

FOPBK303

BASIC KNOWLEDGE IN FOOD PROCESSING

Apply Basic Knowledge in Food Processing

Competence

RQF Level: 3

Learning Hours



40

Credits: 4

Sector: Agriculture and Food Processing

Trade: Food Processing

Module Type: General

Curriculum: AGRFOP3003- TVET Certificate 3 Food Processing

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Purpose statement	This module provides the skills, knowledge and attitude for a learner to be competent in a range of routine tasks and activities carried out in food industry. Upon completion of this module the learner will be able to apply basics of thermodynamic, apply basics knowledge of food chemistry and describe micro-organisms in food at high effectiveness under regular and directive supervision.					
D	Training delivery		100%	Assessment		Total 100%
	Theoretical content		30%	Formative assessment	30%	50%
	Practical work:		70%		70%	
	• Group project and presentation	20%				
	• Individual project /Work	50%				
			Summative Assessment			50%

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Apply basics of thermodynamic	1.1. Physical quantities are properly described according to their use
	1.2. Heat transfer mechanisms are appropriately described according to means of heat transfer
	1.3. Physical properties of food are adequately described according to the types of food
2. Apply basics knowledge of food chemistry	2.1. Main food components are appropriately identified according to type of food
	2.2. The solution is properly prepare according to proportion of solute and solvent
	2.3. The Acids and Bases are clearly described according to concept(Arrhenius)
	2.4. Food additives are correctly identified according to their composition and types
3. Describe micro-	3.1. Food microorganisms are properly classified according to their type

organisms in food	and sources
	3.2. Factors Influencing Microbial Growth in Food are identified according to their types
	3.3. Harmful and beneficial microorganisms are properly differentiated in food according to product specification

Learning outcomes	At the end of the module the learner will be able to: 1. Apply basics of thermodynamic 2. Apply basics knowledge of food chemistry 3. Describe micro-organisms in food
Learning outcome 1: Apply basics of thermodynamic	Learning hours: 10
Indicative content	
• Description of physical quantities ✓ Fundamental quantities  Length  Mass  Time  Temperature ✓ Derived quantities  Volume  Density  Area  Weight and  Force • Identification uses of physical quantities • Description of Heat transfer mechanisms ✓ Conduction ✓ Convection ✓ Radiation	

- Differentiation of the types of food
 - ✓ Cereals
 - ✓ Legumes
 - ✓ Vegetables
 - ✓ Fruits
 - ✓ Tubers and roots
 - ✓ Foods of Animal origin (Milk, Meat, fish, honey)
- Description of the physical properties of different types of food
 - ✓ Density
 - ✓ Viscosity
 - ✓ Colour
 - ✓ Moisture content
 - ✓ Solubility
 - ✓ Taste
 - ✓ Hygroscopicity`
 - ✓ Boiling and melting point
 - ✓ Volatility

Resources required for the learning outcome

Equipment	Projector, chalkboard, whiteboard, computer
Materials	Electric wires, chalks, marker pen, flip charts,
Tools	Tape measure, balance, thermometer, watch, graduated cylinder, densimeter, colorimeter, moist meter, fullness, books, notebook, calculator
Facilitation techniques	• Demonstration • Individual and group work • Practical exercise • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment

- Product based assessment

Learning outcome 2: Apply basics knowledge of food chemistry

Learning hours: 20

Indicative content

- Description of food components
 - ✓ Carbohydrates
 - ✓ Proteins
 - ✓ Lipids
 - ✓ Minerals
 - ✓ Water
 - ✓ Vitamins
- Differentiation of solute and solvent
- Identification of the types of solution
 - ✓ Based on physical state
 - ✚ Solid
 - ✚ Liquid
 - ✚ Gas
 - ✓ Based on nature of mixture
 - ✚ Homogeneous
 - ✚ Heterogeneous
 - ✓ Based on Solute/solvent proportion
 - ✚ Saturated solution
 - ✚ Unsaturated solution
 - ✚ Supersaturated solution
- preparation of solution

-  Weighing
-  Dissolution
-  Dilution

- Description of acid and base
 - ✓ Definition of acid and base according to Arrhenius
 - ✓ Physical properties of acid and base
 - ✓ Use of acid and base
- Identification of food additives
 - ✓ Types of food additives
 - ✓ Composition of food additives
 - ✓ Usage of food additives

Resources required for the indicative content

Equipment	Projector, Chalkboard, Whiteboard, computer
Materials	Marker pens, pencils, chalk, indicator(litmus, phenolphthalein, ...), NaOH, HCl, H ₂ SO ₄ , distilled water, buffer solution, flip chart, food additives
Tools	Calculator, books, notebook, papers, measuring cylinder, test tube, conical flask, burette, pipette, wash bottle, pHmeter,
Facilitation techniques	• Demonstration and simulation • Individual and group work • Practical exercise • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment • Product based assessment

Learning outcome 3: Describe micro-

Learning hours: 10

organisms in food	
Indicative content	
• Classification of food microorganisms ✓ Types of food microorganisms ✓ Sources of food microorganisms • Identification of factors affecting microbial growth in food ✓ Physical factors ✚ Temperature ✚ Moisture content ✚ pH ✚ Osmotic pressure ✓ Availability of oxygen (Oxygen requirements) ✓ Nutritional (biochemical) factors ✓ Nature of food • Differentiation of Harmful and beneficial microorganisms in food ✓ Harmful microorganisms ✓ Beneficial microorganisms ✓ Uses of beneficial microorganisms	
Resources required for the indicative content	
Equipment	Projector, Chalkboard, Whiteboard, computer,
Materials	chalks, marker pen, Flip charts, sample
Tools	Books, Notebook, Papers
Facilitation technique	• Demonstration • Individual and group work • Practical exercise • Group discussion
Formative assessment	• Written assessment

References:

1. David, h. R. (2011). Fundamentals of physics 9th edition. Jefferson: john willey & sons.
2. Harlow: PEARSON. Moore, J. T. (2012). Chemisrty II For Dummies. John Wiley & Sons
3. J.F.T. Spencer & A.L. R de Spencer, 2001. Food Microbiology Protocols, Humana Press
4. L.M. Prescott, 2002. Microbiology, 5th Ed., The McGraw Hill
5. Lister, T., & Renshaw. (1995). Understanding Chemistry for Advanced Level (second ed.). Stanley Thornes.
6. Nelkon&parker. (2001), advanced level physics 7th edition, heinemann