POULTRY

TRAINING MANUAL

K'FUYA

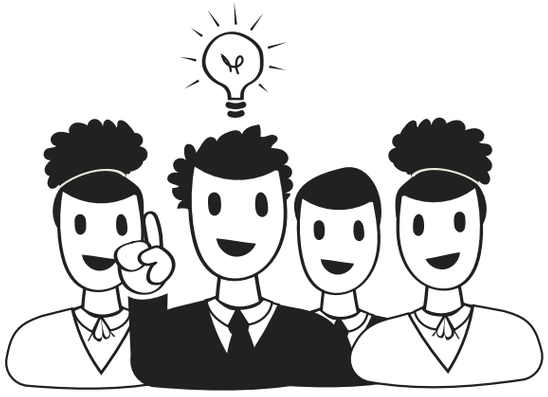
CROSSROADS INTERNATIONAL

Solidaridad

CONTENTS

1 TRAINER/ FACILITATOR'S APPROACH

1. OVERVIEW



Two basic considerations were used in producing this training material:

A. EXPERIENCE AND KNOWLEDGE

This course is meant for adults. Adults have their own experience and knowledge and they want to be treated with respect. Their time is limited, because they have many other commitments. Adults choose to follow a course if they feel that the course contents are relevant and useful to them. Therefore, the manual has been built step by step on the **experience and knowledge of adult learners**.

B. PARTICIPATORY APPROACH

Adults learn best when they participate actively in a learning process. The **participatory approach** was therefore used as a guideline throughout the course. Each lesson has a number of steps to encourage participation through discussion, small group exercises, role-plays and individual exercises.v

2 GUIDELINES FOR USING THIS MANUAL

2.1. CONTENTS OF THE LESSONS

Each lesson begins with a short introduction to the subject.

> STEP 1: DISCUSSION

The discussion in a lesson is a way to make the participants think about the problems and objectives of that particular lesson and to relate the topic to their own experience and knowledge. Questions are provided to give a guideline for these discussions or open up new thinking about an issue; give the participants time to think about the questions, and show respect for their answers. Allow for discussion between participants. Most questions are immediately followed by a possible answer. These answers are given to help you to guide the discussion, but they should not be considered as the only correct answer.

> STEP 2: EXPLANATION

After the discussion, explain the topic of the lesson including questions raised during the discussion in Step 1 and all the details not explained so far. Step 2 should clearly indicate what the participants will learn during this lesson.

> STEP 3: EXAMPLES

The examples in the manual are given to illustrate the topic and to relate it to participants' daily situations. Discuss the examples with the participants. You may also decide to alter some of the examples to suit the particular situation of your participants, or add extra examples that are more relevant to the local situation.

> STEP 4: PRACTICE

The practice includes small group exercises, role-plays, discussions, individual exercises and homework to ensure that the participants will actually practice how to use their new knowledge in their own work and life.

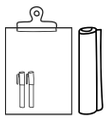
Participants should work as much as possible in groups of two to three persons to learn from each other. Try to change the composition of the groups as frequently as possible. In this way, slow learners can benefit from the help of fast learners, and fast learners avoid getting bored.

> STEP 5: CONCLUSION

Each lesson finishes with a number of questions or an activity to make sure that everybody has understood the lesson. If you find out that the participants have problems with some of the issues, you may have to do more exercises, and try to explain it in a different way. You may also ask some of the fast learners to spend some time helping the slow learners.

2.2. MATERIALS

- A chalkboard, chalk and a cleaning rag,



- Flip charts or newsprint and felt pens,

- Simple arithmetic exercise manuals for all participants,

- Pencils, pens, rulers and erasers for all participants.

FACILITATORS NOTES: The manual contains pictures, drawings and charts where necessary. These can easily be drawn on the chalkboard or on large sheets of paper. Organise and prepare the training materials well ahead of your training sessions.

2.3. TIME

The duration and delivery of each session should consider the fact that adult participants are not used to concentrating for a long time. Repetition is very important to a successful course.

2.4. VENUE

The training can be given anywhere, in the courtyard of one of the participant's homes, under a tree, in a classroom, in a community centre or wherever it is convenient for the participants and not too far away from their homes. Try to avoid the lessons becoming too much of a 'public affair' with bystanders watching. The participants should be able to feel at ease and not be distracted by remarks from people not attending lessons.

2.5. LANGUAGE

While the manual is written in English, the training can best be given in the local language of the participants.

2.6. PREPARATION

Prepare yourself before each meeting. Read the lesson, prepare and be familiar with the exercises and their respective requirements. This will make it easier for you to lead the discussions and it will save time during the lessons.

2.7. SUGGESTED TRAINING METHODS

The following are the suggested training methods recommended for this manual, make a careful note of the points you need to watch in using each of these methods:

> LECTURE

WHAT IS IT?

A lecture incorporates different techniques that involve participation such as the questions you ask and the partcipants' answers, their questions to you and your answers as well as brief periods of open discussions in between the points you make.

WHEN TO USE IT?

Lecture method is ideally used to explain or introduce concepts and principles that the participants are not familiar with and to provide related information.

WHAT IT WILL ACHIEVE?

The lecture method helps participants to gain knowledge through shared, brief, focused discussions.

ADVANTAGES?

The lecture session can be well structured beforehand. The timing for the session can therefore be worked out accurately.

DISADVANTAGES?

Participation can be limited and therefore keeping the participants' interest alive is difficult. The assimilation of knowledge by the participants could therefore be restricted.

POINTS TO CONSIDER:

The lecture must be made adequately participative by asking leading questions and inviting the participants to think actively and respond. Participants have an opportunity to be involved but if they are not, the communication will be only one way and the session may not achieve its objective. When you ask questions, only a few participants may be inclined to provide answers and others may take the role of passive listeners. In this case, the participation will be low and passive listeners may not learn much. Avoid such a situation and always encourage everyone to participate fully.

Similarly, only a few participants may ask questions. Others may have questions but may be embarrassed or shy to ask. Always encourage every participant to ask questions and answer every question even though it may be a repetition.

BRAINSTORMING

WHAT IS IT?

Brainstorming is a training method used to generate ideas. Its objective is to stimulate participants into finding different ways to address a given problem. You pose a problem or a question which can be tackled in a number of different ways and ask the participants to think of such different ways. For example, in the 'marketing' session, you can ask the participants to brainstorm on ways to market their products. The objective of brainstorming is to produce a list of alternative solutions/answers and then subsequently discuss the merits and demerits of each solution.

WHEN TO USE IT?

Brainstorming is ideally used to find a practical solution to a problem. In training, it is also used to help participants learn by building on their experiences. As a training method brainstorming is used when participants have ideas about how the particular problem can be solved.

WHAT IT WILL ACHIEVE?

The participants learn by building on their experiences. Furthermore, they learn to choose from alternative solutions.

ADVANTAGES?

Brainstorming produces a high degree of participation. It also makes the session livelier and it stimulates creative thinking.

POINTS TO WATCH?

During brainstorming, the focus should be on generating ideas and not on discussion of ideas. Focus your attention on getting as many ideas as possible. Make sure everyone participates by asking those who are quiet for ideas. No critical remarks should be allowed. Evaluation of ideas comes later.

DISCUSSION (OPEN & GROUP)

WHAT IS IT?

Knowledge, ideas and opinions on a particular subject are freely exchanged among the participants and the trainer. There are two types of discussions: open and group. In open discussion, the trainer facilitates and controls the discussion while everyone participates. In group discussions, the participants are divided into small groups. Each group freely discusses the subject. The trainer circulates among the groups as an observer and makes appropriate inputs wherever whenever necessary. The groups then come back together then present their deliberations. After this, all the presentations are discussed in an open forum.

WHEN TO USE IT?

Discussion is ideally used to analyse a given situation and reinforce the concepts and understanding of the participants through exchange of views with others. It is used when participants have background knowledge of the issue.

WHAT IT WILL ACHIEVE?

Discussion brings about changes in the attitudes of participants as they share experiences.

ADVANTAGES:

The discussions provide feedback to the trainer about the way in which the participants may apply the knowledge learned.

DISADVANTAGES:

The participants may stray from the subject or fail to discuss it usefully.

POINTS TO WATCH:

Participants may become stubborn and determined to stick to their attitudes and/or opinions rather than be prepared to change them. You need to control the structure, direction and process of discussion to avoid these pitfalls.

> GROUP EXERCISE

WHAT IS IT?

Participants are asked to undertake a particular task, which requires results. An exercise is a practice or a test of knowledge already learned. It may be done in small groups or individually. Since the level of absorption of knowledge varies from person to person, a group exercise helps to reinforce the knowledge through peer instructions.

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WHEN TO USE IT:

An exercise is used after the participants have learned a specific piece of knowledge or after a topic has been covered.

WHAT IT WILL ACHIEVE:

An exercise is an active form of learning as participant's practice the techniques taught to them and apply the knowledge learned to get solutions. Exercises also help the trainer to find out how much they have absorbed.

POINTS TO WATCH:

Some participants may struggle during exercises. Do not, however, provide them with solutions; rather give appropriate hints and tips only.

> CASE STUDY

WHAT IS IT?

A case study is a brief history of an event or a set of circumstances with appropriate details that participants need to examine and understand. They are then required to analyze and diagnose the causes of a particular problem (or problems) set out in the case study. They may further be required to solve the problems.

WHEN TO USE IT:

A case study is ideally used to demonstrate the application of various techniques in the real life situations which participants are likely to face.

WHAT IT WILL ACHIEVE:

A case study simulates situations which participants may face in their day-to-day business dealings. It therefore prepares them to face similar or related situations in real life.

ADVANTAGES:

Case studies help participants to look at a problem or set of circumstances free from the pressures of the actual problem event. It provides opportunities for exchange of ideas and generation of alternative solutions to problems which they might face in their businesses.

DISADVANTAGES:

In real life, the situations/events will differ from those set out in case studies. The participants may get the wrong impression of real life situations.

POINTS TO WATCH:

You need to emphasize that decisions taken in the training situation may differ from those, which have to be made on the spot in real life situations.

> ROLE-PLAY

WHAT IS IT?

A role-play is a dramatization of what may happen in real life situations. Participants are asked to enact specific roles in a given situation. The objective is to practice dealing with face-to-face situations in real business life. All participants in an open forum to bring out how the situations could be dealt with differently followed by a discussion of the dramatized event.

WHAT IT WILL ACHIEVE:

Participants practise near-to-life situations in a protected training environment and receive advice or constructive criticism and opinions from their colleagues. This helps participants to learn the finer points through practice and to obtain guidelines on how to react appropriately in real life.

ADVANTAGES:

Role-play helps give the participants confidence in facing actual business situations. A role-play can also add variety and fun to learning.

DISADVANTAGES:

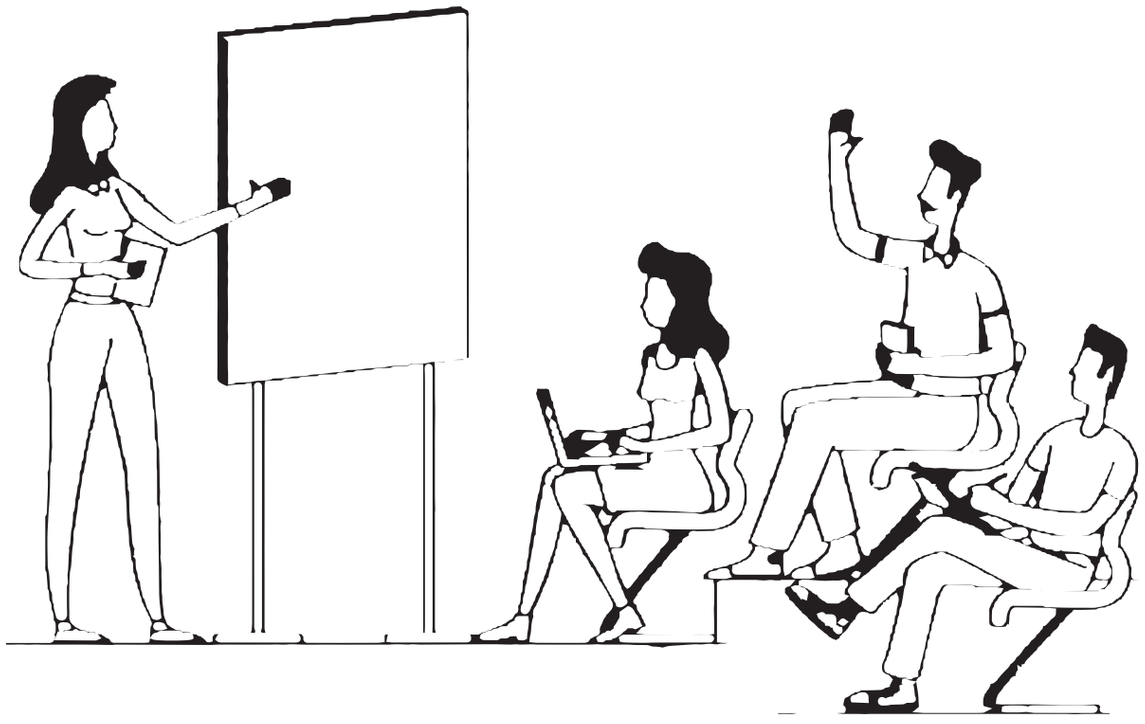
Real life events may differ from those set out in the role-play. Participants may get the wrong impression and fail to realize that decisions taken in the training are different from those made on the spot in a real situation.

POINTS TO WATCH:

Participants may be embarrassed and their confidence may diminish rather than being built up. Some participants may be carried away in enacting their roles, making the whole role-play look like a farce, which may not be taken seriously. You need to moderate the role-play to avoid this happening.

1.3 FACILITATORS OUTLOOK

This paragraph will illustrate what is expected from you and what you can expect from the participants.



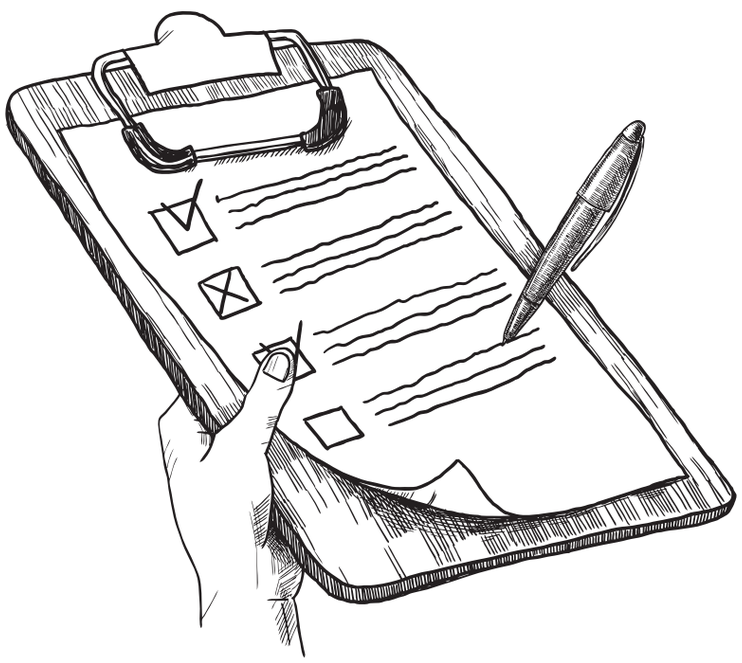
WHAT YOU SHOULD REMEMBER ABOUT THE PARTICIPANTS:

1. The participants are adults and not children, therefore treat them with respect, as you would do with your elders;
2. The participants have experience in life and are intelligent. There are many things they do not need to be told because they already know them. They have experience and they can reason.
3. The participants have many responsibilities and commitments outside the course. During the lessons they may be tired from having completed a day's work and these commitments may still occupy their minds. Consequently they may be slower in learning and they may have a tendency to forget more easily;
4. Most of the participants have families to maintain as well as other financial commitments to meet. This makes them material minded and interested in the relevance of what they learn during the lessons for their daily life. Therefore the participants will respond more readily to practical examples relating to their daily work then to abstract examples.

WHAT IS EXPECTED FROM YOU AS THE FACILITATOR:

1. Treat your participants as adults, show respect, be patient, and use examples from their own experience as much as possible;
2. You are a facilitator, not a teacher. A teacher assumes that the 'children' do not know anything. A facilitator works with adults who already have a lot of knowledge. He/she attempts to get to know the situation and problems of the people and shows understanding. The facilitator tries to make the people think about their own situation and about ways to solve their problems;
3. The lessons should be given in the local language;
4. Organise your lessons and prepare your teaching materials well ahead. This will save time during the lessons and make it easier for you to discuss the topics with your participants.
5. Look out for people with poor eyesight and if necessary seat them closer to the chalkboard;
6. Not all participants will understand the lessons with the same speed. Take time to explain all topics thoroughly and repeat examples and exercises regularly. On the other hand, be aware that extreme slowness of some of the participants may create an uneasy atmosphere in the group. It may hinder the progress of the group and it can cause a certain lassitude among the others. It is important to carefully choose the pace of the lessons or you might 'loose' learners. If necessary give extra lessons to those who are much slower in understanding.
7. Be in time for the lessons and inform the participants if you are not able to come. Remember that your behaviour will set an example for your participants' behaviour!

1.4 EVALUATION



Evaluation is used as a tool to find out how the training course is progressing. It will help you to know what your participants like and dislike about the course, what they have learned and understood, and what they find difficult. By doing regular evaluation you will know where you will have to improve your lessons, so that the training course will be successful.

During the evaluation, you may want to ask the participants questions like:

- What did you learn so far?
- What did you find easy?
- What did you find difficult?
- How can you use what you have learned so far in your own business?

You may also want to find out how the participants feel about the group and about your way of teaching. Evaluation can be carried out by way of a plenary discussion with the participants, home-visits or written exercises. The tests that are included in some of the lessons will also give you an idea of whether the participants have understood the lessons. If you conclude that, there is a difference in the level of understanding, team up better and slower learners. Ask those who are more advanced than the others to explain the difficult issues.

2 FARMER-FACING PROGRAMME INDUCTION

2.1 PROGRAMME INTRODUCTION

DURATION	1 hour
METHODOLOGY	presentation/group discussion/Q&A Engagements
REQUIRED MATERIALS	• Flip chart and markers (for the value chain illustration) • Visual Aid

2.1.1. PREPARATION

1. This first session is important for creating a conducive atmosphere for the participants. Be attentive, responsive to the farmers' needs and flexible in reorganising the training.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.

2.1.2. LEARNING OBJECTIVES

By the end of the session, farmers should be able to:

1. Understand the Programme's Objective
2. Know about the implementers and partners attached to the programme
3. Know how to become a Solidaridad recognised farmer & the benefits attached
4. Understand the poultry value chain
5. Be clear on how the programme will empower you

2.1.3. SESSION PLAN

TIME	CONCEPT	KEY POINTS	METHOD
MINUTES	The objective of the lesson	Induction	Lecture & Discussion
20 MIN	**PART A** Programme Introduction	• About Programme • The importance of poultry production • About Partners • Programme Objectives • Sustainability • How to become a Solidaridad farmer • Q & A	• Lecture (10 minutes) • Q & A Engagement (10 minutes)
40 MIN	**PART B** Programme Introduction	• Aligning expectations • What is entrepreneurship? • Poultry Value Chain • What does Success look like	• Group discussion (10 minutes) • Lecture (10 minutes) • Lecture (10 minutes) • Q & A Engagement (10 min)

PART A: PROGRAMME INTRODUCTION

LECTURE

> ABOUT THE PROGRAMME

The K' fuya poultry programme implemented by Solidaridad works with over 30,000 soy and maize farmers in Angonia and Gurue in Mozambique, Zambia (Katete). These farmers are successfully producing crops. There is growing demand for opportunities to convert the plant protein into a higher value animal protein and so add value to the local production chain.

K'fuya is currently working with up to 1000 farmers who have access to poultry production inputs(Day Old Chicks, Feed, Vaccines), technical support, profitable markets and sustainable production practices.The project aims to add value to crops and increase incomes and nutrition diversity among crop farmers.

> THE IMPORTANCE OF POULTRY FARMING

Most smallholder farmers, including the lowest income ones, keep some chickens. Chickens are often essential with female-headed and HIV/AIDS-affected households because of the low investment cost.

The importance of poultry farming is:

IMPROVED INCOMES

from the sale of chickens (meat), growers (teen birds), eggs. These sales may be throughout the year and not seasonal as with crops.

FOOD SECURITY

Eggs and meat are invaluable foods, especially for young children to grow strong and healthy. They are rich in protein, vitamins and minerals (essential nutrients). These are particularly important during pregnancy and infant growth.

MANURE

Poultry produces excellent fertiliser for gardens, especially for growing vegetables suitable for a balanced diet

> ABOUT THE PARTNERS:

SOLIDARIDAD

Solidaridad

Solidaridad Southern Africa is one of the regional offices that form part of the Solidaridad global Network. Working in 5 countries across the region (South Africa, Zambia, Mozambique, Malawi & Zimbabwe), with a special focus on 5 primary commodities (soy, sugarcane, cotton, fruit & Veg and livestock) and 4 secondary commodities (aquaculture, cotton, tea and bio-ethanol), Solidaridad is bringing "Change That Matters" in the lives of farmers and some of the region's most significant value chains.

HENDRIX GENETICS (SUSTAINABLE ACCESS TO POULTRY PARENT STOCK IN AFRICA)

HENDRIX GENETICS

Hendrix Genetics (Sustainable Access to Poultry Parent Stock in Africa) through local partners Heartlands (Zambia), Novos Horizontes (Mozambique).

FARMFEED LIMITED, ZAMBIA

Farmfeed Limited
"Adding value to Zambian crops through livestock"

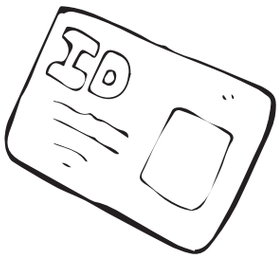
Farmfeed Limited, Zambia, for stockfeed solutions will see farmers mix their own feeds on farms adding value to their crop produce.

> PROGRAMME OBJECTIVES:

1. To create sustainable incomes for smallholder farmers to reduce the effects of poverty.
2. To Increase access to protein in rural communities.
3. Gender empowerment through establishing women and youth-led poultry enterprises

> HOW TO BECOME A SOLIDARIDAD RECOGNISED FARMER:

Every farmer must be given a farmer ID for them to a recognised Solidaridad Framer



WHAT IS THE PURPOSE OF A FARMER ID?

The farmer ID, like a National ID, is a unique identifier. It allows us to identify each farmer and monitor their progress as they adopt some of the Good Agricultural Practices. Often people in an area share the same name. In addition, there could be a spelling mistake in someone's name, which could lead us to think that they are a new farmer. The farmer ID allows us to remove all uncertainty because it is unique to the particular farmer and belongs ONLY to that farmer.

HOW DOES IT WORK?

On registration, the farmer is issued with a farmer ID. The farmer ID consists of an alphanumeric sequence and a QR code. The QR code is then scanned during all Solidaridad activities to register the farmer's participation in training as well as their infield adoption. Farmers need to protect their farmer ID from physical damage and getting lost.

HOW WILL IT BENEFIT THE FARMER?

The farmer ID will allow us to support the farmer by providing accurate information to enable customise extension services. This means that our interventions can be tailored to the specific farmer's needs.

The farmer is also able to use their farmer ID for Solidaridad Wadi, our virtual assistant on WhatsApp, to access the following services:

- Weather forecasts based on the location of their field
- Request soil testing
- Access training content

The farmer participating in the Kvuno Circles programme (available in Angonia, Gurue and Katete) will also earn points for recording their farming practices. You can redeem these points for rewards through the Z'wardy rewards programme.

FACILITATORS NOTES: To end this session, please have a Q & A to clarify any confusion or concerns that farmers might have. Please take a 5 min break group if need be.

PART B: PROGRAMME INTRODUCTION

DISCUSSION

The Facilitator is to pose a series of guiding questions to the training group; these questions serve to establish alignment between the individual's objectives and the programme objectives. People get into farming for different reasons, so let us find out why the farmers have chosen to be part of the programme.

- How did you get into farming/ how long have you been farming?
- How has farming positively affected your life?
- What are your hopes in being part of this programme?
- What are your immediate goals attached to your farming enterprise?
- How can we use farming as a vehicle to uplift our community?

FACILITATORS NOTES: Please take note of expectations that are a perfect fit to the programme and those that are misguided. You will have to correct and help realign them to the programme's deliverables.

LECTURE: UNDERSTANDING ENTREPRENEURSHIP

GUIDING QUESTION:
As farmers, do you think you are entrepreneurs?

There are many definitions of entrepreneurship. For example, entrepreneurship is a process of creating or seizing an opportunity and pursuing it, regardless of the resources currently controlled; and involves assuming the accompanying risks but also receiving rewards of monetary and personal satisfaction. Instead of focusing on the process, other people suggest that entrepreneurship is the act of initiating, creating, building and sustaining a venture, building an entrepreneurial team, and gathering the necessary resources to exploit an opportunity in the market place for long-term wealth and capital gain.

The Facilitator must emphasize that there are specific aspects of entrepreneurship that are evident in the above definitions. These are:

> **IDENTIFYING AN OPPORTUNITY**
This means there must be a real business opportunity

> **INNOVATION AND CREATIVITY**
Something new and different is required

> **GETTING RESOURCES**
Capital, labour and operating equipment must be found

> **CREATING AND GROWING A VENTURE**
Starting a new business venture or converting an existing one

> TAKING RISKS

This means there will be personal and financial risks involved for the person who embarks on the entrepreneurial process

> BEING REWARDED

A reward is an essential element of the free-market system. It can be in the form of profit or an increase in the business value.

> MANAGING THE BUSINESS

This means there must be planning, organizing, leading, and controlling of all the functions in the business venture.

FACILITATORS NOTES: Close off the session by asking the farmers which of the above have they done well in their farming enterprise, which have been a challenge, and how they plan to overcome this challenge.

LECTURE: UNDERSTANDING THE POULTRY VALUE CHAIN

The poultry value chain describes the full range of activities required to produce the birds and eggs to final consumers. The value chain identifies opportunities and constraints to increasing benefits for stakeholders operating throughout the chain.

> VITAL ACTORS OF THE VALUE CHAIN:

HATCHERY

Eggs are hatched under controlled conditions from the breeder farms and supplied to the Mother Unit farmers.

MOTHER UNIT

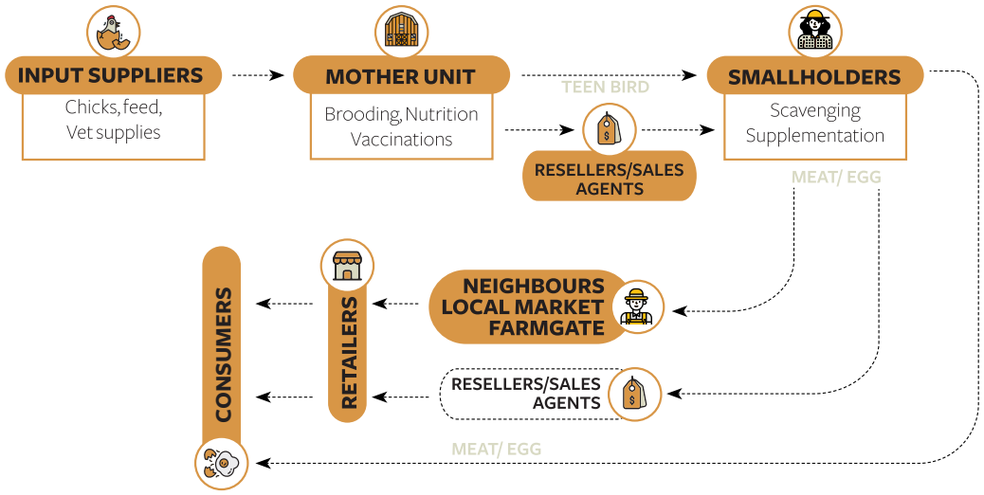
This is where the production starts. The mother unit will keep birds for the first 4-6 weeks to give them a healthy and vigorous start. At the end of this stage, the bird weighs approximately 1 kg, and we call it a teen bird.

SMALLHOLDER FARMERS

Either meat farmer/ egg farmer. They buy birds from the mother unit and keep the males until they are 12 weeks old (weigh 2.5-3Kg) and females until 80 weeks. Females start producing eggs at 25 weeks and lay up to 260 eggs per year for sale.

MARKETING

The primary actors in this value chain are mother/brooder units, smallholder farmers, hatchery, input suppliers, sales agents, and live bird traders.



> WHAT DOES SUCCESS LOOK LIKE, AT THE END OF THE PROGRAMME?

As Solidaridad, we serve to create an enabling environment for your success. While we cannot give farmers the dreams, what we can do is empower them so that they can access their dreams, increase their revenue and improve their livelihood.

What is the programme's promise to the farmers?

- Digitized supply chains for soybean farmers
- Input supply chain developed (inoculants, seed, and fertilizer)
- Farmers applying soybean sustainability principles
- Access to the weather-based index for planning and resilience
- Farmers accessing input finance products
- Farmers integrated into the poultry value chain
- Accessing Harvesting &PH technologies
- Soybean sold through structured market

FACILITATORS NOTES: As you close, make sure that you addressed any concerns or questions to their satisfaction. Please feel free to have further engagements beyond the training session should there be any lingering concerns.

Before ending the first session, tell the participants that as a facilitator of this intensive training, you would like to suggest some norms that will allow its effective implementation. Tell the participants that you have some suggested norms – which they must agree with, and add to. Put on a flip chart the following:

- Participation – make sure everyone has a chance to speak throughout the day, especially the quieter participants.
- Discipline – if someone wants to contribute a point, they must raise their hands; there should be no mini-meetings during the sessions
- Punctuality – everyone should be on time
- Managing the environment - keep cell-phones on silent for n the duration of the session; use acceptable language
- No unnecessary distractions – no de-tracking, keeping other comments limited

3 TECHNICAL TRAINING

MODULE 1: SITE SELECTION & HOUSING

DURATION	1h45 min
METHODOLOGY	Plenary/ Presentation/ Discussion
REQUIRED MATERIALS	• Flip chart and markers. • Fact sheets • Visual aids

PREPARATION

1. The facilitator should read and understand the training content before delivering it to farmers.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.
3. Engage in active listening
4. Ask for information and opinions in a way that gets relevant, honest and appropriate responses
5. Use and interpret non-verbal communication; facial expressions, body movements and physical contact
6. Provide constructive feedback to others

LEARNING OBJECTIVES

By the end of the session, farmers should be able to:

1. Select a proper site for the construction of their poultry house/brooder.
2. Design and construct an ideal poultry house with correct orientation and specifications.
3. Furnish the interior of the poultry house with the necessary equipment to allow birds a good environment

1. INTRODUCTION TO THE MODULE

A suitable chicken house is vital for the efficient production and management of birds.
It also contributes positively to disease control. Therefore, housing will determine the success or failure of the enterprise. A functional poultry house protects chickens against predators, thieves, adverse weather (rain, sun, cold winds, and low night temperatures) and provides shelter for egg-laying and broody hens. Chicken houses and shelters vary depending on the availability of construction materials, weather and traditions. The type of housing should be based on cost, durability and usage.

This module exposes farmers to the construction and equipping of chicken houses. The use of locally available construction materials and factors determining the type of house to be constructed are discussed

1.1. SITE SELECTION

A critical task in addressing housing is to select a proper site for the chicken house. In choosing the site for the chicken house, one should be guided by the following factors:

- The site should preferably be on level ground.
- The soil must be well-drained so that during rain, there is no waterlogging
- The area must have plenty of natural air movement to aid ventilation.
- The house should be oriented on an east-west axis to reduce the effect of direct sunlight on the sidewalls during the hottest part of the day.
- The objective here is to reduce the temperature fluctuation during any 24 hours.
- The ground must be big enough to accommodate the number of birds one wants to keep. This is guided by the stocking density of adult birds which should be 10 -12 birds per m2.

After identifying a proper site for the chicken house, one needs to design and construct the chicken house. A well-designed house will ensure that the chickens have maximum comfort and perform best, provided all other factors are favourable. A key to lowering the cost of the poultry house is using locally available materials

1.2. POULTRY HOUSE SPECIFICATIONS

The following considerations are essential for coming up with a proper housing design:

- The width of the house should not exceed 12 m in open-sided houses.
- Height should be at least 2.4 – 2.6 m on the higher side of a flat-roofed house
- The brick wall on the long side should be 40 - 50 cm and a 25-mm chick mesh wire to cover the gap between the wall and the roof.
- All brick surfaces should be plastered for ease of cleaning after every flock.
- Roof overlap should be 50 cm to prevent the wetting of birds and litter by rain showers coming from the sides.
- Routinely treat all gum poles and timber with creosote.
- Curtains need to be attached at the base

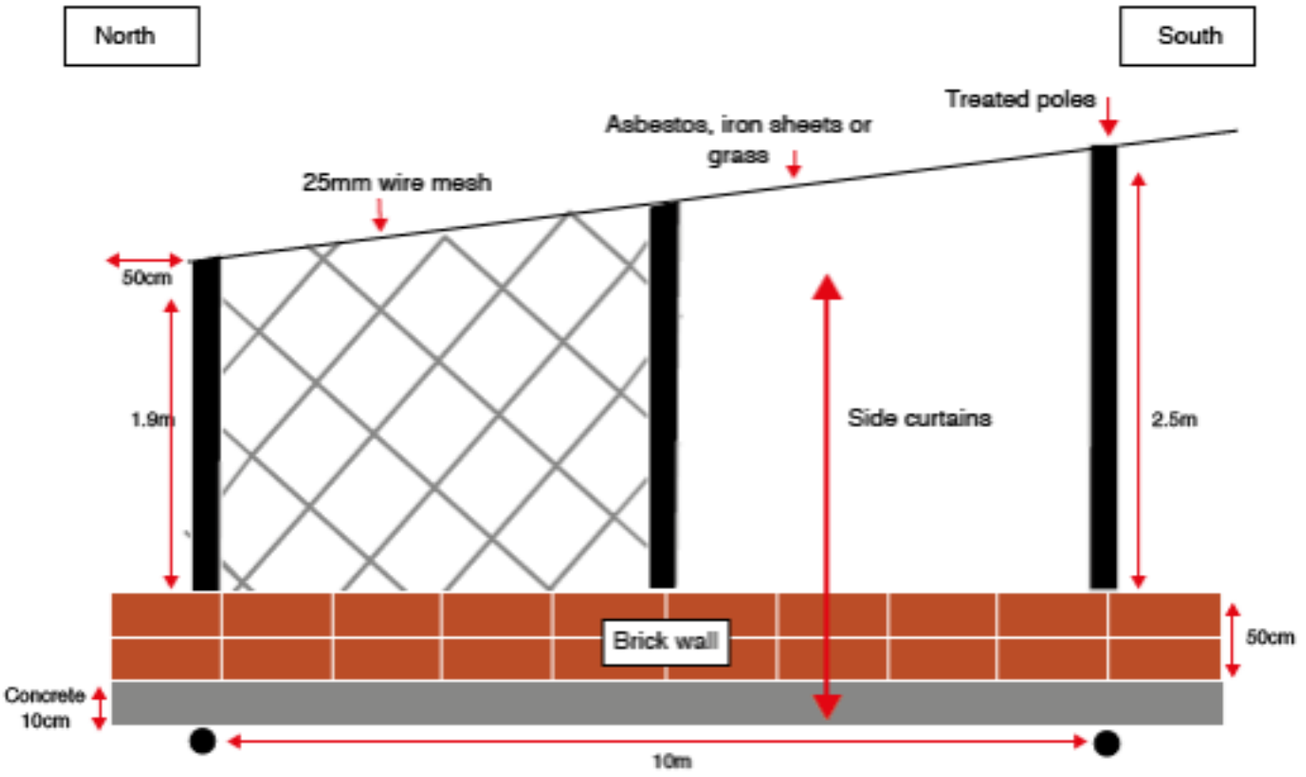


FIGURE 1: Flat Roof type housing

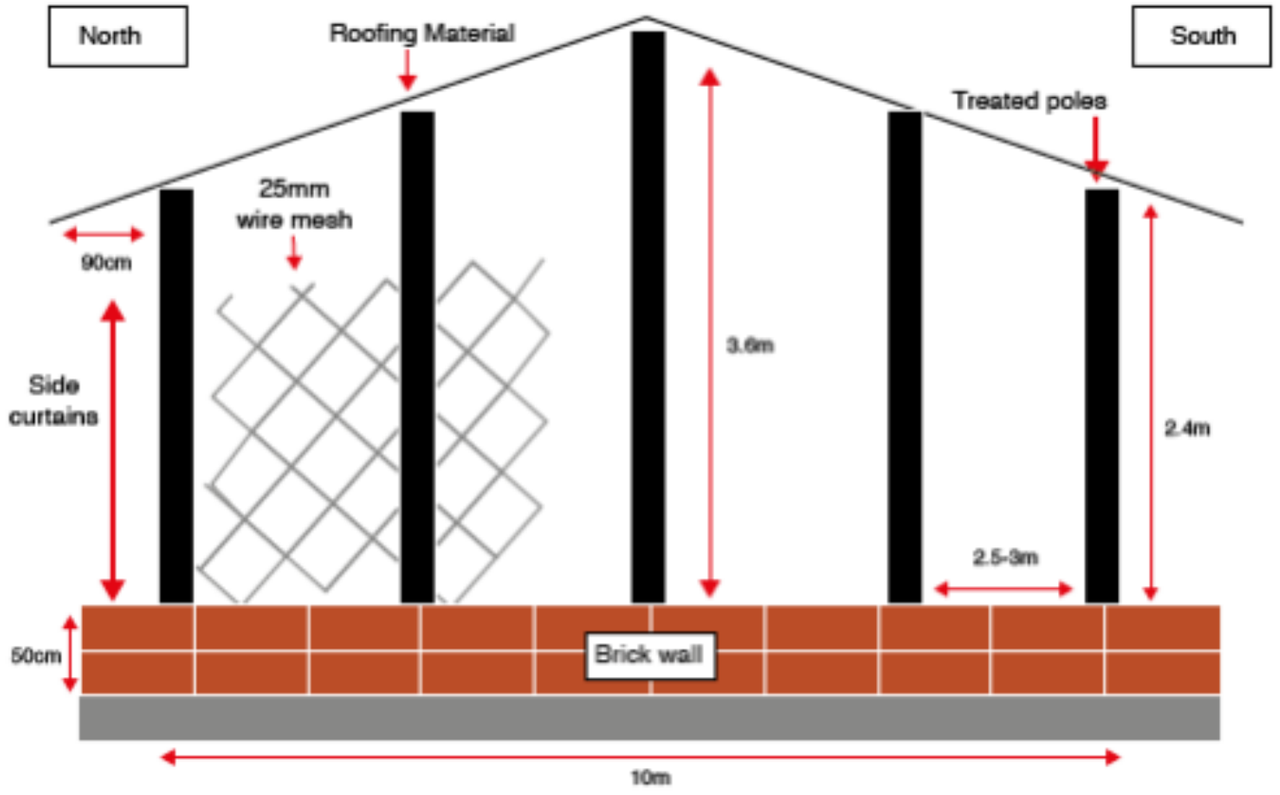


FIGURE 2: Conventional Roof type

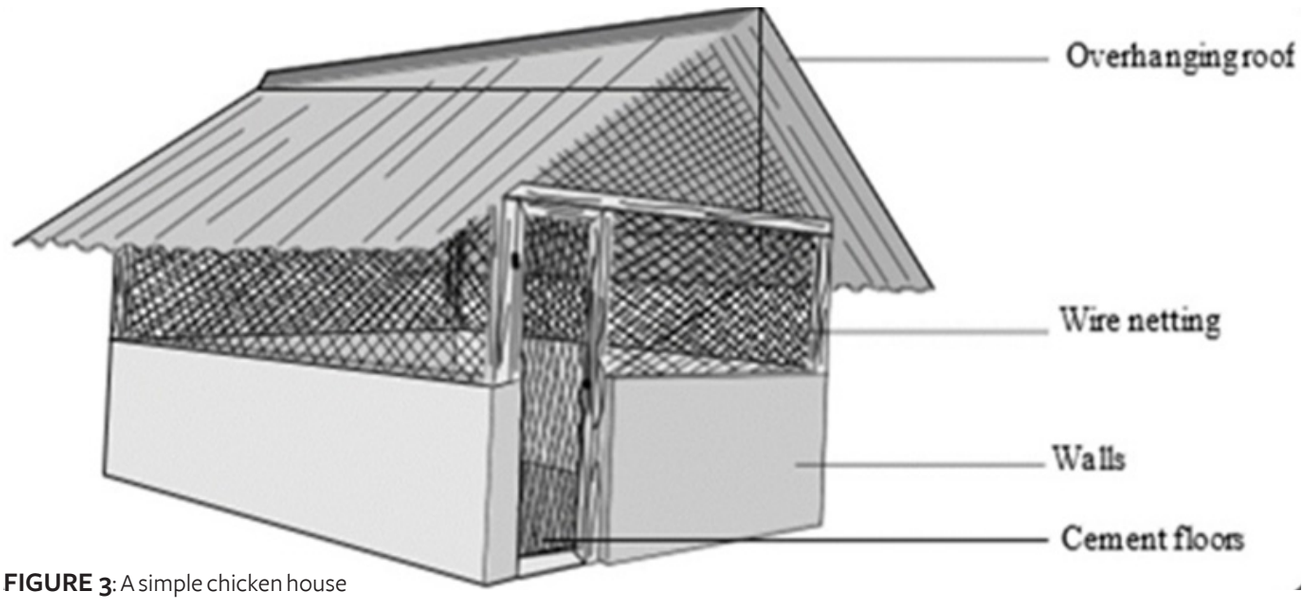


FIGURE 3: A simple chicken house

Teen, as well as adult birds, are often provided with elevated night housing. The housing may be built on poles to raise them well above the ground and protect birds from predators. Predators such as rats, snakes, dogs and other wild animals do not get access into such a house. They can also have inverted metal cones around the legs to prevent snakes and rats from climbing them.

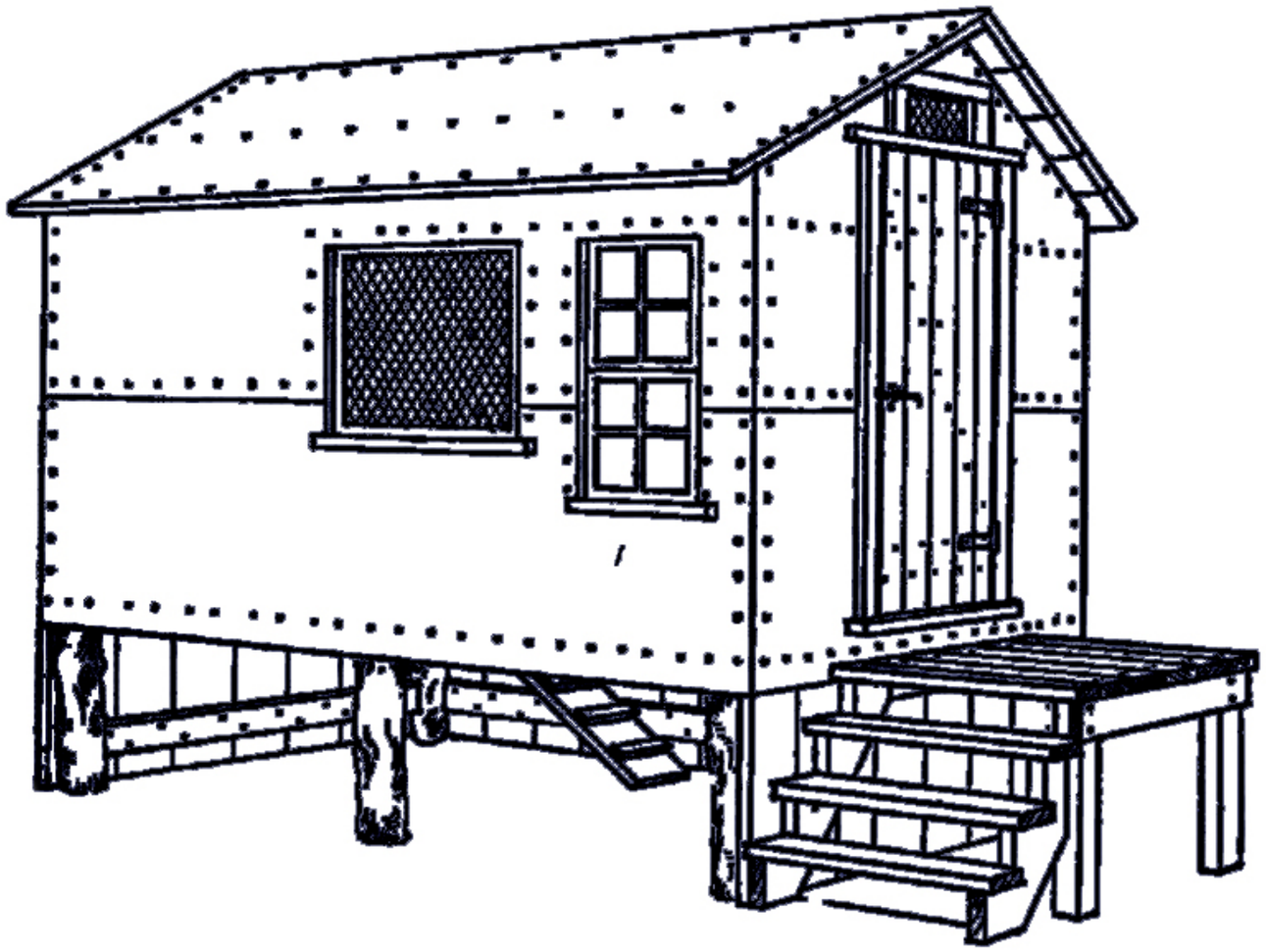


FIGURE 4: Elevated simple housing for 20-30 teen and adult birds

ACTIVITY 1

DISCUSSION

Ask farmers to answer the following questions.

- What are the basic requirements for a poultry house?
- Do you have a suitable place to build a chicken house? If so, describe the site.
- Do you have the suitable materials to build the house? What are they?
- Will you have to purchase some of these materials? What are they and their cost?

1.2.1 POULTRY HOUSE EQUIPMENT

When the poultry house has been properly constructed, the next thing is to furnish it adequately. This stage involves the addition of equipment and facilities that will complement the structure in creating comfort for the birds. The first stage in furnishing the house is to install the correct, comfortable litter or bedding.

ACTIVITY 2

DISCUSSION

Make a list of equipment that must be available in a poultry house and its uses

> LITTER/ BEDDING

Litter or bedding refers to the material laid out on the ground to insulate the birds from the floor conditions. The type of litter and the amount/depth of litter used are essential to consider as they affect the microenvironment created for the young birds.

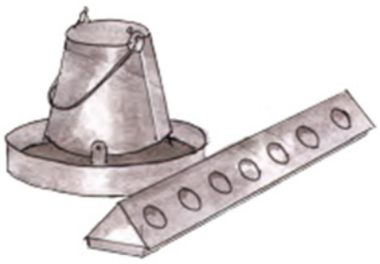
The function of litter is as follows:

- To absorb moisture.
- To dilute excreta, thus minimising bird to manure contact.
- To provide insulation from cold floor temperatures.

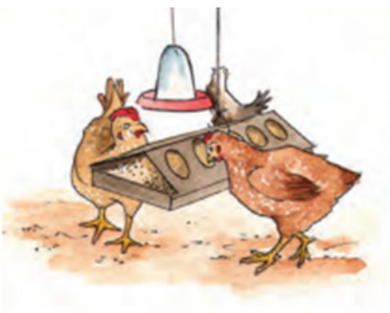
> LITTER TYPES

- Wood Shavings – the best, with excellent absorptive qualities.
- Sawdust - often high in moisture, prone to mould growth and chicks may consume it, which may cause aspergillosis.
- Grass – is often high in moisture, and the absorptive qualities are not very good.
- Cotton Husks – have low absorptive qualities.

FEEDERS AND DRINKERS

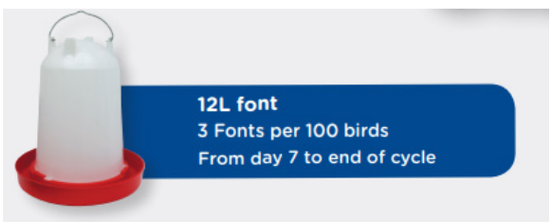


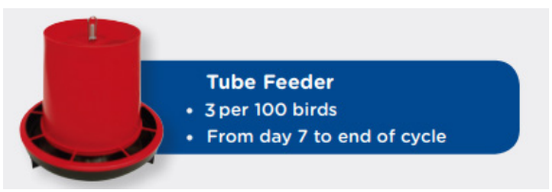
i) Simple drinker made of an old tin can and a plate.



iii) Commercial drinker/feeder in plastic or metal.

ii) Feeders and drinkers may also be made locally of wood, clay, plastic or metal.





Having installed the correct type and depth of bedding, the next important part of the house is the equipment. Poultry equipment is the materials the birds will use to access resources (feed, water and warmth) in their day-to-day lives. The following equipment is recommended for the poultry house. They are typically made of plastic and red and white:

- Feeding trays- Maybe round or square, used from placement today 7. The quantity must be 3trays/100 chicks.
- Tube feeders- for use from day 7 to the end of the cycle, start using tube feeders. The recommended rate is 100 birds per Feeder.
- Chick fonts, either 3 or 4 litres- Used from day 1 to day 7 at a rate of 3 fonts/100 chicks
- Drinkers (12 litres) - For use from day 7 to the age of 6weeks at a rate of 100 birds per drinker.

Ensure that feeders minimise feed wastage. Feed wastage can be minimised when feeders are not filled to the top. Fill the feeders half full and check them regularly for refills.

Some drinkers and feeders are locally made in many communities, usually by small scale metalworkers, using zinc metal. These are typically coloured in grey and or white. Whilst these may be cheaper, they have the disadvantage of being susceptible to rust, are heavy, and are not in the colours that attract chickens

1.2.2 HEATING SYSTEMS

It is crucial to ensure that birds have an appropriate temperature range in the poultry house.
If temperatures lie outside the ideal range, this may result in production problems.
Too high temperatures will discomfort the birds, and they will stop feeding, start getting dehydrated and eventually die. Too low temperatures will result in birds using their energy reserves to keep warm, slowing down their growth. When birds are still young, the farmer needs to provide extra heat during the brooding phase. Warmth can be provided through several methods and equipment.

Examples of heat supply equipment include;

- **INFRARED LIGHTS**
  This is an electric lamp that emits infra-red light hence supplying warmth to the birds. One such lamp will warm 100 birds on average. The advantage is that this is quite simple to install – it just needs an electricity connection. The disadvantage is that it needs a reliable source of electricity to ensure the birds are warmed consistently.

- **BRAZIERS/ MBAULAS**
  These are generally produced from metal sheets. The commonest is a drum cut into a shape that will allow wood, charcoal, or coal to be burnt inside, allowing the heat to be transferred to the environment. If it is the standard drum size and shape, one will warm about 500 birds. It is also relatively easy to put together. However, it needs constant monitoring because the wood or coal emit smoke, which will be very dangerous for the birds if allowed to accumulate in the poultry house. The trick is always to burn the fuel whilst the brazier is outside, and when the smoke has subsided and all gone, move it into the poultry house.

1.2.3 LIGHTING EQUIPMENT

Birds will require light to locate water and feed. Light equipment must be installed in a chicken house. If the house has electricity, then regular light bulbs will do. If there is no electricity, solar lights may be installed. The intensity of light in the poultry house must allow one to read a newspaper in all house pockets with no dark spots.

Standard Lighting Program

AGES-DAYS	HOURS DARK
0	0
1	1
100-160 grams	12
22	11
23	10
24	9
29	8
30	7
31	6

1.2.4 BIOSECURITY/ FOOT DIP

After preparing the house interior, the final task is to create the bio-security system. The system requires the installation of either a concrete dip or a bowl which will be filled with disinfecting chemicals. The most common effective disinfectant is Virukill. Dip the feed in the disinfectant before they access the poultry house. After this, you are now ready for your chick placement. However, the first thing is to prepare the house and prepare it to receive the birds. During this time, you should order chicks, feed, and chemicals.

FIGURE 5:Foot Dip place at the entrance of a pen

2. CLOSING SESSION

- Give farmers time to ask questions and respond to the questions. If there are some questions you cannot answer, write them down and refer to the Extension worker and give feedback in the next session.
- Go back to the objectives, ask farmers to explain what they have understood on each of the objectives, and close the session by asking questions. These questions go a long way in assessing the effectiveness of this session

MODULE 2: BROODING MANAGEMENT

DURATION	1 hour
METHODOLOGY	Plenary/Presentation/Discussion/ Demonstration
REQUIRED MATERIALS	• Flip chart and markers. • Fact sheets • Visual Aid

PREPARATION

1. The facilitator should read and understand the training content before delivering it to farmers.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.
3. Engage in active listening
4. Ask for information and opinions in a way that gets relevant, honest and appropriate responses
5. Use and interpret non-verbal communication; facial expressions, body movements and physical contact
6. Provide constructive feedback to others.

LEARNING OBJECTIVES

By the end of the session, farmers should be able to:

1. Prepare the poultry house for receiving new chicks
2. Check the quality of new chicks before placement
3. Receive and place new chicks in the brooder house
4. Check if the chick placement has been done correctly and take corrective measures where necessary.

A Brooder is a particular room designed to provide optimal conditions for the growth and development of the day-old chicks in the first three weeks of their lives.

FIGURE 6: A simple brooder

1. WHY BROOD?

Brooding is the most crucial period of a broiler chick's life, usually 1 -21 days.
Chicks cannot regulate body temperature for the first five days, and this is not fully developed until 14 days of age. The babe depends on the farmer to provide the correct litter temperature. Suppose the litter and air temperatures are too cold. In that case, internal body temperature will decrease, leading to increased huddling, reduced feed and water intake, stunted growth and susceptibility to disease.

2. PREPARATION FOR CHICK PLACEMENT

In preparation to receive a new batch of day-old chicks:

- ☐ The house needs to be dry-cleaned thoroughly to remove any bedding, manure and dirt. These should be disposed of as far away as possible from the poultry house, at least 300 metres.
- ☐ The house must then be wet-cleaned using detergents.
- ☐ All the equipment must be cleaned and washed– feeders, drinkers, and curtains.
- ☐ The walls of the poultry house must be painted with whitewash.
- ☐ The house must be allowed to rest for at least 10-14 days before the new placement.

3. CHICK PLACEMENT CHECKLIST

- ☐ Chicks should get water and feed as soon as they are placed.
- ☐ Gently remove them from the box and dip their beaks in water as you set them into the brooder
- ☐ Check for physical deformities and record any abnormality
- ☐ Record any mortality which would have taken place during transportation
- ☐ Do a physical count of the chicks delivered and record
- ☐ Weigh and record the average weight
- ☐ The brooding area should always be kept bright so that the chicks should not have any difficulty in locating feed and water round the clock

ACTIVITY 3

GROUP EXERCISE

Tabulate attributes of a good quality chick and bad chick

CHECK	ATTRIBUTES FOR A GOOD CHICK	ATTRIBUTES FOR A BAD CHICK
Reflex	Lay chick on its back. It should stand up within 3 seconds	Chick takes more than 3 seconds to stand up: chick is listless
Eyes	Clean, open and shiny	Closed, dull
Navel	Closed and clean	Bumpy, remnants of yolk, open navel; feathers smeared with albumen
Feet	Standard colour and not swollen	Red hocks, swollen hocks, malformation, deformed toes
Beak	Clean with closed nostrils	Red beak, dirty nostrils, malformations
Yolk sac	Stomach soft and malleable	Stomach hard and skin taut
Down	Dry and shiny	Wet and tacky
Uniformity	All chicks the same size	Chicks of uneven sizes (small, medium and big)
Temperature	Between 40 and 40.8 °C	Above 41.1 °C: too high below 38°C: too low. It should be 40 °C 2-3 hours after arrival

- The variety must fit in a growing season of 4 to 4 ½ months.
- The variety should give the highest yield for that particular area.
- They must be resistant to lodging especially where combine harvesters are used
- The variety should have a longer period between physiological maturity (a time when no more dry matter is added to the seed) and pod shattering.
- High pod clearance to reduce losses when harvesting with a combined harvester.
- Resistance to diseases, especially red leaf blotch, frog-eye and soybean rust

TABLE 2.1: Some of the characteristics of common soybean varieties

4. POST PLACEMENT CHECKLIST

Two very important "Chick Checks" should be made 24 hours post-placement. These two checks are simple & effective ways to evaluate pre-placement management.

4.1 CHICK CHECK 1:DONE 4-6 HOURS POST-PLACEMENT

- Sample 10 chicks per brooding area.
- Check the temperature of feet against the cheek.

An excellent indicator of floor temperature is the temperature of the chick's feet. If the chick's feet are cold, the internal body temperature of the chick is also reduced. Hard chicks will be seen huddling with reduced activity, resulting in reduced feed and water intake and, therefore, a reduced growth rate. By placing the feet against your neck or cheek, one can readily learn how warm or cold the chick is. Comfortably warm chicks should actively move around the brooding area.

TOO HOT -The chicks move away from the source of warmth and are usually seen crowding along the wall.
TOO COLD - The chicks crowd together in a corner or under a brooder with a distress noise.
DRAFTY – All chicks are moved to one side of the house due to either a draft, noise or light.
CORRECT TEMPERATURE - The chicks are evenly spread with a content noise

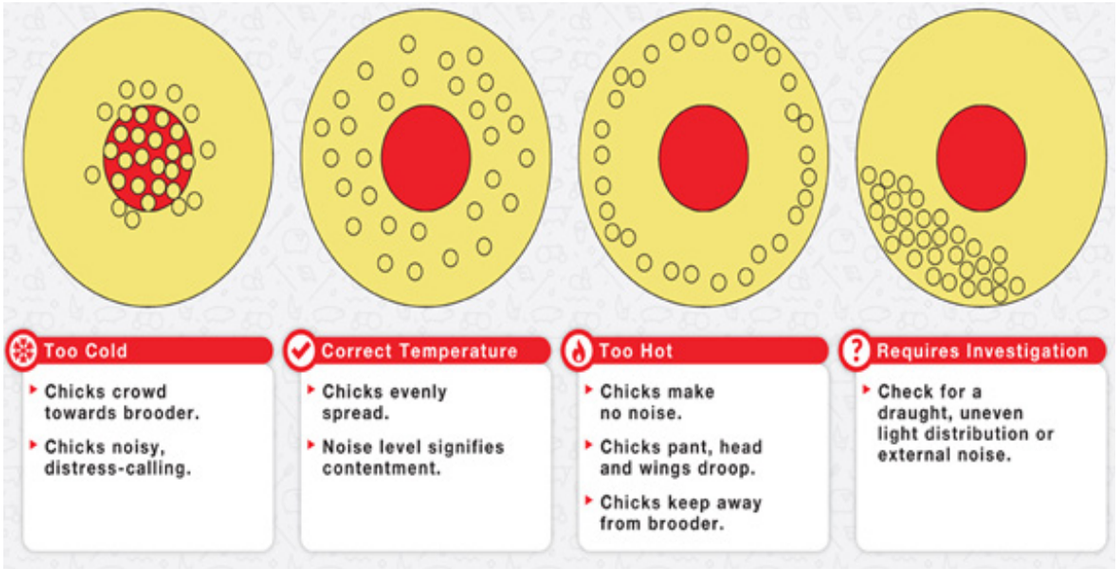


FIGURE 7:Foot Dip place at the entrance of a pen

4.2 CHICK CHECK 2: 24 HOURS POST-PLACEMENT

The chicks' crops should be checked the morning after placement to ensure they have found feed and water.
At this time, a minimum of 95% of the crops should feel soft and pliable, indicating that chicks have successfully located feed and water. A full, hard crop indicates chicks have not found adequate water. Water availability should be checked immediately.

ACTIVITY 4

DEMONSTRATION

Take the farmers to a poultry house and perform a Seven-day Bodyweight Check

Weekly body weight is an excellent overall indicator of how successful the brooding management has been.

At seven days of age, randomly select a 10% sample of the birds from the house, weigh them, and calculate the average weight. Compare this average weight against the breed average for the particular breed you raise. Suppose your weights are way off lower than the breed average. In that case, you need to look at the total conditions prevailing in the house, including feed, to ensure everything is as it should be. Make adjustments on anything found not to be in order.

5. CLOSING SESSION

- Give farmers time to ask questions and respond to the questions. If there are some questions you cannot answer, write them down and refer to the Extension worker and give feedback in the next session.
- Go back to the objectives, ask farmers to explain what they have understood on each of the objectives, and close the session by asking questions. These questions go a long way in assessing the effectiveness of this session

MODULE 3: FEEDING/ NUTRITION

DURATION	1 h30min
METHODOLOGY	Plenary/Presentation/Discussion/ Demonstration
REQUIRED MATERIALS	• Flip chart and markers. • Fact sheets • Feed mixing ingredients & apparatus

PREPARATION

1. The facilitator should read and understand the training content before delivering it to farmers.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.
3. Engage in active listening
4. Ask for information and opinions in a way that gets relevant, honest and appropriate responses
5. Use and interpret non-verbal communication; facial expressions, body movements and physical contact
6. Provide constructive feedback to others.

LEARNING OBJECTIVES

By the end of the session, farmers should be able to:

1. Identify the different types of feed required at the various ages of the birds
2. Plan and budget for the correct amount the total feed needed per batch of chickens
3. Ensure that chickens have the right type and amount of feed 24/7

1. FEEDS

Poultry feeds are food for poultry that has been blended from several raw-material feedstuffs using a special formula to meet the physiological needs of the birds. Feed is critical in poultry production, constituting 60 – 70% of production costs. Compounded (mixed) feed is expensive, and for this reason, many farmers have resorted to homemade feeds.

1.1 WHAT TO FEED?

The composition and availability of feeds will vary, depending on the season, locality and production system. Poultry, like other animals, needs feed containing energy and protein and vitamins, minerals, and water. The need for feed will change, depending on the age and status {chicks, growers (pullets), egg layer, broody hen} of the bird.

The cheapest – and often the best – way to supplement the diet of your poultry is to use local resources.

However, many vitamins and nutrients are destroyed if stored too long or under unfavourable conditions, e.g. high humidity and heat. Knowledge of feed quality and sources of different feed types is essential for feed safety. A variety of commercial diets may be offered if your production is based on improved breeds or hybrids for egg production.
These are divided into three distinct categories, with decreasing amount of protein as follows;

1. Chick mash (or starter diet): high in protein; offered from day old up to 8 weeks;
2. A growers' diet/mash: medium in protein; offered from 9 weeks up to when they start dropping eggs;
3. A layers' diet/mash: medium in protein; offered to hens when they start laying.

1.2 TYPES OF FEEDS

> **ENERGY FEEDS**

Generally, 75% of a quality poultry diet comprises energy feeds. These are the most critical feeds for maintenance requirements (e.g. body temperature, vital functions, exercise).

Examples of energy feeds are cereals like maise and its by-products (bran), sorghum, wheat and its by-products (bran), rice and its by-products (bran, polishing), cassava root meal, yams and sweet potatoes. Roots and tubers should be soaked in water for 60 minutes or cooked before drying to remove harmful substances. The proportion in the diet, in general, should be kept below 10%. Fat is also a good source of energy mainly, in hot climates, as the heat produced during metabolism is

less than that from traditional energy feeds, e.g. cereals. Sources of fat are animal fats and oilseed cake meals. Such oils and fats should only be given in small amounts, i.e. less than 10% of the total diet.

> PROTEIN

Protein is needed for growth and optimal health status. Usually, up to 20% of a poultry diet comprises protein-rich feeds, mainly cost. Protein sources may originate from animals or plants. Examples of protein-rich local feeds include; termites, insects, worms, meat scraps, fish scraps, fresh-water shrimps, fish meal, meat meal, bone meal, blood meal, soya bean meal, peas, beans, oil cakes from; groundnuts, cotton seeds, palm kernels, and coconuts.

> MINERALS

Minerals are essential for bone formation, eggshell formation, and optimal health status. The most important minerals are calcium and phosphorus. Laying hens need free access to calcium (limestone or crushed shells) to produce strong eggshells. Mature birds are usually able to balance their mineral intake according to their requirements. It is necessary to balance phosphorus-rich feeds with calcium-rich feeds because a high level of one mineral will cause a deficiency of the other. Sources of minerals include bone meal, limestone and burned eggshells.

> VITAMINS

Scavenging birds get vitamins from eating green grass, vegetables, fresh cow dung and through sunlight. The deficiency of vitamins A, B2, and D3 can lead to various problems in birds. Sunlight and green grass or green fodder normally provide Vitamin A and D, whereas Vitamin B may come from fresh cow dung. Vitamin B may also be added by giving multivitamins.

Additional vitamins are given in small quantities and purchased from agro-vet stores or feed stockists. Supplementary vitamins are usually not required when birds are left to scavenge. Confined or intensively managed birds always need additional vitamins added to their feeds.

> WATER

Water is an essential nutrient that impacts all physiological functions. Water comprises 65-78% of the body composition, depending on age. Factors including temperature, relative humidity, diet composition and changes in body weight affect water intake. Good water quality is vital to efficient broiler production.

Water consumption must increase over time. If water consumption decreases at any point, bird health and general management need to be assessed.

1.3 MIXING FEED

Formulation of compounded poultry feed is both an art and science. Hands field demonstrations are essential. Ensure that the raw materials are high quality, wholesome and safe for consumption. Pay attention to adequate mixing of minerals/vitamins in the animal feeds using a formula from a feed nutritionist. Correctly weigh and measure feed ingredients premix with a portion of the significant ingredients in a suitable mixing facility.

FIGURE 8: mixing feeds for a small-scale farmer

ACTIVITY 5

Use the following steps to assist the farmer in mixing good quality feed

1. Get a formula for the target animal species and age from a qualified animal nutritionist.
2. The formula should be based on the feed ingredients that are locally available within the farmer's environment.
3. Collect and weigh all the target ingredients to be used. Ensure they are available in the required quantities for the feed ratio you are preparing to mix.
4. Get a clean cement screened floor
5. Get a shovel or a fabricated mixer, a simple motorised hummer mill, ten new bags, a roll of string, and a marker.
6. Premix the raw materials with a shovel to get a homogenous mixer.
7. Using a simple hummer mill, mill the ingredients to the correct particle size for the different age groups of birds (Chicks, growers, layers, broilers etc.).
8. Weigh the smallest quantities first and mix them to make a homogeneous mixture.
9. Mix the ingredients of relative weights to get a homogeneous mixture.
10. Make the final mixture by mixing the mixture with the bulkiest ingredient.
11. Spread one ingredient thinly on the ground, spread the other on top, then mix them using your hands or spade to make a heap. Transfer the mixture from one heap to another while pouring the ingredients on top of the heap.
12. Mix the raw materials and the premix – mineral mixture thoroughly between 15 to 20 times to achieve a uniform mixture.
13. Bag the feed in the new 50kg bags and tie the bags with a string.
14. Label the feeds with a maker to show the type of feed and the date of mixing.
15. Store the feed on wooden pallets, not more than five bags, one on top of the other in a well-ventilated feed store.

1.4 HOW MUCH TO FEED?

The birds scavenge for feed from their surroundings, a significant economic advantage of free-range or semi-intensive poultry production systems over intensive systems. Scavenging resources will change over the seasons based on climate, geography and production systems in the area. Depending on the season, the chicken may find nearly all their needs from their surroundings (e.g. during harvest) or nothing (during dry season).

TABLE 1: Amount of feed at different ages of poult

AGE	INTAKE/ BIRD/ DAY/ (g DRY WEIGHT)
1	12-15
2	15-21
3	21-35
4-6	35-50
7-8	55-60
16-27	68-80
28	100

Limit the feed offered to the birds daily to at least 30% - 50% of their entire daily intake. Allow a maximum of 30-40 g/bird/day from week 4-6 and gradually reduce the supplementary feeding. From day old to 4 weeks, young chicks will receive feed according to their needs. As the birds grow, they will gradually get a smaller portion of what they need until they only get between 1/3 and half of their needs as adults.

ACTIVITY 6

Calculate the daily feed requirements based on a flock of 1 cock, 4 hens and 15 three week old chicks

FLOCK	INTAKE/BIRD/DAY	TOTAL/DAY
1 cock	35g	35g
4 hens	4 x 35g	140g
15 chickens	15 x 25g	375g

Ensure that feeders minimise feed wastage. Feed wastage can be minimised when feeders are not filled to the top. Fill the feeders half full and check them regularly for refills.

2. CLOSING SESSION

- Give farmers time to ask questions and respond to the questions. If there are some questions you cannot answer, write them down and refer to the Extension worker and give feedback in the next session.
- Go back to the objectives, ask farmers to explain what they have understood on each of the objectives, and close the session by asking questions. These questions go a long way in assessing the effectiveness of this session

MODULE 4: HEALTH MANAGEMENT AND BIOSECURITY

DURATION	2 hours
METHODOLOGY	Plenary/Presentation/Discussion/ Demonstration
REQUIRED MATERIALS	• Flip chart and markers. • Fact sheets • Visual aids • Chickens

PREPARATION

1. The facilitator should read and understand the training content before delivering it to farmers.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.
3. Engage in active listening
4. Ask for information and opinions in a way that gets relevant, honest and appropriate responses
5. Use and interpret non-verbal communication; facial expressions, body movements and physical contact
6. Provide constructive feedback to others.

LEARNING OBJECTIVES

By the end of the session, farmers should be able to:

1. List at least 3 critical diseases of economic importance in their area
2. Explain how these diseases can be prevented.
3. Carry out a drinking water vaccination procedure

Health is wealth. The health of birds must be well managed for better profit. Prevent disease occurrence because prevention is better than cure. The first step towards good health management and disease prevention is to clean, wash and disinfect the pen and its equipment. It also involves selecting good chicks, giving appropriate medications and vaccines as recommended by the Veterinary Doctor, biosecurity and managing litter appropriately.

1. DISEASES

1.1 WHAT IS DISEASE?

The disease can be defined as any change or impairment of normal body function that affects the chickens' ability to survive, grow or reproduce. Understanding the cause of a disease and its method of spread (transmission) will assist in controlling it. Knowledge of the clinical signs of disease and the characteristics of lesions found at Postmortem will help diagnose and institute preventative measures.

1.2 WHY LEARN DISEASE MANAGEMENT AND CONTROL?

1. Diseases kill
2. Interfere with normal growth
3. Reduce productivity (eggs/ meat)
4. Diseases lead to heavy losses
5. It affects local and international trade

1.3 CAUSES OF DISEASE

Many diseases – called infectious diseases – are caused by organisms transmitted from one bird to another. Such organisms include viruses, bacteria, fungi and protozoans. Other infectious organisms are external parasites (such as lice, fleas and ticks) or internal parasites (such as roundworms, tapeworms and flukes). In many cases, disease results from a combination of factors. The factors may include husbandry, nutrition, environmental factors and flock management. All these have a direct and essential influence on the health and productivity of chickens.

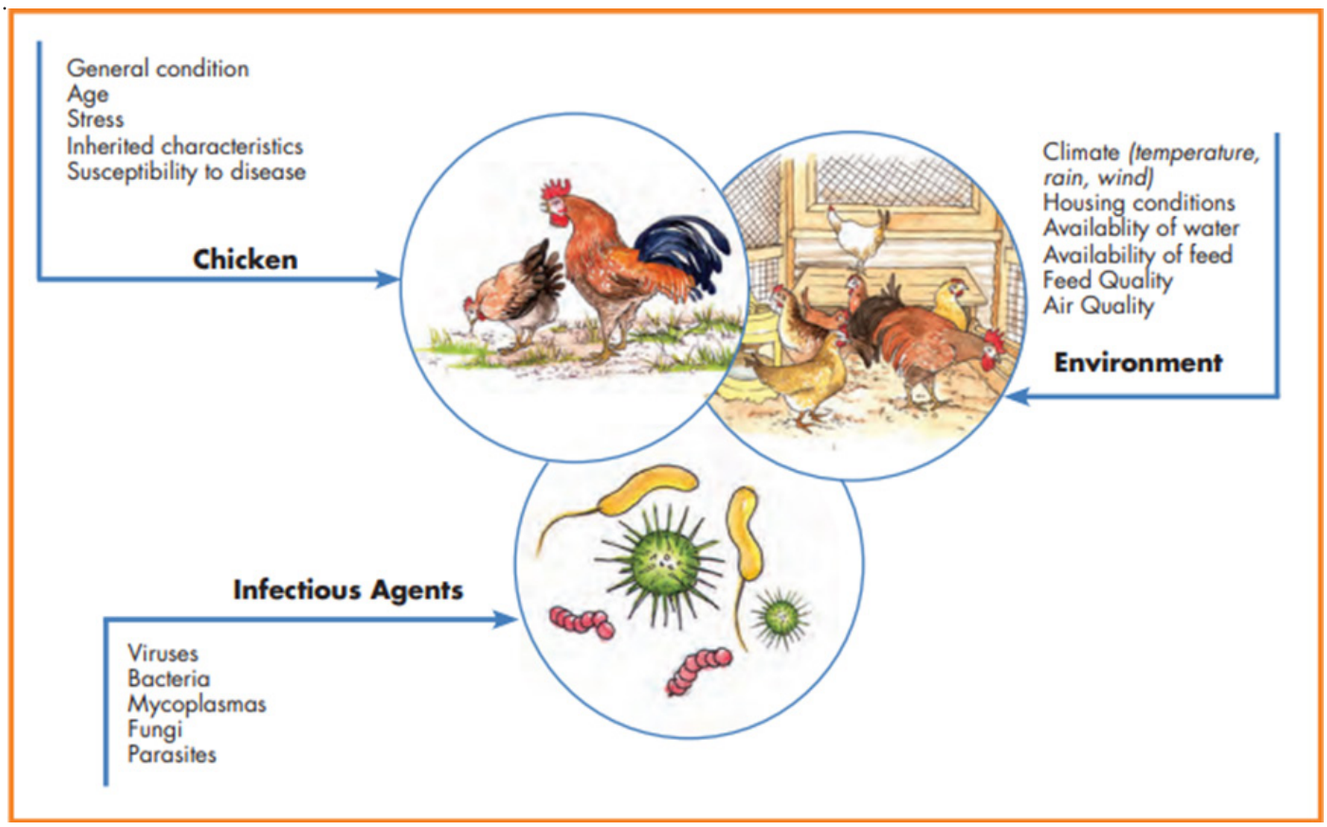


FIGURE 8: Factors influencing the health status of a chicken

ACTIVITY 7

List characteristics of healthy and unhealthy chickens

CHARACTERISTICS OF HEALTHY BIRDS

- Alert and on guard
- Bright eyes and comb
- Walk, run, stand and scratch
- Continuously eat and drink
- Normally lay eggs
- Normally smooth and neat feathers
- Soft compact droppings
- Breathe quietly

CHARACTERISTICS OF UNHEALTHY BIRDS

- Tired and lifeless
- Dull eyes and comb
- Sit or lie down
- Eat and drink less
- Diarrhoea
- Lay less or stop laying eggs
- Ruffled and loose feathers
- Wet droppings with blood or worms
- Cough, sneeze and breathe noisily.

COSTS ASSOCIATED WITH DISEASE

- Mortality
- Morbidity
- Reduced productivity- weight gain/egg production
- Downgrading at processing
- Treatment
- Vaccination
- Surveillance and monitoring
- Loss of market
- Public health control
- Welfare perceptions

2. CLASSIFICATION OF POULTRY DISEASES

Classification of diseases in poultry is done according to:

1. The causes (Viral, Bacterial, Fungal, Parasitic, Nutritional).
2. The organs affected (Renal, Genital, Respiratory, Nervous, Digestive, and General).

2.1 COMMON POULTRY DISEASES

The table below illustrates the common poultry diseases, causes, symptoms, treatment and prevention.

DISEASE	CAUSE	SYMPTOMS	PREVENTION & TREATMENT
Infectious Coryza	Bacterial	Foul smell and discharge from the eyes and nostrils, swollen, facial tissue and wattles, sneezing, coughing, difficulty breathing, no appetite, drop in egg production, high mortality	1. Vaccinate healthy birds. 2. Stock coryza free birds 3. Seek to advise from your local vet for treatment
Avian Influenza (AI)	Virus	High mortality, swelling of the head, purple discolouration of the head, comb and wattles, subcutaneous haemorrhages, shortness of breath, diarrhoea,	1. Vaccinate the healthy birds 2. Stock AI free birds 3.No treatment 3. Notify the authorities
E. Coli	Bacterial	Loss of birds, production usually maintained, huddling together and ruffled feathers for chicks, breathing is laboured, they snort and cough, lame birds	1. Good hygiene and good house climate. 2. Organic acids in feeds 3. Seek advice from your local vet for treatment

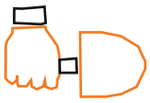
Lice	External parasites	Seen on feathers, around vent, breast, underwings and on the back, drop in egg production, droopy birds, ruffled feathers, low immunity	1. Mix the poultry powder with a dust bath.
Worms	Internal parasites	Weight loss, diarrhoea, poor growth in chicks, drooping wings, death, pneumonia, gasping for air and suffocation	1. De-worm every two months 2. Seek advice from your local vet.
Coccidiosis	Internal parasites	Mortality, bloody diarrhoea, loss of performance, reduction in weight and poor feed conversion ratio	1. Use coccidiostats in feeds 2. Vaccinate the young birds in the first 3 days 3. improve on litter management 4. Seek advice from your local vet.
Newcastle disease (NCD)	Viral	High mortality, twisting of neck, paralysis, walking backwards, coughing, hemorrhagic and necrotic gastro-intestinal lesions, drop in egg production—bleeding in the proventriculus.	1. Vaccinate the healthy birds 2. Notify the authorities 3. No treatment 4. Seek advice from your local vet.
Mite Grey mite and Feather mite	Parasite	Mites attack feathers, suck blood, weight loss, pale comb and wattle	1. Spray the poultry houses with an acaricide 2. Spray the affected birds with an appropriate acaricide.
Infectious Bronchitis (IB)	Viral	Cough, sneezing, laboured breathing, mortality 5-20%. For layers affects the genital tract-sterility, respiratory distress, drop in egg production, deformed eggs	1. Improve disinfection and biosecurity. 2. Vaccinate healthy birds. 3. No treatment.
Gumboro disease - Infectious Bursal Disease (IBD)	Viral	Prostration, trembling, greenish diarrhoea, growth retardation, high mortality in 3 days, lesions –Haemorrhage of the pectoral muscles, the thigh, at the junction between the proventriculus and the gizzard. Oedema, haemorrhage, necrosis of the cloacal bursa	1. Disinfect (formaldehyde gas). 2. Vaccinate healthy birds. 3. Improve biosecurity. 4. No treatment 5. Seek advice from your local vet.
Fowlpox	Viral	Papule-vesicular-pustular eruptive nodular lesions on the head, feet, the cloaca or the mucous membranes of the digestive and respiratory passages, weakness	1. Disinfect 2. Vaccinate healthy birds. 3. Control secondary bacterial infection. 4. Treat open wounds. 5. Seek advice from your local vet

3. EFFECTS OF CLIMATE CHANGE

Climate change causes temperatures and rainfall patterns and brings in climate extremes. The extremes affect animals, plants and the distribution and pressure of pathogens and diseases affecting these hosts. Cold weather is more conducive to certain infectious diseases, such as Newcastle Disease (NCD), Avian Influenza (AI), Infectious Bronchitis (IB) and Infectious Bursal Disease (IBD/Gumboro).

Cooler temperatures allow these viruses to survive longer and increase the disease risk, making it harder to manage them. They also cause birds to huddle together more, and this closer proximity of birds increases the risk of disease transmission. Warmer temperatures help to destroy some of these viruses. However, on the other hand, higher humidity levels worsen respiratory problems and enteric diseases. Temperatures that are too high or low and unfavourable relative humidity causes stress that can render birds more vulnerable to diseases and strain their productive performance.

ACTIVITY 8



PRACTICE

Have the farmers examine a few birds thoroughly for the following signs to assist them in identifying sick birds easily:

GENERAL SIGNS

- Is the bird active or sleepy?
- Are the feathers smooth, clean and free of external parasites?
- Is the bird well nourished? (Feel the breast muscle of the bird: birds that have been sick for a long time lose bodyweight and have thin breast muscle. Feel the muscle of other birds for comparison.)
- Has the bird eaten within the last few hours? Feel the crop to confirm.

RESPIRATORY SIGNS

- Is the bird breathing through an open beak?
- Is the breathing noisy?
- Is the birds coughing or sneezing?
- Are there swellings around the eyes and discharge from the eyes, nose or beak? If present, nasal discharge can be squeezed out by pressing gently above the nostrils.

DIARRHOEA

- Are the feathers around the vent dirty? The feathers will be dirty when the bird has diarrhoea.

NERVOUS SIGNS

- Does the bird show any nervous signs (e.g. twisted neck, trembling)?

MOVEMENT

- Is the bird lame?
- Are the joints swollen?
- Are the legs and wings in a normal position

SKIN AND FEATHERS

- Are there external parasites on the feathers and other body parts (head, under the wings, above the vent)?
- Are there injuries or lesions on the bird's skin, especially on the head, comb and wattles?
- Are the feathers damaged?
- Are there colour changes (pale, dark, bluish) or the size of the comb or wattles?

4. BIOSECURITY

Biosecurity is a set of management practices that collectively reduce the likelihood of introducing or spreading disease-causing organisms onto and between sites.

Most infectious agents enter the chicken via the beak while eating, drinking or cleaning its feathers, or breathing. Other infectious agents can infect a wounded chicken. The agent then multiplies within the chicken and may spread, causing damage to specific organs resulting in clinical signs. After multiplication, some infectious agents leave the chicken through droppings, in discharges from lesions, in its breath, or even on dropped feathers. When other chickens contact these contaminated items, they may also get infected.

Once an infectious agent enters the chicken, the chicken does not get sick immediately. It usually takes some days for the bird to show signs of illness. This period is referred to as the 'incubation period'. During this period, the bird does not show any signs of disease. However, the number of infectious organisms inside it increases rapidly. Some organisms may leave the bird when it breathes, drinks or pass droppings, meaning the agents causing an infectious disease can be spreading even before clinical signs of the disease are manifested

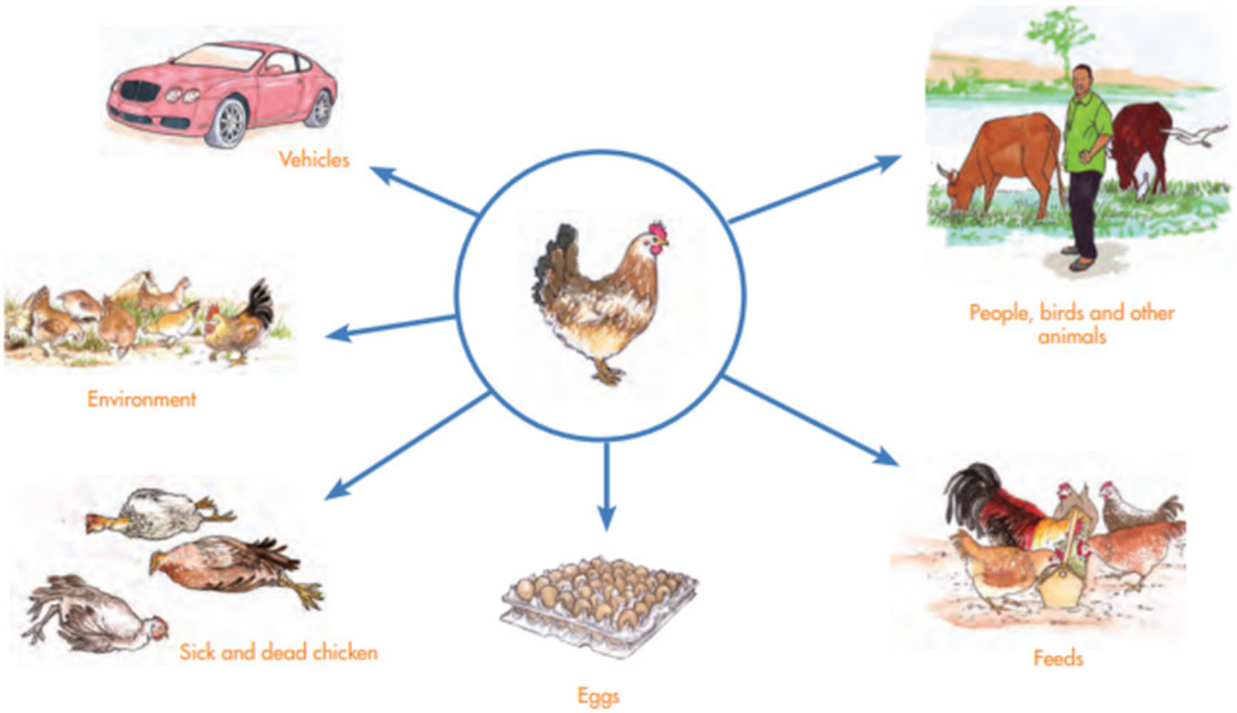


FIGURE 9: How diseases are spread

4.1.COMMON BIOSECURITY MEASURES

ACCESS TO FARMS

- All doors and gates must always be closed and locked.
- Visitors must pass through this facility and change into transit clothing where transit facilities are provided.
- Everyone entering the farm must shower and change into farm uniforms and gumboots.

VEHICLES

- No vehicles should be allowed inside the farm other than those essential for farm duties and must be disinfected prior to entering the farm.
- Feed delivery drivers may not leave the truck cabin without showering and changing into warm clothes.
- Keep tyre dips clean and disinfected using the correct dose or a disinfection spray. It is recommended that spray races be used with the tyre dips.
- Farm staff must unload feed while the driver remains inside the truck

EQUIPMENT

- Avoid bringing equipment from other farms.
- Clean and disinfect, fumigate all equipment brought onto the farms where possible.

FEEDS & WATER

- Keep silo covers and feed store doors closed.
- Keep water tank covers closed.
- Clean the water tanks, cooling tanks & flush nipple lines every other day.
- Ensure water sanitation in all farms.
- Repair and prevent any leakage from the tanks

RATS & WILD BIRDS

- Avoid holes in the walls & under the doors.
- Avoid feed spillage around feed stores or in and around poultry houses.
- Water tanks must always be kept covered with the correct lid.
- Silo covers and feed store doors must always be closed.
- Keep service room doors closed.

- Maintain rat poison in panelboards, cooling rooms and service rooms.
- Wood shavings must be kept indoors.
- Keep grass cut short for 20 metres around poultry houses.

IMPORTANT

- Anything used outside the farm should not be used inside without proper disinfection.
- Anything used inside the farm should preferably not be taken outside the farm.
- Clean all foot dips and refresh them at least every 48 hours.
- Keep tyre dips clean where applicable and replace water & disinfectant as required.
- Clean service rooms, farm accommodation & bathrooms daily.
- Dispose of dead birds daily, preferably by incineration or use a pit.
- Old litter must be disposed of immediately and adequately.

Although vaccination remains an integral part of disease control, **VACCINATION CANNOT PROVIDE COMPLETE PROTECTION WITHOUT STRICT BIOSECURITY. HOWEVER, WITH STRICT BIOSECURITY, A FARMER CAN PREVENT UP TO 90% OF THE DISEASES ON THE FARM!**

5. VACCINES AND VACCINATIONS

Vaccines protect the chicken from infectious diseases, but they cannot treat diseases. Moreover, vaccines are disease-specific and protect the chicken against a specific disease rather than all diseases. Vaccines work best on healthy, well-managed chicken.

5.1. WHY VACCINATE?

1. Because many infectious disease agents are always present in the environment and are difficult to control even with the best biosecurity measures
2. To reduce losses due to morbidity and mortality caused by infectious agents
3. To protect the chicken against diseases causing egg production drop and eggshell deformities

5.2. VACCINE SPECIFICITY

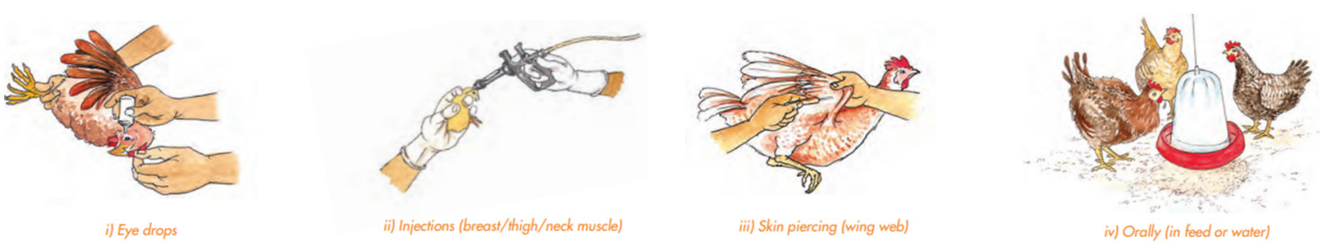
A particular vaccine will protect the chicken against a specific disease. Chicken may suffer from other diseases despite successful vaccination. VACCINATION can NEVER provide 100% protection, but it is part of a complex preventative policy of which biosecurity and hygiene are equally essential.

5.3. RULES OF VACCINATION

1. Vaccination should not be administered to sick birds
2. Always adhere to the genetic makeup of the chicken
3. Cost the benefits of vaccination against potential loss
4. Maternal antibody status - often has a significant effect on the design of a vaccination programme.

5.4. ADMINISTRATION OF VACCINES

Strictly follow the manufacturer's instructions and use vaccination schedules recommended by the breeders, in collaboration with the local veterinary



i) Eye drops *ii) Injections (breast/thigh/neck muscle)* *iii) Skin piercing (wing web)* *iv) Orally (in feed or water)*

FIGURE 10: Some vaccination methods

Vaccination tools include vaccines, Distilled water, Sterile needles, syringes, a Coolbox and a clean apron and gumboots.

Disposal and protection

- When the vaccine remains unused, add hot water to it and discard the mixture in the toilet or add any disinfectant before disposing of it. Properly dispose of the used vaccine containers in a pit latrine or incinerator.
- Whenever you are using vaccines, protect yourself using gloves to reconstitute in water and use nose and eye masks for spray vaccines.
- NEVER discard the unused vaccine in the poultry house after vaccination because you contaminate the house with microorganisms.
- Wash your hands with soap and water and take a shower after the exercise.

Vaccine failure is when a disease caused by a specific wild virus appears during the protection period (2 weeks and above after vaccination, when effective immunity is working). Possible causes are:

1. Poor storage
2. Stress
3. Presence of maternal antibodies
4. Excessive rapidity of the vaccinator
5. Health status of the birds
6. Immune suppression induced by mycotoxins-aflatoxins.

6. CLOSING SESSION

- Give farmers time to ask questions and respond to the questions. If there are some questions you cannot answer, write them down and refer to the Extension worker and give feedback in the next session.
- Go back to the objectives, ask farmers to explain what they have understood on each of the objectives, and close the session by asking questions. These questions go a long way in assessing the effectiveness of this session

MODULE 5: MARKETING

DURATION	45 min
METHODOLOGY	Plenary/Presentation/Discussion
REQUIRED MATERIALS	• Flip chart and markers. • Fact sheets • Visual aids

PREPARATION

1. The facilitator should read and understand the training content before delivering it to farmers.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.
3. Engage in active listening
4. Ask for information and opinions in a way that gets relevant, honest and appropriate responses
5. Use and interpret non-verbal communication; facial expressions, body movements and physical contact
6. Provide constructive feedback to others.

1. MARKETING

Marketing is critical to improving the poultry enterprise's visibility and revenues.

1.1. WHAT IS MARKETING?

Marketing is the science and art of exploring, creating, and delivering value to satisfy the needs of a target market at a profit. In poultry, it involves producing a high-quality product (e.g. eggs, chicken, chicken meat), processing it (e.g. simple slaughter, cleaning, freezing, storing) and selling it to targeted customers (supermarkets, processing plants, restaurants) at a profit

1.2 HOW DO I IMPROVE THE MARKET OF MY PRODUCTS?

All poultry farmers want to see financial gains from their efforts. However, most of them spend a lot of resources and energy on production and overlook the core aspect of marketing. Do the following to improve your market:

> PRODUCT

Produce a high-quality product in quantities required by the market and brand them if possible. e.g. clean, sorted, graded and packed eggs for sale. Consider adding value to your products (e.g. yellow yolk eggs, frozen meat, meat parts) for a niche market and improved income.

> PRICE

Most customers are price sensitive. Set an attractive and competitive price for your product compared to the market and your competitors. For example, if the current market price is **X** per tray of eggs, do not sell yours at **Y.**

> LOCATION

Locate your business (farm or outlet) in a convenient place- easily accessible to customers, suppliers and transporters.

> PROMOTION

Make your products known by talking to individuals, companies, announcing at village gatherings, participating in exhibitions, advertising on placards, radio, television, newspapers and social media.

> CUSTOMER

Know your customers, treat them with respect and dignity, take time to talk to them and swiftly respond to their queries. Consider giving credit and discounts to loyal and consistent customers.

> COMPETITORS

Know your competitors, their share of the market, what they do and how they do it so that you can adjust accordingly.

2. VALUE ADDITION

By adding value to their products, poultry farmers have an opportunity to mitigate their losses and improve their markets and income. Value addition involves processing products to increase their life span and convenience to the consumers.

2.1 VALUE ADDITION OPPORTUNITIES IN POULTRY

Poultry farmers can make the following products

MEAT PRODUCTS

A) FRESH BROILER MEAT- this meat is popular. It is kept at 40 C but for less than 24 hours.

B) FROZEN MEAT- this is popular in developed countries and has a lifespan of eight months. Farmers can undertake this with minimum costs through pooling resources in cooperative societies

C) BONELESS PRODUCTS - easy to cook and popular with middle-class citizens.

D) SEMI-COOKED MEAT PARTS can be sold in supermarkets, hospitals, schools and hotels.

E) FULLY COOKED MEAT – farmers can sell chicken roasting points (grills) to restaurants.

F) SEASONED OR MARINATED PRODUCTS- marinating takes about 72 hours and is popular in most restaurants; the meat is juicy and has an aromatic taste.

G) CHICKEN PARTS OR PORTIONS. These are quite popular and include drumsticks, thigh, wings, breasts, breast halves, poultry halves, winglets, drumsticks, breast quarters, leg quarters, legs (drumstick & thigh), gizzards and necks. They can be packed and sold to supermarkets as fresh or frozen cutups.

H) BLOOD – can be dried and sold as fish meal, while feet and heads are packed and sold as pet food.

FIGURE 11: Sales Opportunity in a typical Local Market

EGG PRODUCTS.

Eggs may be sold either as table eggs or processed into egg products that go into a wide range of food products, including soups, sauces, cakes, biscuits and desserts. The eggs are broken to prepare the value-added products, and the liquid is filtered, mixed, and stabilised. Blend and pasteurise the mixture to kill pathogens before cooling it into liquid form. Then freeze or dry into a powder. The mixture is then packed as a liquid, frozen or dried powder. The egg powder has a lifespan of four years. Preparing a meal involves mixing two tablespoons of egg powder with one tablespoon of water and cooking.

OTHER PRODUCTS

I) FEATHERS - can be dried and used as a fire source, making furniture cushions and pillows.

II) POULTRY MANURE- used for improving soil fertility. It is a rich source of nitrogen and phosphorus. It can be sieved, packed and sold in kilograms.

III) Minced meat, sausages, chicken soup, bones for calcium, buttons, and animal feeds.

3. CLOSING SESSION

- Give farmers time to ask questions and respond to the questions. If there are some questions you cannot answer, write them down and refer to the Extension worker and give feedback in the next session.
- Go back to the objectives, ask farmers to explain what they have understood on each of the objectives, and close the session by asking questions. These questions go a long way in assessing the effectiveness of this session

MODULE 6: RECORD KEEPING

DURATION	1 hour
METHODOLOGY	Plenary/Presentation/Discussion
REQUIRED MATERIALS	• Flip chart and markers. • Fact sheets • Visual aids

PREPARATION

1. The facilitator should read and understand the training content before delivering it to farmers.
2. Ensure group discussions are timed to prevent participants from getting into long monologues.
3. Engage in active listening
4. Ask for information and opinions in a way that gets relevant, honest and appropriate responses
5. Use and interpret non-verbal communication; facial expressions, body movements and physical contact
6. Provide constructive feedback to others.

LEARNING OBJECTIVES

By the end of the session, farmers should be able to:

1. Explain the importance of keeping records
2. Identify which types of records are necessary to keep
3. Use a notebook to record

1. IMPORTANCE OF RECORD KEEPING

Accurate record-keeping is essential to enable the farmer to monitor the day-to-day performance of a batch of chickens. It is prudent to say, "you cannot record what you do not measure, and you cannot manage what you do not record". Accurate records also enable forecasting and cash flow projections to be made. They also serve to provide an early warning of potential problems.

Essential parameters to record on a daily, weekly or monthly basis include:

Production records:

- flock size,
- mortality *(clinical signs and/or suggested cause)* - flock statistics
- general laying ability/ percentage lay *(number of eggs per clutch)*
- number of clutches per year
- number of chicks hatched
- number of chicks reared
- age of chicks/chicken
- vaccination and other treatments applied *(when and with what).*

Income records:

- number of chickens and eggs sold
- number of chickens and eggs consumed at household level
- number of chickens and eggs given to or from the flock
- Other sales e.g. empty bags, manure

Expenditure records:

- Feed - types, cost, brand, consumption
- Vaccines - types, cost, batch number
- Drugs
- Disinfectants

2. EXAMPLE OF RECORDS KEPT IN POULTRY FARMS

GOFRAVAS FARM, OSIELE, ABEOKUTA, OGUN STATE
PRODUCTION RECORD CHART

Bird Type ..... Strain .....

Hatchery ..... Date of Stocking .....

Date	Day	Opening Stock	Mortality	Stock Balance	Qnty. of Feed (kg)	Medication (drug use and mode)	Vaccination (type and mode)	Remarks
	1							
	2							
	3							
	4							
	.							
	.							
	.							
	30							
	31							
	32							

3. CLOSING SESSION

- Give farmers time to ask questions and respond to the questions. If there are some questions you cannot answer, write them down and refer to the Extension worker and give feedback in the next session.
- Go back to the objectives, ask farmers to explain what they have understood on each of the objectives, and close the session by asking questions. These questions go a long way in assessing the effectiveness of this session

NOTES:

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