.2 Sterility</p> <p>4.2.3 Peroxidase</p> <p>4.2.4 Acidity</p> <p>4.2.5 Salt content</p> <p>4.2.6 Butter fat content</p> <p>4.2.7 pH</p> <p>4.2.8 Total plate count</p> <p>4.2.9 Coliforms plate count</p> <p>4.2.10 Yeast and mould count</p> <p>4.2.11 A.I</p> <p>4.3 Shelf-life Evaluation</p> <p>4.3.1 Definitions</p> <p>4.3.2 Methods of determining shelf-life</p> <p>4.3.3 Factors affecting shelf-life of milk products</p> <p>4.3.4 Importance of shelf-life evaluation</p> <p>4.4 Packaging and labelling evaluation</p> <p>4.3.5 Labelling</p> <p>4.3.6 Packaging</p> <p>4.5 Smart and Sustainable Systems</p> <p>3.5.1 AI application</p> <p>3.5.2 Sustainable waste disposal</p>	
5 Analyse product handling condition quality	<p>5.1 Storage Conditions for dairy Products</p> <p>5.2.1 Temperature</p> <p>5.2.2 Duration</p> <p>5.2.3 Humidity</p>	<ul style="list-style-type: none"> • I Written tests • Interviews/ Oral questions • Practical reports

	<p>5.2.4 Lighting</p> <p>5.2.5 A.I</p> <p>5.2 Evaluation of Personnel hygiene</p> <p>5.3.1 Personnel Hygiene measures</p> <p>5.3.2 Personnel swab</p> <p>5.3.3 Personnel Protective Equipment</p> <p>5.3.4 Food handler's health compliance</p> <p>5.3 Evaluation of Dairy premises and Equipment</p> <p>5.3.1 Premises</p> <p>5.3.2 Lighting</p> <p>5.3.3 Ventilation</p> <p>5.3.4 Design and plant layout</p> <p>5.3.5 Hygiene and sanitation</p> <p>5.4 Equipment</p> <p>5.4.1 Food contact Materials</p> <p>5.4.2 Hygiene, sanitation and waste management</p> <p>5.5 Smart and Sustainable Systems</p> <p>5.5.1 AI application</p> <p>5.5.2 Sustainable waste disposal</p>	<ul style="list-style-type: none"> • Individual/group assignments • Case Studies • Third party report
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------

Suggested Methods of Instruction

- Demonstrations
- Group discussion
- Direct instruction

- Role playing

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	Learning Materials			
1.	Textbooks		5 pcs	1:5
2.	Production Manuals		5	1;5
3.	PowerPoint presentations	For trainer's use		
4.	Projector		1	1;25
5.	Assorted Flash Cards		5	1;5
6.	Whiteboard		1	1;25
7.	Rolls flip charts		1	1;25
8.	Assorted color of whiteboard markers	For trainers Use		
B	Learning Facilities & infrastructure			
1.	Lecture/theory room		1	1:25
2.	Workshop		1	1:25
3.	Laboratory		1	1:25
4.	Site/industry		1	1:25
C	Consumable materials			
1.	Raw milk		1ltr	1:5
2.	Cream		10mls	10:5
3.	Yoghurt		1	1;5
4.	Butter		-	-
5.	Ghee		1ltr	1:5
6.	Ethanol		100mls	100;5
7.	Sodium Hydroxide		500mls	500;5
8.	Resazurin solution		10mls	10:5
9.	Iodine		-	-
10.	Phenolphthalein indicator		-	-
D	Tools and Equipment			
1.	Alcohol gun		5 pcs	1:5
2.	Lactometer		5pcs	1;5
3.	Thermometer		5 pcs	1:5
4.	Centrifuge		1 pcs	1:25
5.	Clarifier		1pcs	5:25

6.	Pasteurizer		1 pcs	1:25
7.	Homogenizer		1 pcs	1:25
8.	Lovi bond Comparator		1pcs	1:25
9.	Source of heat		1	1:25
10.	Refractometer		5	1;25