

**REPUBLIC OF KENYA**

**COMPETENCY BASED MODULAR CURRICULUM**

**FOR**

**BEE PRODUCTS PROCESSING**

**KNQF LEVEL 4**

**PROGRAMME ISCED CODE: 0811 354 A**

©2025

All rights reserved. No part of this Curriculum may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods without the prior written permission of …….., except in the case of brief quotations embodied in critical reviews and certain other non-commercial uses permitted by copyright law. For permission requests, write to the Council Secretary/CEO/Chief Principal at the address below:

# 

# FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social and economic development. Quality education and training contribute to the achievement of Kenya’s development blueprint and sustainable development goals.

Reforms in the education sector are necessary to achieve Kenya Vision 2030 and meet the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution, and this resulted in the formulation of the Policy Framework for Reforming Education and Training in Kenya (Sessional Paper No. 14 of 2012). A key feature of this policy is the radical change in the design and delivery of TVET training. This policy document requires that training in TVET be competency-based, curriculum development be industry-led, certification be based on demonstration of competence, and the mode of delivery allow for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this curriculum has been developed. For trainees to build their skills on foundational hands-on activities of the occupation, units of learning are grouped in modules. This has eliminated duplication of content and streamlined exemptions based on skills acquired as a trainee progresses in the up-skilling process, while at the same time allowing trainees to be employable in the shortest time possible through the acquisition of part qualifications.

It is my conviction that this curriculum will play a great role in developing competent human resources for the Bee products processing Sector’s growth and development.

**PRINCIPAL SECRETARY**

**STATE DEPARTMENT FOR TVET**

**MINISTRY OF EDUCATION**

**PREFACE**

Kenya Vision 2030 aims to transform Kenya into a newly industrializing middle-income country, providing high-quality life to all its citizens by the year 2030. Kenya intends to create globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through lifelong education and training. TVET has a responsibility to facilitate the process of inculcating knowledge, skills, and worker behaviour necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency-Based Education and Training (CBET).

TVET Act, CAP 210A and Sessional Paper No. 1 of 2019 on Reforming Education and Training in Kenya for Sustainable Development emphasized the need to reform curriculum development, assessment, and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry, as well as increase the global competitiveness of the Kenyan labour force.

This curriculum has been developed in adherence to the Kenya National Qualifications Framework and CBETA standards and guidelines. The curriculum is designed and organized into Units of Learning with Learning Outcomes, suggested delivery methods, learning resources, and methods of assessing the trainee’s achievement. In addition, the units of learning have been grouped in modules to concretize the skills acquisition process and streamline up skilling.

I am grateful to all expert trainers and everyone who played a role in translating the Occupational Standards into this competency-based modular curriculum.

# ACKNOWLEDGMENT

This curriculum has been designed for competency-based training and has independent units of learning that allow the trainee flexibility in entry and exit. In developing the curriculum, significant involvement and support were received from expert trainers, institutions and organizations.

I recognize with appreciation the role of the Agriculture National Sector Skills Committee (NSSC) in ensuring that competencies required by the industry are addressed in the curriculum. I also thank all stakeholders in the Agricultural sector for their valuable input and everyone who participated in developing this curriculum.

I am convinced that this curriculum will go a long way in ensuring that individuals aspiring to work in the Agricultural Sector acquire competencies to perform their work more efficiently and effectively.

Table of Contents

[FOREWORD ii](#_Toc196924385)

[ACKNOWLEDGMENT iv](#_Toc196924386)

[ABBREVIATIONS AND ACRONYMS vi](#_Toc196924387)

[KEY TO UNIT CODE vii](#_Toc196924388)

[COURSE OVERVIEW viii](#_Toc196924389)

[MODULE I xi](#_Toc196924390)

[BEE PRODUCTS HARVESTING 1](#_Toc196924391)

[HONEY PROCESSING 4](#_Toc196924392)

[BEE WAX PROCESSING 7](#_Toc196924393)

[PROPLIS PROCESSING 9](#_Toc196924394)

[MODULE II 11](#_Toc196924395)

[POLLEN PROCESSING 12](#_Toc196924396)

[BEE VENOM PROCESSING 14](#_Toc196924397)

[BEE PRODUCTS VALUE ADDITION 17](#_Toc196924398)

[BEE PRODUCT QUALITY CONTROL 21](#_Toc196924399)

ABBREVIATIONS AND ACRONYMS

AGR : Agriculture

APIPR : Apiculture process

CC : Core Competency

CDACC : Curriculum Development Assessment and Certification Council

CU : Curriculum

KCSE : Kenya Certificate of Secondary Education

KNQA : Kenya National Qualifications Authority

OSHA : Occupation Safety and Health Act

PPE : Personal Protective Equipment

SSAC : Sector Skills Advisory Committee

TVET : Technical and Vocational Education and Training

TVETA : Technical and Vocational Education and Training Authority

# KEY TO UNIT CODE

Sector / Industry

Sub Sector

Curriculum Area

Version Control

Unit of Competence Number

ISCED level, Programme Orientation and Level of Completion

xx

x

xxx

x

x

x

# COURSE OVERVIEW

Bee products processing Level 4 qualification consists of competencies that an individual must have to harvest bee products, process honey, bees wax, propolis, pollen, and bee venom. It involves performing bee product value addition and managing quality of bee products.

The units of learning leading to Bee products processing Level 4 qualification include the following units:

**SUMMARY OF UNITS OF LEARNING**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Category** | **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| Core | 0811 341 01 A | Bee Products Harvesting | 30 | 3 |
| Core | 0811 341 02 A | Honey Processing | 70 | 7 |
| Core | 0811 341 03 A | Bees Wax Processing | 70 | 7 |
| Core | 0811 341 04 A | Propolis Processing | 60 | 6 |
|  | **TOTAL** | | **230** | **23** |
|  | **MODULE II** | | | |
| Core | 0811 341 05 A | Pollen Processing | 40 | 4 |
| Core | 0811 341 06 A | Bee Venom Processing | 30 | 3 |
| Core | 0811 341 07 A | Bee Products Value Addition | 50 | 5 |
| Core | 0811 341 08 A | Bee Product Quality Control | 50 | 5 |
|  | **Industrial training** | | 320 | 32 |
|  | **Grand Total** | | **720** | **72** |

**Entry Requirements**

An individual entering this course should have any of the following minimum requirements:

a) Kenya Certificate of Secondary Education (KCSE)

**Or**

b) Equivalent qualifications as determined by TVET Authority

**Trainer’s qualification**

A trainer for this course should have a:

1. Higher qualification than the level 4 in bee products and processing or in a related trade area; and
2. License by TVETA.

**Industrial training**

An individual enrolled in this course will be required to undergo Industry training for a minimum period of 320 hours in the agriculture sector. The industrial training may be undertaken after completion of all units for those pursuing the full qualification or be distributed equally in each unit for those pursuing partial qualification. In the case of dual training model, industrial training shall be as guided by the dual training policy.

**Assessment**

The course shall be assessed formatively and summatively:

1. During formative assessment all performance criteria shall be assessed based on performance criteria weighting.
2. Number of formative assessments shall minimally be equal to the number of elements in a unit of competency
3. Assessment of basic and common competencies shall be integrated in the core units
4. Theoretical assessment shall be integrated in practical assessment and conducted orally in both formative and summative assessments.
5. Theoretical and practical weight shall be 10:90 respectively for each unit of learning.
6. Formative and summative assessments shall be weighted at 60% and 40% respectively in the overall unit of learning score
7. Assessment performance rating for each unit of competency shall be as follows:

|  |  |
| --- | --- |
| **MARKS** | **COMPETENCE RATING** |
| 80 -100 | Attained Mastery |
| 65 - 79 | Proficient |
| 50 - 64 | Competent |
| 49 and below | Not Yet Competent |
| Y | Assessment Malpractice/irregularities |

1. Assessment for Recognition of Prior Learning (RPL) may lead to award of part and/or full qualification.

**Certification**

A candidate will be issued with a Certificate of Competency upon demonstration of competence in a Unit of Competency. To be issued with the Kenya National TVET Certificate in Bee Product Processing Level 4, the candidate must demonstrate competence in all the Units of Competency as given in the qualification pack. . A Statement of Attainment certificate may be issued upon demonstration of competence in certifiable element within a unit.

These certificates will be issued by Qualification Awarding Institution.

# 

# MODULE I

## 

## BEE PRODUCTS HARVESTING

**UNIT CODE:** 0811 341 01 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Harvest Bee Products

**Duration of Unit:** 30 hours

**Unit Description**

This unit specifies the competencies required to harvest bee products. It involves preparing to harvest bee products, conducting bee product harvesting, extracting bee products and performing post-harvest practices.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare to harvest bee products | 10 |
| 2. | Conduct bee product harvesting | 5 |
| 3. | Extract bee products | 5 |
| 4. | Perform post-harvest practices | 10 |
| **Total** | | **30** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare to harvest bee products | * 1. Meaning of terms honey, propolis, bees wax, royal jelly, bee venom, bee brood, pollen, bee bread * Uses of bee products   1. Materials, tools and equipment for harvesting bee products   2. Bee harvest timing and weather conditions   3. Occupational health and safety procedures in bee products harvesting   4. Smoker lighting and types of smoker fuel   5. Protective dressing for bee products harvesting | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Conduct bee product harvesting | * 1. Procedure for hive opening   2. Characteristics of ripe honey   3. Handling honey and brood combs   4. Honey harvesting techniques   5. Propolis harvesting techniques   6. Procedure for harvesting royal jelly   7. Pollen harvesting techniques | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |
| 1. Extract bee products | * 1. Materials and tools for extracting bee products i.e. honey, propolis, bees wax, royal jelly, bee venom, bee brood, pollen   2. Procedure for extracting bee products i.e. honey, propolis, bees wax, royal jelly, bee venom, bee brood, pollen   3. Hygienic handling harvested bee products   4. Occupational health and safety procedures in bee products extraction | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Perform post-harvest practices | * 1. Sorting of bee products   2. Grading of bee products   3. Weighing and grading equipment   4. Types of bee production records and their preparation   5. Transportation methods for bee products   6. Bee products storage equipment and conditions | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Propolis collector
* Pollen trap
* Honey extractor
* Venom collector
* Harvesting containers
* Smokers
* PPE kit
* Bees wax extractor
* Bee brush
* Bee escape
* Food grade storage equipment

## HONEY PROCESSING

**UNIT CODE:** 0811 341 02 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Process honey

**Duration of Unit: 70** hours

**Unit Description**

This unit specifies the competencies required to process honey. It involves preparing materials for processing honey, preparing processing equipment, processing honey and performing post processing procedures.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare materials for processing honey | 20 |
| 2. | Prepare processing equipment | 20 |
| 3. | Process honey | 20 |
| 4. | Perform post processing procedures | 10 |
| **Total** | | **70** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare materials for processing honey | * 1. 1.1 Identification and assembling materials for processing honey   2. 1.2 Sorting materials for processing honey | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Prepare processing equipment | * 1. Identification of processing equipment   2. Assembling processing equipment   3. Setting up the processing equipment   4. Hygienic and safety measures in preparation of processing equipment | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process honey | * 1. Identification of the state, types and form of honey   2. Characteristics of honey   3. Methods of honey processing   4. Characteristics of processing facilities   5. Procedure for processing honey   6. Storage requirements/condition for raw and processed honey   7. Storage equipment for raw and processed honey   8. Procedure for storing processed honey | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |
| 1. Perform post processing procedures | * 1. Identification of packaging materials and equipment   2. Procurement of packaging materials and equipment   3. Procedure for packaging processed honey   4. Branding and labelling of packaging materials   5. Storage of packaged honey | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Processing facilities
* Refractometer
* Honey
* Packaging materials
* Labels
* Processing equipment
* Honey extractors
* Straining cloth
* Uncapping knives
* Uncapping tray
* Heaters and honey warmers
* PPE
* Settling tanks
* Containers
* Weighing balance

## BEE WAX PROCESSING

**UNIT CODE:** 0811 341 03 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Process bees’ wax

**Duration of Unit: 70** hours

**Unit Description**

This unit specifies the competencies required to process beeswax. It involves preparing materials for processing bees wax, preparing processing equipment, processing bees wax and performing post processing procedures.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare materials for processing bees wax | 20 |
| 2. | Prepare processing equipment | 20 |
| 3. | Process bees wax | 20 |
| 4. | Perform post processing procedures | 10 |
| **Total** | | **70** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare materials for processing bees wax | * 1. 1.1 Identification of raw materials for processing bees wax * Types of combs * Sorting of combs   1. 1.2 Assembling raw materials for processing bees wax | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Prepare processing equipment | * 1. Identification of the processing equipment   2. Assembling processing equipment   3. Setting up processing equipment   4. Safety and hygiene measures in processing | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process bees wax | * 1. Selection of the processing method   2. Procedure for processing bee’s wax   3. Settling of bees wax   4. Storage conditions for processed wax   5. Storage equipment for processed bee’s wax   6. Procedure for storage of bee’s wax   7. Safety and hygiene measures while storing bees wax | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |
| 1. Perform post processing procedures | * 1. Packaging, labelling and storage of bee wax   2. Management and disposal of wastes | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Packaging material
* Packaging equipment
* Wax straining bag
* Steam wax extractors
* Processing equipment
* Molds
* Storage equipment
* Bar soap
* Source of heat
* Combs

## PROPLIS PROCESSING

**UNIT CODE:** 0811 341 04 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: process propolis

**Duration of Unit: 60** hours

**Unit Description**

This unit specifies the competencies required to process propolis. It involves preparing materials for processing propolis, preparing processing equipment, processing propolis and performing post processing procedures.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare materials for processing propolis | 20 |
| 2. | Prepare processing equipment | 20 |
| 3. | Process propolis | 10 |
| 4. | Perform post processing procedures | 10 |
| **Total** | | **60** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare materials for processing propolis | * 1. 1.1 Identification of materials for processing propolis   2. 1.2 Assembling of materials for processing propolis   3. 1.3 Sorting of materials for processing propolis | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Prepare processing equipment | * 1. Identification of processing methods   2. Identification of processing equipment   3. Assembling processing equipment   4. Setting up processing equipment | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process propolis | * 1. Collection of propolis   2. Cleaning propolis/removal of foreign materials   3. Processing procedure for propolis   4. Storage conditions for processed propolis   5. Storage equipment for propolis   6. Procedure for storing processed propolis | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Perform post processing procedures | * 1. Packaging materials and equipment   2. Labelling materials and equipment   3. Management and disposal of waste | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Raw propolis
* Propolis cleaning materials
* Solvents
* Source of heat
* Packaging and labelling materials
* Storage facilities

# MODULE II

## POLLEN PROCESSING

**UNIT CODE:** 0811 341 05 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Process pollen

**Duration of Unit: 40** hours

**Unit Description**

This unit specifies the competencies required to process pollen. It involves preparing materials for processing pollen, preparing processing equipment, processing pollen and performing post processing procedures.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare materials for processing pollen | 10 |
| 2. | Prepare processing equipment | 10 |
| 3. | Process pollen | 10 |
| 4. | Perform post processing procedures | 10 |
| **Total** | | **40** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare materials for processing pollen | * 1. 1.1 Identification of materials for processing pollen   2. 1.2 Assembling materials for processing pollen   3. 1.3 Sorting materials for processing pollen | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Prepare processing equipment | * 1. Identification of processing equipment   2. Assembling of processing equipment   3. Setting up processing equipment   4. Safety and hygiene measures in pollen processing | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process pollen | * 1. Collection of pollen from pollen traps/combs   2. Sorting of pollen   3. Drying conditions for pollen   4. Storage conditions for pollen   5. Storage tools and equipment   6. Storage procedure for pollen | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Perform post processing procedures | * 1. Identification of packaging and labelling material and equipment   2. Sourcing packaging and labelling material and equipment   3. Procedure for packaging and labelling pollen   4. Management and disposal of waste | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Pollen
* Pollen trap
* Combs
* Spatulas
* Packaging and labelling materials and equipment
* Sensitive weigh scale/balance

## BEE VENOM PROCESSING

**UNIT CODE:** 0811 341 06 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: process bee venom

**Duration of Unit: 30** hours

**Unit Description**

This unit specifies the competencies required to process bee venom. It involves preparing materials for processing bee venom, preparing processing equipment, processing bee venom and performing post processing procedures.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare materials for processing bee venom | 10 |
| 2. | Prepare processing equipment | 5 |
| 3. | Process bee venom | 5 |
| 4. | Perform post processing procedures | 10 |
| **Total** | | **30** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare materials for processing bee venom | * 1. 1.1 Meaning of the term bee venom   2. 1.2 Properties of bee venom   3. 1.3 Composition of bee venom   4. 1.4 Uses of bee venom   5. 1.5 Uses of anti-venom   6. 1.6 Types of anti-venom   7. 1.7 Identification of processing materials for processing bee venom   8. 1.8 Assembling processing materials for processing bee venom   9. 1.9 Sorting processing materials for processing bee venom | * Written test. * Observation * Third party report * Oral questioning * Interviews |
| 1. Prepare processing equipment | * 1. Selection of the method of processing   2. Identification of processing equipment   3. Assembling of processing equipment   4. Setting up the processing equipment   5. Safety and health measures in processing of bee venom   6. Risk involved in venom processing | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process bee venom | * 1. Safety precautions in bee venom processing   2. The procedure for processing bee venom   3. Storage conditions for bee venom   4. Storage tools and equipment for bee venom   5. Storage materials for bee venom   6. Procedure for storing processed bee venom | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Perform post processing procedures | * 1. Packaging and labelling material, equipment for bee venom   2. Procedure for packaging and labelling processed bee venom   3. Management and disposal of waste | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Packaging materials
* Source of DC electric current (6MV)
* Venom collector
* Processing equipment
* Strong colony
* PPE
* Storage vials
* Storage equipment
* Cold storage

## BEE PRODUCTS VALUE ADDITION

**UNIT CODE:** 0811 341 07 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Perform bee product value addition

**Duration of Unit:** 50 hours

**Unit Description**

This unit specifies the competencies required to perform bee product value addition. It involves preparing the equipment, materials and supplies for value addition, processing wax-based value-added products, processing honey-based value-added products and processing propolis-based value-added products. It also includes processing royal jelly-based value-added products, processing bee venom-based value-added products; packaging and storing value added bee products.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Prepare the equipment, materials and supplies for value addition | 10 |
| 2. | Process wax-based value-added products | 10 |
| 3. | Process honey-based value-added products | 5 |
| 4. | Process propolis based value added products | 5 |
| 5. | Process royal jelly-based value-added products | 5 |
| 6. | Process bee venom-based value-added products | 5 |
| 7. | Package, brand and market value added bee products | 10 |
| **Total** | | **50** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Prepare the equipment, materials and supplies for value addition | * 1. Meaning of term value addition.   2. Identification of bee products for value addition   3. Equipment’s and materials used for value addition   4. Procedure for setting up equipment’s and materials for value addition | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process wax-based value-added products | * 1. Types of wax-based value-added products and their uses.(candles, soap, body cream)   2. Benefits of wax-based value-added products   3. Methods of preparing wax-based value-added products   4. Waste disposal | * + Written test   + Observation   + Third party report   + Oral questioning   + Interviews |
| 1. Process honey-based value-added products | * 1. Types of honey-based value-added products (vinegar, honey wine, cough syrup, body cream)   2. Benefits of honey-based value-added products   3. Methods of processing honey-based value-added products   4. Processing waste disposal | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process propolis based value added products | * 1. Types of propolis based value added products   2. Benefits of propolis based value added products   3. Methods of preparing propolis based value added products   4. Waste disposal | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process royal jelly-based value-added products | * 1. Types of royal jelly-based value-added products   2. Benefits of royal jelly-based value-added products   3. Methods of preparing royal jelly-based value-added products   4. Waste disposal | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Process bee venom-based value-added products | * 1. Types of bee venom-based value-added products   2. Benefits of bee venom-based value-added products   3. Methods of preparing bee venom-based value-added products   4. Waste disposal | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Package and store value added bee products | * 1. Types of packaging materials   2. Proper packaging of value-added products   3. Branding and labelling   4. Storage conditions   5. Storage of tools and equipment | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Bee products
* Packaging equipment
* Honey extractor
* Uncapping knife
* Packaging moulds
* Thermometer
* Processing, straining and settling tanks
* Packaging materials
* Bottles and jars
* Labels
* Weighing scales
* Perfumes
* Buckets
* Medicinal plants
* Vegetable oils
* Hand towels
* Refractometer

## BEE PRODUCT QUALITY CONTROL

**UNIT CODE:** 0811 341 08 A

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Control quality of bee products

**Duration of Unit: 50** hours

**Unit Description**

This unit specifies the competencies required to control quality of bee products. It involves establishing bee products safety and quality systems, managing quality operations, preparing for raw material and product analyses and carrying out raw material, packaging materials and finished products analyses.

**Summary of learning outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Establish food safety and quality systems | 10 |
| 2. | Manage quality operations | 10 |
| 3. | Prepare for bee product analyses | 10 |
| 4. | Carry out bee products analyses | 20 |
| **Total** | | **50** |

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Establish bee products safety and quality systems | * 1. Legal issues related to food handling   2. Bee products safety and quality systems   3. Designing and establishing bee product safety and quality systems   4. Setting up workplace Standard Operating Procedures (SOPs)   5. Documentation of food quality and safety procedures | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Participate in quality operations | * 1. Identification and mobilization of operational resources   2. Development of work schedules for quality operations   3. Organization and coordination of quality operations   4. Staff welfare /personal public health   5. Phytosanitary measures   6. Monitoring and evaluation of quality operations   7. Development of quality/safety management system   8. Emerging trends in food quality and inspection   9. Plant maintenance   10. Integrated pest and rodent management   11. Laboratory waste management and disposal   12. Internal quality auditing systems | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Prepare bee product analyses | * 1. Bee product analyses tools and equipment   2. Laboratory code of practice   3. Development of laboratory standards   4. Methods of sample collection   5. Sampling procedures   6. Development of laboratory standard operating procedures | * Written test * Observation * Third party report * Oral questioning * Interviews |
| 1. Carry out bee products analyses | * 1. Physical and chemical properties of bee product   2. Types of bee product analysis   3. Sample preparation   4. Interpretation and reporting of analyses results   5. Making decisions based on outcomes and workplace standards   6. Rejected product disposal | * Written test * Observation * Third party report * Oral questioning * Interviews |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

* Bee products
* Equipment
* Reagents
* Refractometer pipettes
* Standards manual
* Thermometer
* Distiller