****

**THE REPUBLIC OF KENYA**

**COMPETENCY-BASED MODULAR CURRICULUM**

**FOR**

**POULTRY HATCHERY OPERATIONS**

**KNQF LEVEL: 4**

**ISCED PROGRAMME CODE: 0811 354 A**

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# FOREWORD

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 Agriculture 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 upskilling.

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 Agriculture 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 Agriculture Sector acquire competencies to perform their work more efficiently and effectively.

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# ABBREVIATIONS AND ACRONYMS

|  |  |
| --- | --- |
| 2D | 2 Dimensional |
| 3D | 3 Dimensional |
| ATVET | Agricultural Technical and Vocational Education and Training |
| AU - IBAR | African Union – InterAfrican Bureau for Animal Resources |
| CAADP | Comprehensive Africa Agricultural Development Programme |
| CAD | Computer Assisted Drawing |
| CBET | Competency Based Education and Training |
| CDACC | Curriculum Development Assessment and Certification Council |
| CEO | Chief Executive Officer |
| DACUM | Develop a Curriculum |
| DVS | Director of Veterinary Services |
| EMCA | Environmental Management and Conservation Act |
| EMS | Environmental Management Systems |
| FSDRP | Food Security and Drought Resilience Programme |
| FSP | Food Security Project |
| GDP | Gross Domestic Product |
| GMP | Good Manufacturing Practices |
| HACCP | Hazard Analysis Critical Control Point |
| ICT | Information Communication Technology |
| IM | Intra Muscular |
| KCSE | Kenya Certificate of Secondary Education |
| KNQA | Kenya National Qualifications Authority |
| KNQF | Kenya National Qualifications Framework |
| KSPCA | Kenya Society for the Care and Protection of Animals |
| MAP | Modified Atmosphere Packaging |
| MoALF&I | Ministry of Agriculture, Livestock, Fisheries and Irrigation |
| MoE | Ministry of Education |
| NCA | National Construction Authority |
| NEMA | National Environmental Management Authority |
| NEPAD | New Partnerships for African Development |
| NGO | Non-Governmental Organization |
| NPCA | NEPAD Planning and Coordinating Agency |
| OIE | World Organization for Animal Health |
| OS | Occupational Standard |
| OSH | Occupational Safety and Health |
| PPE | Personal Protective Equipment |
| PSSAC | Poultry Sector Skills Advisory Committee |
| SOP | Standard Operation Procedures |
| 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

Poultry Hatchery Operations Level 4 qualification consists of competencies that an individual must have to operate hatchery. It involves handling of eggs for hatching, hatching poultry eggs and handling hatched chicks.

The units of learning comprising Poultry Hatchery Operations Level 4 qualification include:

|  |  |  |  |
| --- | --- | --- | --- |
| **ISCED Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| **MODULE I** | | | |
| 0811 351 01 A | Handling of Eggs for Hatching | 110 | 11 |
| 0811 351 02 A | Hatching poultry eggs | 100 | 10 |
| 0811 351 03 A | Handling Hatched Chicks | 170 | 17 |
| Industrial Attachment | | 320 | 32 |
| **Grand Total** | | **700** | **70** |

**Entry Requirements**

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

1. Kenya Certificate of Secondary Education (KCSE) mean grade E;

**Or**

1. Any equivalent qualifications as determined by relevant regulatory body

**Trainer Qualifications**

Qualifications of a trainer for this course include:

1. Possession of Poultry Production Level 5 or level 5 in related trade area; and
2. License by TVETA

**Industry Training**

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

**Assessment for level 4**

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 Poultry Hatchery Operations Level 4, the candidate must demonstrate competence in all the Units of Competency as given in the qualification pack. Statement of Attainment certificate may be awarded upon demonstration of competence in certifiable element within a unit.

These certificates will be issued by Qualification Awarding Institution

# HANDLING EGGS FOR HATCHING

**ISCED UNIT CODE:** 0811 341 01A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Handle Eggs for Hatching

**Duration of Unit:** 110 hours

**Unit Description**

This unit specifies the competencies required to handle eggs for hatching. It involves grading of eggs for hatching, storage of fumigated eggs and entry of hatchery records.

**Summary of Learning Outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Grade eggs for hatching | 50 |
| 2. | Store fumigated eggs | 40 |
| 3. | Enter hatchery records | 20 |
| **Total** | | **110** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Grade eggs for hatching | * 1. Personal protective equipment      1. Overalls      2. Gumboots      3. Nose and mouth mask      4. Goggles      5. Gloves      6. Head gear   2. Hatching eggs handling      1. Egg reception      2. Traying      3. Loading   3. Grading/sorting of eggs   4. Standard conditions of hatching eggs   5. Inspection   6. Disposal of rejected eggs | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Store fumigated eggs | * 1. Hatchery biosecurity measures   2. Egg fumigation   3. Egg storage      1. Storage materials      2. Storage conditions      3. Storage duration   4. Waste management | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Enter hatchery records | * 1. Egg parameters recordings   2. Egg numbers (received, sorted, rejected, brocken and stored)   3. Egg weight / size / shape   4. Type of eggs (Breed / species) | * Written tests * Observation * Oral questions * Third party report * Interviewing |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Field trips
* Discussions
* Direct instruction
* Electronic audio-visual presentations
* Simulations

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| Functional hatchery farm with the following: | | |
| * Hatchery unit * Biosecurity structures and materials (gate barriers, foot baths, spray races / showers, disinfectants, sanitizers, detergents, fumigants, water and vaccination kits) | * Labels or labelling materials for egg trays, trolleys, chick baskets and packaging material * Stationery * Calculators and / or computers | * Hatchery pest and predator control equipment and materials * Hatchery operations manuals * Livestock production manuals * Journal of poultry science |

# HATCHING POULTRY EGGS

**ISCED UNIT CODE:** 0811 341 02 A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Hatch Poultry Eggs

**Duration of Unit:** 100 hours

**Unit Description**

This unit specifies the competencies required to hatch poultry eggs. It involves setting poultry eggs, monitoring egg hatching, transfer of hatched chicks and entry of hatchery records.

**Summary of Learning Outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
| 1. | Set poultry eggs | 30 |
| 2. | Monitor egg hatching | 30 |
| 3. | Transfer hatched chicks | 30 |
|  | Enter hatchery records | 10 |
| **Total** | | **100** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Set poultry eggs | * 1. PPE      1. Overalls      2. Gumboots      3. Nose and mouth mask      4. Goggles      5. Gloves      6. Head gear   2. Hatchery Biosecurity measures   3. Hatching egg handling regulations      1. Hand sanitization or wearing gloves whenever handling eggs      2. Free from communicable diseases      3. Handling eggs with care      4. Avoiding wetting the eggs   4. Egg structure   5. Egg retrieval from cold storage   6. Egg traying room   7. Setting trays   8. Setting troleys   9. Egg setting   10. Setting position (vertical with broad ends up)   11. Incubation chamber parameters (temperature and humidity)       1. Turning mechanisms, angles and frequency       2. Duration of setting       3. Power outage and back up options | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Monitor egg hatching | * 1. Egg incubation periods of poultry   2. Hatching dates   3. Removal from hatching trays   4. Egg candling      1. Infertile eggs      2. Dead in shell embryos      3. Exploders   5. Transfer to hatching baskets   6. Hatching position (horizontal)   7. Hatching machines   8. Transfer to hatching machine   9. Chick hatching process      1. Hatching parameters (temperature, humidity and CO2 concentrations)      2. Pipping / shell cracking      3. Hatch window (duration)      4. Hatching indicators (amount of fluff, chick noises) | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Transfer hatched chicks | * 1. Chick transfer   2. Basket pulling   3. Chick separation from debris   4. Chick sorting – sorting criteria   5. Unhatched eggs   6. Stages of embryonic deaths (dead in shell, pipped)   7. Causes of embryonic deaths   8. Remedial measures to minimise the embryonic deaths   9. Disposal of hatchery wastes | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Enter hatchery records | 1. Incubation parameter recordings 2. Power outages 3. Egg parameters (numbers incubated, candled, rejected, hatched, type of eggs, breed) 4. Batch numbers, flock, dates of incubation, candling hatching and transfer) | * Written tests * Observation * Oral questions * Third party report * Interviewing |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Field trips
* Discussions
* Direct instruction
* Electronic audio-visual presentations
* Simulations

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| Functional hatchery farm with the following: | | |
| * Hatchery unit * Biosecurity structures and materials (gate barriers, foot baths, spray races / showers, disinfectants, sanitizers, detergents, fumigants, water and vaccination kits) * Labels or labelling materials for egg trays, trolleys, chick baskets and packaging material * Stationery * Calculators and / or computers | * Hatchery equipment and tools (fumigators, sprayers, refrigirators, hatching machines, setters / incubators, candling machines, egg crates and trays, egg trolleys, hatching baskets, chick boxes, chick labels, identification kits, macerators and renderers, gas cylinders, vacuum cleaners) | * Hatchery pest and predator control equipment and materials * Hatchery operations manuals * Livestock production manuals * Journal of poultry science * Chick feed * Feed stores |

# HANDLING HATCHED CHICKS

**ISCED UNIT CODE:** 0811 351 03 A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Handle Hatched Chicks

**Duration of Unit: 170** hours

**Unit Description**

This unit specifies the competencies required to handle hatched chicks. It involves performing chick sexing, trimming chick beaks, monitoring chick health, packaging poultry chicks and managing unwanted chicks. It also entails managing hatchery biosecurity measures and maintaining hatchery records.

**Summary of Learning Outcomes**

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

|  |  |  |
| --- | --- | --- |
| **S/No** | **Learning Outcomes** | **Duration (Hours)** |
|  | Perform chick sexing | 30 |
|  | Trim chick beaks | 20 |
|  | Monitor chick health | 30 |
|  | Package poultry chicks | 30 |
|  | Manage unwanted chicks | 20 |
|  | Mange hatchery biosecurity measures | 30 |
|  | Maintain hatchery records | 10 |
| **Total** | | **170** |

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

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Perform chick sexing | * 1. Sexing of poultry      1. Vent sexing      2. Initial relative feather length      3. Plumage colour sexing      4. Combs and wattles sexing   2. Factors considered in separation of poultry into different sexes | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Trim chick beaks | * 1. Beak trimming equipment   2. Beak trimming procedure | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Monitor chick health | * 1. Factors considered when developing chick vaccination schedule      1. Disease prevalence      2. Duration of immunity (lifetime or partial)      3. Disease severity      4. Economic importance   2. Types of vaccines (live attenuated, inactivated, vectored/recombinant)   3. Vaccine handling   4. Refrigeration methods   5. Record keeping   6. Vaccination sites and routes   7. Vaccine intake   8. Animal welfare regulations   9. Chick handling   10. Recording vaccination details       1. Type of vaccine       2. Type of disease vaccinated against       3. Age of poultry   11. Date and time of vaccination   12. Date of manufacture and expiry of vaccine   13. Vaccine source and batch number   14. Route of chick vaccine administration (IM, sub-cutaneous, intra nasal, intra ocular or spray, follicular swabbing, drinking water application, scarification)   15. Number of birds vaccinated   16. Identification of birds (flock, type, breed)   17. Signs of disease in chicks   18. Isolation of sick chicks | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Package poultry chicks | * 1. Chick packaging materials      1. Types (cartons, carton liners etc)      2. Labelling      3. Loading capacities   2. Chick transportation      1. Transportation conditions (Temperature, humidity, air speed)      2. Transportation duration   3. Poultry welfare   4. Dispatch methods and procedures      1. Order processing      2. Distribution channels | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Manage unwanted chicks | * 1. Categories of unwanted chicks      1. Culled chicks      2. Unhealthy chicks      3. Deformed chicks      4. Males in commercial layers   2. Chick sorting   3. Modes of disposal | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Maintain hatchery biosecurity measures | * 1. Biosecurity in a poultry hatchery firm      1. Measures      2. Standard operational procedures (SOPs)      3. Regulatory bodies   2. Designing biosecurity structures and equipment installation   3. Occupational safety and health procedures in poultry hatchery firm   4. Hatchery firm waste management      1. Eggs unsuitable for hatching      2. Hatchery debris (fluff, egg shells, unhatched eggs)      3. Dead chicks      4. Litter (droppings, feathers, spilt feed)   5. Other wastes (plastics, glass, paper, metals and fluids)   6. Environment protection regulations   7. Hatchery operations licensing | * Written tests * Observation * Oral questions * Third party report * Interviewing |
| 1. Maintain hatchery records | * 1. Poultry hatchery chick records   2. Number of chicks hatched, vaccinated, sexed (males and females), dead, deformed, weaklings,   3. Health records – vaccination   4. Dispatch records – orders, dates, numbers (chicks)   5. Data entry, analysis and interpretation   6. Frequency of recording   7. Record maintenance (updating and storage) | * Written tests * Observation * Oral questions * Third party report * Interviewing |

**Suggested Methods of Instruction**

* Project
* Demonstration by trainer
* Practice by the trainee
* Field trips
* Discussions
* Direct instruction
* Electronic audio-visual presentations
* Simulations

**Recommended Resources**

|  |  |  |
| --- | --- | --- |
| Functional hatchery farm with the following: | | |
| * Hatchery unit * Biosecurity structures and materials (gate barriers, foot baths, spray races / showers, disinfectants, sanitizers, detergents, fumigants, water and vaccination kits) * Labels or labelling materials for egg trays, trolleys, chick baskets and packaging material * Stationery * Calculators and / or computers | * Hatchery equipment and tools (fumigators, foggers/sprayers, refrigirators, hatching machines, setters / incubators, candling machines, egg crates and trays, egg trolleys, hatching baskets, chick boxes, chick labels, identification kits, macerators and renderers, gas cylinders, vacuum cleaners) | * Hatchery pest and predator control equipment and materials * Hatchery operations manuals * Livestock production manuals * Journal of poultry science * Chick feed * Feed stores |
| * 25 Desktop computers/laptops | 25 mobile phones | Flashcards |
| * Internet connection | Telephone | Flip charts |
| * 1 Projector * 1 Printer |  | 2 packets of assorted colors of whiteboard marker pens |