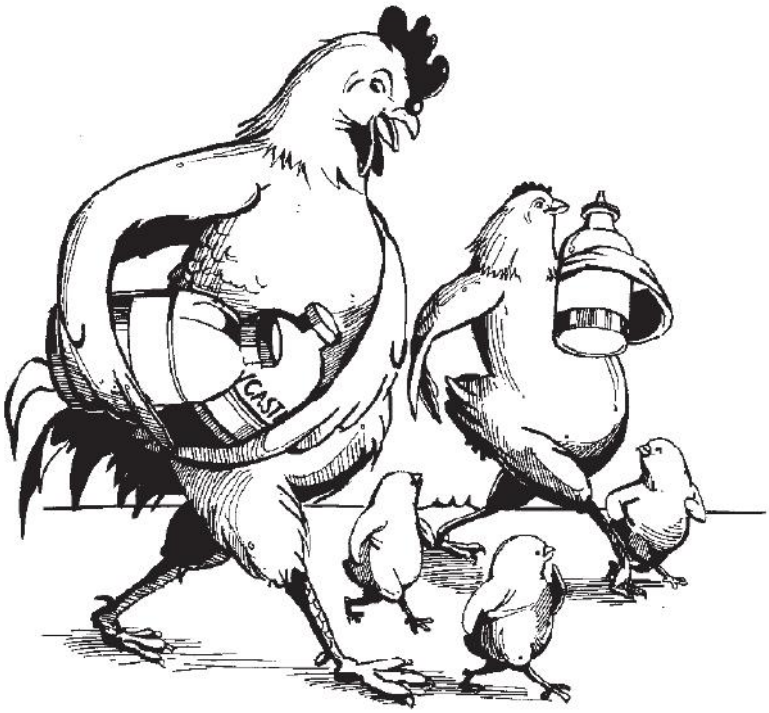
Republic of Zambia
Ministry of Agriculture and Livestock
Department of Veterinary Services

Controlling Newcastle Disease in Village Chickens



A Training Manual
For Trainers of Community Vaccinators

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April 2015

INTERNATIONAL RURAL POULTRY CENTRE
AN INITIATIVE OF THE KYEMA FOUNDATION

Australian Government
Aid Program
An Australian Government initiative in Africa

This manual has been adapted from the original version of the manual:

Alders, R., dos Anjos, F., Bagnol, B., Fumo, A., Mata, B. and Young, M. (2002) Controlling Newcastle Disease in Village Chickens: A Training Manual. ACIAR Monograph No.86

Further information is available from the International Rural Poultry Centre website: www.kyeemafoundation.org/ruralpoultry

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ACKNOWLEDGEMENTS

Sincere thanks go to the many farmers, extension workers and veterinarians who have shared their experiences in training sessions in various parts of the world.

We wish to acknowledge the support given to our work by the Director and staff of the National Veterinary Research Institute in Mozambique. Special thanks go to Mr Razac Chame for his patience and artistic excellence. Support provided by the Australian Centre for International Agricultural Research (ACIAR) to the authors to conduct research into the control of ND in village chickens is gratefully acknowledged. Encouragement and guidance given by Dr John Copland formally of ACIAR and Professor Peter Spradbrow formally of the University of Queensland is much appreciated. Thanks go to Dr Fallou Guèye, Dr Daan Vink, Mr Peter Lynch and Dr Julia de Bruyn for assistance with the editing of this manual.

Thank you also to the CVL staff who assisted in the development of this manual.

ABBREVIATIONS

ACIAR	Australian Centre for International Agricultural Research
ºC	Degrees Celsius
FAO	Food and Agriculture Organisation of the United Nations
I-2	Thermotolerant, live, avirulent ND vaccine available for local production
mL	Millilitre
ND	Newcastle disease
NDV4-HR	Thermotolerant, live, avirulent, commercial ND vaccine
Nº	Number
OHP	Overhead projector
TM	Trade mark
ZMK	Zambian Kwacha (in April 2015, 1USD ~ 7.331ZMK)
USD	United States Dollar

SECTION 1

BEFORE THE TRAINING COURSE BEGINS

1.0 GENERAL INTRODUCTION

1.1 Introduction

Controlling Newcastle disease (ND) in village chickens can make a significant and positive contribution to the lives of people in rural areas. To ensure that ND is controlled in a way that will be least expensive to farmers, it is important that farmers themselves learn how to vaccinate chickens against the disease and how to raise their chickens in a way that is more likely to keep them healthy.

The training of community vaccinators is just one part of a comprehensive ND control program (Figure 1). The vaccination of chickens must be accompanied by appropriate organisational, training, communication and economic practices. Training will often also be required for other key personnel in the control program, such as veterinary and extension supervisors at the national, provincial and district levels. This training may consist of workshops and/or the provision of relevant ND control literature. Training of these key support staff should occur prior to the training of community vaccinators.

In order for the control of ND to make a long-term contribution to the wellbeing of village chicken farmers and their families, the control activities must be well-coordinated and ongoing. It is very important to set well-defined long-term objectives and strategies from the beginning as a single vaccination campaign without follow-up will be of little benefit.

This manual aims to assist trainers to enable farmers to become successful community vaccinators against ND. The manual focuses on the use of 'wet' vaccine (i.e. liquid vaccine that has not been freeze-dried) applied via eye drop.

1.2 How to Use This Training Manual

This manual is divided into four sections:

1. Section 1 contains information that will assist the trainer to prepare for the training course. It contains an introduction to the topic; technical issues relating to the vaccine; and recommendations for the preparation of the training course.
2. Section 2 contains the training course itself. It provides a step by step guide for conducting a three day training course for community vaccinators.
3. Section 3 deals with follow up activities after the training course. It includes a guide to monitoring and evaluation activities, as well as the ongoing education of community vaccinators after the course.
4. Section 4 contains various appendices associated with the preparation and implementation of the training course, monitoring ND vaccination campaigns and the diagnosis, treatment and control of other common diseases found in village chickens.

COMPREHENSIVE NEWCASTLE DISEASE CONTROL PROGRAM

ND identified as a major constraint	**Start up inputs**
Identify appropriate vaccine - Live or inactivated vaccine? - Thermotolerant or thermolabile?	Training and information
Procure appropriate vaccine - Import - Produce locally	Training and information Laboratory equipment and consumables
Vaccine Quality Control - Efficacy - Potency - Safety	Training and information Laboratory equipment and consumables
Central store of vaccine Central data bases (veterinary and socio-economic)	Training and information Establishment and/or maintenance of cold chain
Distribution of effective vaccine and extension material - Appropriate accounting procedures - Vaccine conservation - Improved husbandry practices	Training and information Establishment and/or maintenance of adequate cold chain to provincial or district level
Informed and motivated support staff (male and female)	Training of - Veterinarians - Subject Matter Specialists - Livestock officers - Extension workers
Informed and enthusiastic farmers (male and female)	Awareness raising of farmers *Training – Community vaccinators*
DEALT WITH IN THIS MANUAL	
Administration of effective vaccine to healthy chickens	Vaccination campaigns well-organised Vaccinators equipped Monitoring system in place
Increased N° of chickens and eggs	
Increased sale of chickens - Money to purchase ND vaccine - Purchase of other livestock - Access to essential household goods, e.g. salt, oil, clothes - Ability to pay school fees, buy books - Payment of small medical expenses - Ability to perform important social, cultural and religious activities	Increased home consumption - Improved nutrition of children, and of pregnant and nursing women - Improved health status of children, and of pregnant and nursing women. - Improved productivity of children and adults

Figure 1: *Components and desired results of a sustainable ND control program in village chickens (adapted from Alders, Spradbrow, Young, Mata, Meers, Lobo and Copland 2001). The large arrow indicates the component dealt with in this manual, i.e. the training of community vaccinators.*

The training course is designed to be conducted in a participatory and open fashion. To assist communication, a range of illustrations have been included in this manual. If an overhead projector is available, we suggest that you prepare overheads from the A4 illustrations contained in this manual. Always have a printed copy of your overhead (or Power Point) presentation for use should the electricity supply fail during your training session. If you do not have a copy of the ND flip chart (see Appendix 1.1), prepare A3 photocopies of the illustrations.

Please note that in this manual the borders of the boxes containing text varying according to whether they contain:

1. Objectives
2. Quotes from others
3. Tips from the authors

The following figures also indicate various activities that the trainer should undertake with the course participants:

Ask for information from participants or do an activity with them.

Make a list according to information supplied by participants.

Distribute material to participants.

1.3 Technical issues

1.3.1 Type of vaccine

This training manual deals with the administration of the liquid I-2 thermotolerant live ND vaccine via eye drop. This vaccine can be held for up to two weeks outside the refrigerator without losing its activity, but it must be stored in a cool, dark location. In research trials, eye drop administration was preferred over other routes by most village chicken farmers because it provided the best level of protection and was less expensive because it does not have to be given as often (Table 1).

TABLE 1: COMPARISON OF ROUTES OF ADMINISTRATION OF THERMOTOLERANT LIVE ND VACCINES ACCORDING TO THE FREQUENCY OF ADMINISTRATION AND THE DEGREE OF PROTECTION.

Route of administration	Nº. of applications per year	Degree of protection
Eye drop	3	High (80 %)
Drinking water	5	Medium (60 %)

Eye drop administration provides the best protection because after administration, the vaccine passes to the Harderian gland just behind the eye. The Harderian gland in chickens is a key organ in the development of the immune response. With eye drop administration a large amount of the vaccine virus enters the Harderian gland and so a strong immune response is stimulated.

Further technical details may be found in 'Controlling Newcastle disease in village chickens: a field manual' (Alders and Spradbrow 2001) and 'Controlling Newcastle disease in village chickens: a laboratory manual' (Young, Alders, Grimes, Spradbrow, Dias, da Silva and Lobo 2001) published by ACIAR.

1.3.2 Storing the Vaccine in the Field

Thermotolerant live ND vaccine can be held for up to two weeks outside the refrigerator prior to use but it must be stored in a cool, dark location where it will not experience wide swings in temperature. The table below provides a general guide.

Conservation T°	Wet I-2 vaccine
2 – 8 ºC	4 months or until expiry date on label (whichever is sooner)
22 - 29 ºC	2 weeks
30 - 37 ºC	2 days

As a general rule, distributors and community vaccinators should try to use the vaccine as soon as possible once it leaves the refrigerator.

1.3.3 Transporting the Vaccine

If the areas where you are working are sufficiently wealthy, you may decide to issue participants with a cool box to transport the vaccine. To make this decision ask yourself three questions:

1. Is there a local source of ice or a freezer where ice packs may be frozen?
2. Can the vaccinator afford to buy a cool box after the project finishes?
3. Are cool boxes available for purchase locally?

If the answer to any of these questions is "no" then it is recommended that you do NOT provide cool boxes. It is best for vaccinators to learn how to use containers that are locally available to keep the vaccine relatively cool, e.g. wrapping the vaccine in a damp cloth and placing it into a covered open weave basket (see section 3.3.1).

NOTE: The fewer the physical and financial inputs provided by a project, the more likely it is to be sustainable.

1.3.4 Number of Doses of Vaccine per Dropper

The number of doses of vaccine per dropper is an important issue to consider. Most rural families keep only a small number of chickens and would like to buy the vaccine in small doses. Unfortunately it is not possible to produce vaccine droppers containing a small number of doses cheaply. A large part of the costs of producing vaccines are associated with the containers they are stored in. The vaccine itself is relatively cheap. Consequently, the price per dose increases as the number of doses per vial decreases.

A balance must therefore be achieved between producing vaccines with a small enough number of doses to be practical for use with village chickens and producing a vaccine that is not too expensive for farmers to afford. Research in rural villages has suggested that it is possible to to vaccinate 300 chickens in a short period of time. The vaccine has therefore been produced in 300 dose droppers, which results in a low cost per dose of the vaccine. Always read the label of the dropper to confirm the number of drops (doses) it contains.

1.3.5 Avian Influenza

Avian Influenza (i.e. Bird Flu) in chickens provokes very similar clinical signs to ND and can cause high mortality within a few days. The major difference between Avian Influenza and ND is that Avian Influenza can infect people causing severe respiratory disease and even death.

If chickens that have been vaccinated against ND start to suffer high mortalities, then it is important to be very careful as they may be infected with Avian Influenza. The control of ND facilitates the rapid detection of Avian Influenza. Poultry farmers should isolate sick chickens, bury dead chickens, wash their hands with soap and send an urgent message to the local veterinary assistant.

More information on Avian Influenza is available from the Central Veterinary Research Institute, Animal Vaccines Production Unit, P.O Box 33980, Lusaka, Zambia.
Tel. 211 213444, Fax 211 845608, E-mail: cvri@zamnet.zm

1.4 Other material on ND control

A range of material that complements this manual is available in English. Further details on each item are available in Appendix 1.

2.0 PREPARING FOR THE TRAINING COURSE

2.1 Qualities of a Good Trainer

Your training course will be successful if you can -

- **Be well prepared** – Have a good knowledge of the training material you will be presenting. Make sure that the facilities are suitable and logistics, such as transport, accommodation and allowances are well organised. All of the training materials and resources should be prepared beforehand, including chickens for practical sessions. In this way, the course will run as smoothly as possible with minimal distractions and both you and the participants can concentrate on the material to be presented.
- **Communicate easily with trainees** – be relaxed and be aware of the social and cultural issues that may impact on field work and training. The trainer should use terms and expressions that are easily understood by the trainees.
- **Have a balanced number of male and female trainers** – Male and female trainers are important role models in rural community. It is essential that women farmers recognise that the education of women and their contribution to society are valued.
- **Be a facilitator not a teacher** - the role of the trainer is to assist the participants to acquire the knowledge they need to successfully implement ND vaccination campaigns. The trainer need not be an expert in ND control to be able to conduct basic training sessions for community vaccinators using the program outlined in this manual. When the trainer is unable to answer a question raised by a participant, it is acceptable to say 'I don't know' and then inquire if anyone else in the group knows the answer. If no one is able to answer the question, the trainer should offer to find out the answer and then pass the information on to the vaccinators as soon as possible after the training session.
- **Respect the knowledge held by participants** – have respect for the skills and experiences of trainees, and the knowledge of village chicken farmers. When checking that your messages are being received clearly, ask your questions in a positive manner. For example, say 'Did I explain that clearly?' rather than 'Did you understand that?'
- **Keep eye contact with the participants** – do not talk with your back to them while you are writing on a board or flip chart.
- **Be interesting** – show an interest in what you are saying and make it more like a story. Speak clearly and loudly but not too fast. Ask participants if they can understand you clearly and encourage them to ask questions when something is not clear.
- **Write clearly** – when you write on a flip chart or white board, form your letters and numbers clearly so that everyone can read what you have written.
- **Be enthusiastic –** have enthusiasm for teaching and for ND control activities. Enthusiasm is contagious!

2.2 How Adults Learn

The methods used to bring about long lasting learning in adults are quite different from those commonly used to teach children in schools. Adult learners have different experiences, perceptions, problems and needs, and training courses will be more effective if trainers understand how and why adults learn. The points described here are not only relevant to trainers working with extension workers or community vaccinators, but should also be applied by extensionists and vaccinators working with rural families.

The adult learning process incorporates three important principles that should be remembered when running a training session. These are discussed briefly below and suggestions for running effective training programs given.

(1) Adults bring a lot of experience with them to training sessions and they therefore have something to contribute and something to lose.

- Adult learning is unique to each individual. Everyone learns at their own pace and in their own way.
- Adults value their own experience and do not want to be treated as stupid or ignorant.
- You cannot force an adult to change.

Suggested practices:

- Adults want to test what they learn with what they already know. Encourage participants to answer questions from their own experience as village chicken farmers.
- Do not just present information as 'truth'. Use people's different experiences to encourage questioning and discussion so that they can arrive at the truth for themselves.
- Adults do not want to risk looking stupid. Treat everyone equally and respect their input and ideas. If someone makes a mistake treat it as a means to create discussion and so enable learning.
- For learning to occur, material has to be provided in manageable steps. Adults need to understand as they learn and gradually come to master a task.
- Adults want feedback on their progress and how they can improve. However, do not be overly critical, as positive reinforcement is also needed when you are first trying out a new task.

(2) Adults prefer to focus on real life, immediate problems rather than on theoretical situations.

- Adults see learning as a means to an end, rather than an end in itself.
- Learning is voluntary. Adults only learn what they want to learn and do what they want to do. What they learn must have personal meaning and be of direct or immediate value.

- In most cases, it will be many years since adults have sat in a classroom. Most will also be unaccustomed to having theoretical material presented in a written form.

Suggested practices:

- Provide useful information that is relevant to their need to control ND in their chickens. Adults would rather focus on current issues, rather than material that may be useful in the distant future.
- Tell participants about the purpose and benefits of the session, and about the process you intend to follow. That way they will know what is in it for them.
- Summarise and review regularly so they can see that progress is being made.
- Keep theoretical sessions as short as possible, certainly under 40 minutes, and alternate with practical sessions.

(3) Adults are accustomed to being active and self-directing

- The best learning is based on experience.
- Most adults like to work with others. Aim for a cooperative process that supports sharing of experiences.

Suggested practices:

- Participation needs to be encouraged, supported and expected. Do not embarrass participants, but do not let them hide either.
- For learning to occur, adults have to do things. They must get involved and work at tasks and exercises. They learn by doing and making mistakes and then discovering solutions for themselves.
- Adults want to be consulted and listened to. Although trainers need to give direction at times, this should be the exception rather than the rule.

In summary, treat community vaccinators with respect. Encourage discussion and participation. Rather than being the 'teacher' with all the answers, try and be the facilitator who helps the community vaccinators to learn for themselves. Both you and they will then have a much more rewarding and enjoyable training session.

2.3 Participation

The people involved in a project will determine if it a success or failure. The participation of all stakeholders in contributing to and learning from the project is fundamental to its success. This means that all stakeholders should have regular opportunities to discuss and make decisions about the vaccination program. They should be able to discuss:

- How to work together to plan the vaccination campaigns;
- How best to implement the campaigns;
- What aspects are functioning well and what needs to be improved; and
- Why problems exist and how to solve them.

All the people involved in a vaccination campaign should have the opportunity to discuss and contribute to the work including:

- Village farmers and especially women (not just the village leaders);
- Other community members;
- Village leaders including influential women;
- Agricultural and other relevant committees;
- Women's groups;
- Community vaccinators;
- Village and ward extension officers;
- Livestock and veterinary officers; and
- The vaccine producer and distributors.

2.3.1 Encouraging the Participation of Women

- Encourage the participation of women as they are important role models and increase women's self-esteem and the awareness that women are competent;
- Encourage the participation of women in discussions that take place during the training sessions;
- Training should be organised in short, regular bursts and not run for the entire day and should be located in the village rather than at provincial training centres;
- Training methodologies must take into account the high levels of illiteracy among rural women. Although participants will need some basic literacy skills to record vaccination details, visual aids and practical sessions should be used as much as possible;
- Information imparted in short training sessions over a longer time period is more easily remembered. Repetition and revision are also important;
- When new information is introduced which relates specifically to women's areas of work, it is particularly important to ensure that women are given control over this information. Veterinary training is one such area, because women are responsible for small livestock. Where this training and information is provided to men, there is a risk that women will not receive the information necessary to help them improve their practices; and
- Experience has shown that vaccination campaigns are more successful when women as well as men are involved in all stages of the work.

2.4 HIV/AIDS

AIDS, or Acquired Immunodeficiency Syndrome, and the virus that causes this disease, Human Immunodeficiency Virus (HIV) has become a major worldwide epidemic but is especially serious in Sub Saharan Africa.

To help combat this disease it is important that all training programs include a section on HIV/AIDS and its control. We also recommend that all participants and trainers receive condoms and information relating to HIV/AIDS in the training material that is handed out. The Health and Agriculture Ministries (and their related District Offices) should also have information and pamphlets relating to HIV/AIDS.

HIV/AIDS affected households should be encouraged to participate in ND programme. Chickens require the lowest capital investment of any livestock species and they have a short production cycle. They also play an important role in households where there is a lack of able-bodied workers, such as households affected by HIV/AIDS or those that have a disabled family member. In households headed by widows, children or grandparents, chickens represent the easiest species to raise for sale and home consumption, providing a source of high quality protein and micronutrients which play an important role in the nutrition of people living with HIV/AIDS.

Eggs, in particular, offer a great nutritional bargain: they contain approximately 315 kilojoules and are one of the best quality protein sources known. Eggs also supply an array of vitamins such as A and B12, and they are one of the best food sources of vitamin K, a bone-boosting nutrient. Eggs also provide choline, a B vitamin that plays a role in brain development. In addition, eggs can be stored for several days under village conditions and require very little energy or time to cook.

2.5 Group Size and Composition

Keep the size of the training group small; say around 10 to 12 participants and definitely not more than 20 participants. In this way you will be able to pay close attention to the needs of each participant. This is particularly important if only one trainer is running the course. If a class is too large, some trainees will not fully participate and will not receive the personal attention needed to properly understand the material.

It is also advisable to include the extension workers or livestock officers who will be supervising the community vaccinators in the course. This will ensure that there is a common understanding between vaccinators and supervisors. It will also enable them to jointly plan their activities for the coming year during the course. Vaccinators, extension workers or livestock officers will get to know each other and can agree on the type of supervision, monitoring and evaluation that should take place after the course.

2.6 Selecting Community Vaccinators

Community vaccinators may be men or women and should be selected in collaboration with the community. Local associations, e.g. farmers' associations or women's groups, may also wish to have a representative included in the training course. It is highly recommended that at least half of the vaccinators be women. As a participatory exercise, the characteristics of the vaccinators should be identified together with the community in a meeting involving both male and female farmers.

The following should be some of the characteristics discussed:

- Respected by the community, dynamic and a good communicator;
- Able to work with both male and female farmers and different groups within the community;
- Able to travel the distances required to purchase vaccine and vaccinate chickens;
- Able to read, write and do basic calculations with numbers to monitor vaccination activities (this aspect should be assessed as a basic condition for selection); and
- A village chicken farmer – protecting his/her own chickens from ND will provide the community vaccinator with a substantial economic incentive.

2.7 Selecting the Training Venue

The location of the training will depend on who is being trained and the logistics involved in getting the participants together.

If the training cannot be held in the village, then you may need to arrange child care facilities as women very often have young children.

Chickens are required for many of the practical sessions. It is best if the training can be done in a village or near to a village so that village chickens can be used in the practical sessions. Using village chickens also provides an opportunity to practise communication with village chicken farmers.

2.8 Selecting the Appropriate Time of Year for the Training

The timing of the course is very important. Always allocate sufficient time between the training course and the first vaccination campaign. Participants need around one month to mobilise and make arrangements with the village chicken farmers prior to the first campaign.

Try to hold the course:

- When male and female farmers are less busy with other agricultural and/or off-farm activities;
- When climatic conditions will allow access to the area where the training is to be held; and
- Well before the period when ND outbreaks are most common.

An ideal time to hold a training course would be around 4 to 6 weeks before a planned vaccination campaign. This will give the trainees sufficient time to prepare for the vaccination campaign, while it also ensures that trainees can start applying what they have learned immediately after the course. If there is too long a gap between training and using the skills learned, then trainees could forget some important aspects of vaccination.

2.9 Preparing for the Training Course

It is important that you allow sufficient time to prepare the course. Ensure that all relevant authorities and interested parties have been informed about the course and are supportive of initiatives to control ND in village chickens. Local representatives of veterinary and extension services should be invited to attend the course. If they are unable to attend the entire course, try to ensure that they can participate for at least a short time to be introduced to the participants and discuss how the community vaccinators will be monitored and their activities reported. Ensure that key supervisors and decision-makers are well informed about the ND control program and its objectives. In many cases, it may be necessary to provide training and/or background information for them prior to training community vaccinators.

To prepare for this course -

- Use the checklists at the back of the manual to assist with the purchase of training materials (Appendix 2) and components of the vaccinator's kit (Appendix 3).
- Ensure that you have copies of the flip chart for the vaccinators to use when mobilising the community.
- Ensure that you also have copies of the vaccinator's manual in Kiswahili.
- Confirm that accommodation, meals, travel and allowances have been arranged for participants and trainer(s) and are adequate to women's specific needs. Please note that allowances should be sufficient to cover the costs incurred by participants but not overly generous. If you offer large allowances you may get participants who see an opportunity to make some easy money by attending the course rather than those who are genuinely interested in working in their communities as vaccinators.
- Verify that facilities exist for female participants with children.
- Ensure that participants receive information in advance about their travel arrangements and items that they are requested to provide (e.g. ask them to bring along an example of the container they would like to use to transport the vaccine).
- Practise the material in the manual before you conduct your first training course. Give oral presentations of all the theoretical sections to colleagues and friends and practise the activities to be done in the practical sessions. If you are confident that you are capable of presenting all the material, you will be much more relaxed and comfortable when presenting the course.
- During the course you may need to illustrate a point that does not have a corresponding illustration in this manual. If you are not a confident artist, practise drawing the things that you think you may need to illustrate. A simple way to draw a healthy or a sick chicken is given in Figures 2a and 2b to assist those who do not enjoy drawing.
- If you are not using the I-2 ND vaccine, make sure that you get all the necessary information about the vaccine you will be using. Field workers need to know important information such as the storage conditions for a vaccine, how long it can be stored at ambient temperature (i.e. outside the refrigerator), the recommended re-vaccination interval, administration routes, age restrictions and dosages. You will be required to present this information during the course.

- Ensure that you will have adequate numbers of chickens available for participants to practise holding, examining and vaccinating birds. Participants should have the opportunity to vaccinate chickens on both the second and third day of the course.

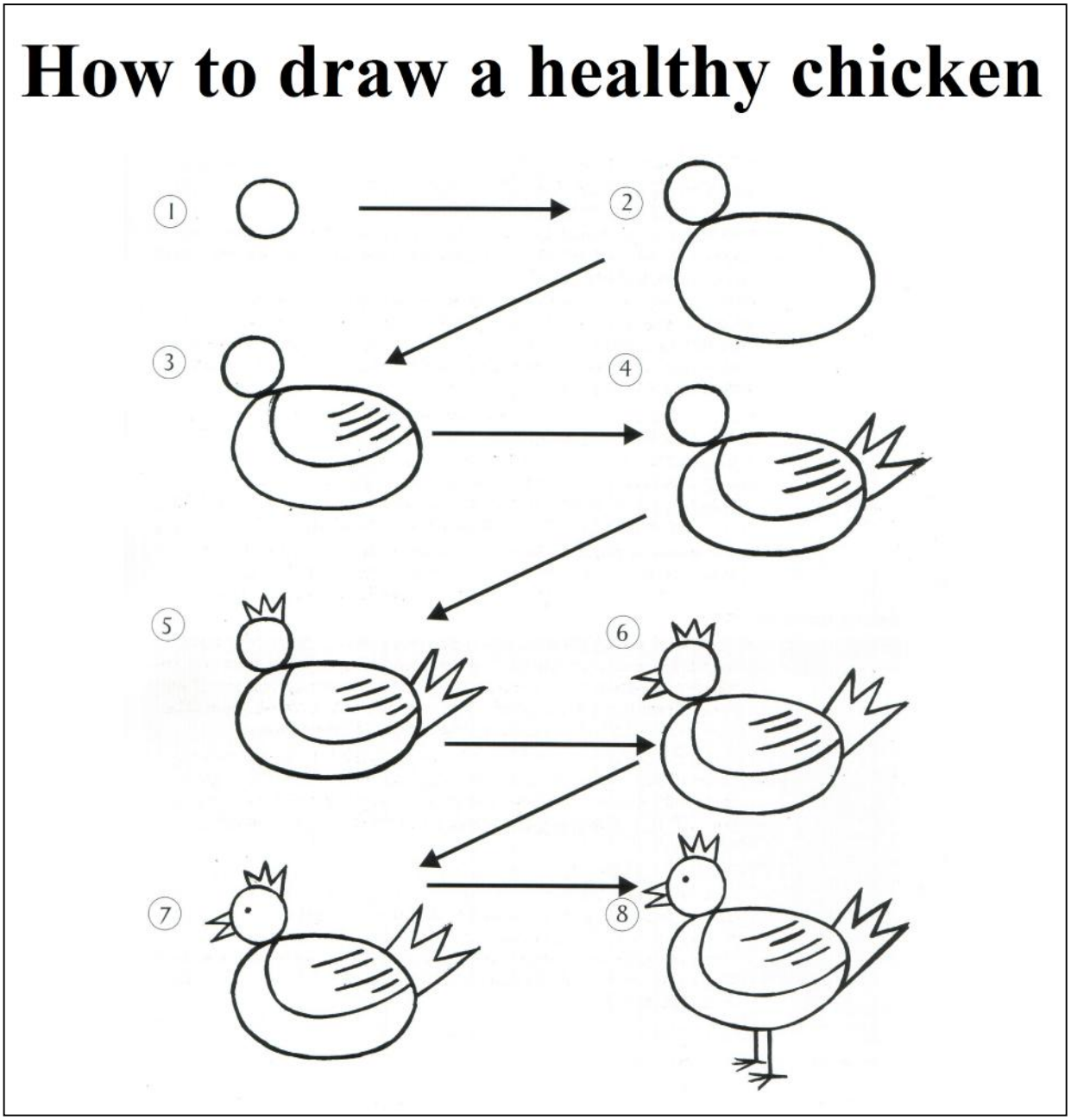


Figure 2a: *An easy way to draw a healthy chicken.*

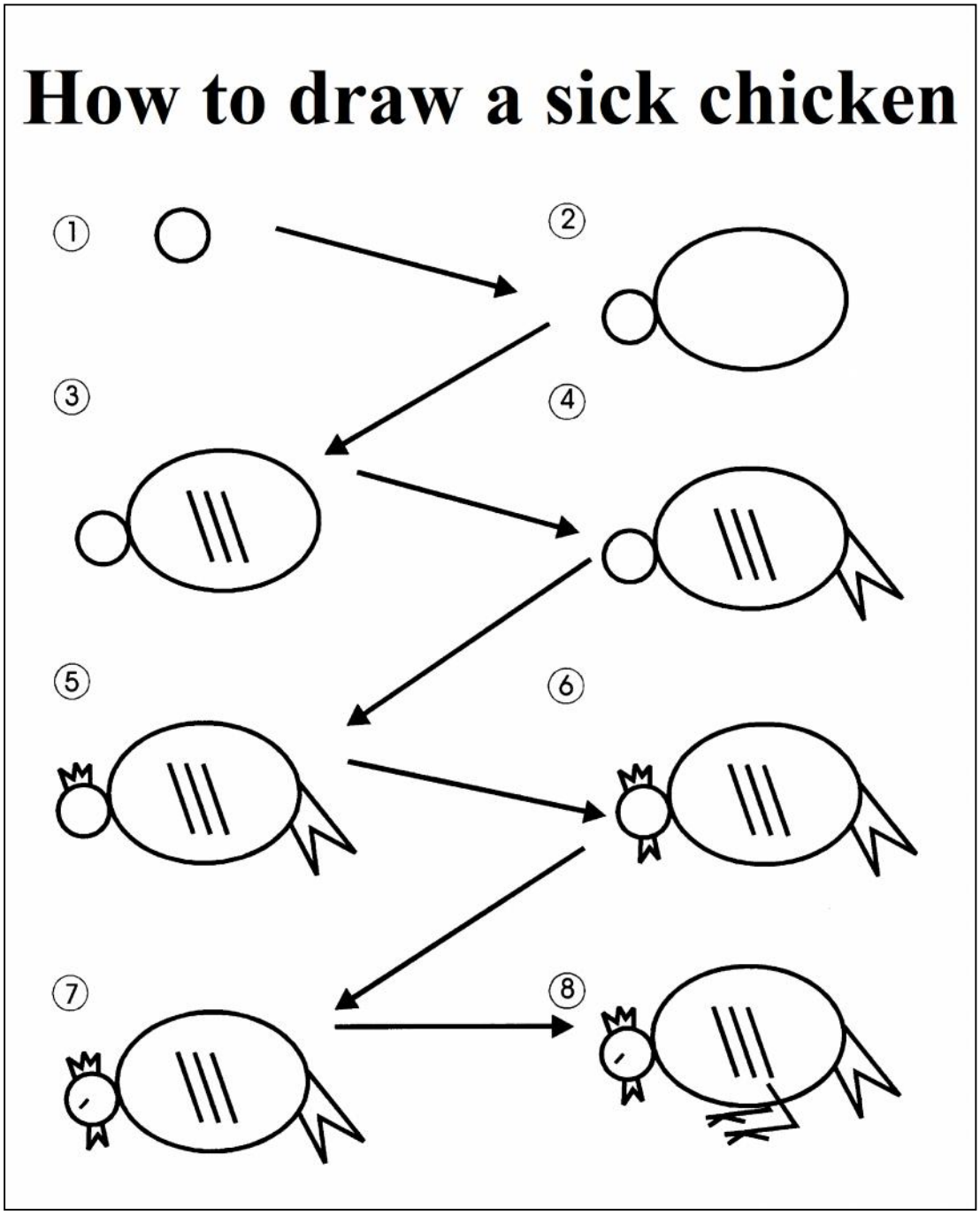


Figure 2b: *An easy way to draw a sick chicken.*

2.10 Selecting the Language of Communication

It is ideal if the trainer(s) speaks the language commonly used by the participants. If for some reason, the trainer is not able to communicate effectively in the local language, it is best to arrange an interpreter prior to the course.

Meet with the interpreter and provide him/her with a copy of this manual and other material on the control of ND to be used in the training course. Local languages may not always have terms that correspond to technical words and it may take time to arrange clear and accurate translations. For example, many local languages do not have a word for vaccine and it is important that the word for drug or remedy not be used as a substitute. As you are aware, a drug is given to an animal when it is sick. A vaccine is given to a healthy animal to prevent it from getting a particular disease. It is very important that farmers understand that a vaccine prevents disease rather than treats it, and so animals must be vaccinated before they get sick.

2.11 The Training Program

The timetable shown on the adjoining page can be adjusted to indicate the order in which you intend to conduct the training course. The starting time for each session should be completed once you have consulted the participants about the daily program and they have agreed on the times that best suit them. Allow more time if translation is required. Display the program on the wall of the training venue where it can be easily consulted. Note however, that the time spent on each session should be flexible according to the needs of the participants and how well they understand each section.

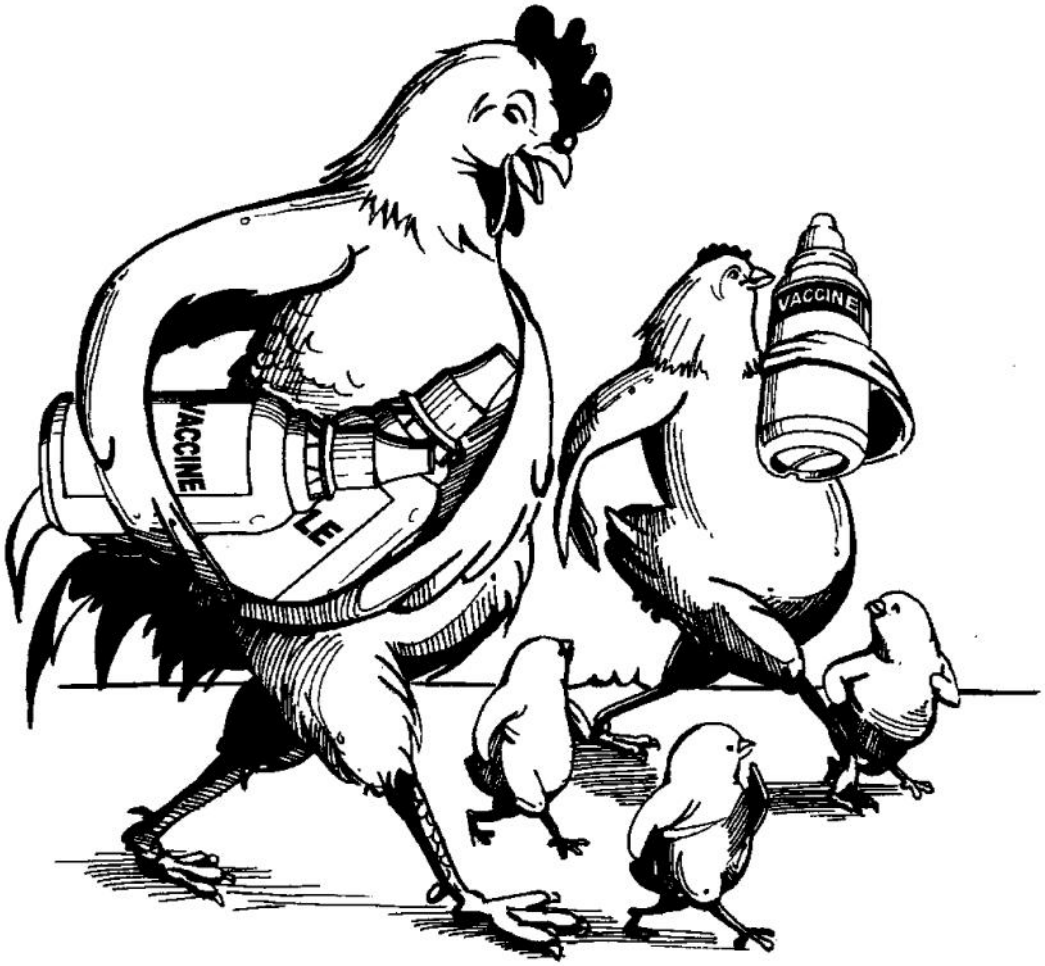
Training Timetable

Time	Day 0	Day 1	Day 2	Day 3	Day 4
1st Session Time:…….		1. Getting started Opening ceremony	5. Introduction to vaccines and vaccination	9. Examining and vaccinating chickens; Comparing vaccine transport containers	Participants depart
…… minutes	Interval	Interval	Interval	Interval	Interval
2nd Session Time:……..		2. Village chickens and community vaccinators	6. Vaccination tools and their use; Working with I-2 ND vaccine	10. Mobilising farmers; Keeping records; and Planning a vaccination campaign	
…… minutes	Lunch	Lunch	Lunch	Lunch	Lunch
3rd Session Time:……..		3. Introduction to Newcastle disease	7.Selling your vaccination service	11. Signs of success	
…… minutes	Interval	Interval	Interval	Interval	Interval
4th Session Time:……	Participants arrive	4. Working with farmers and handling chickens; Using the vaccine dropper	8. Extension material for ND control; other disease control measures	12. Looking ahead; Course evaluation Closing ceremony	

2.12 Before You Start

Remember -

- You are a facilitator not a teacher;
- Encourage all to participate;
- Try not to let any one theme run for more than 40 minutes (a chance to stand up, stretch and relax is important);
- Write clearly;
- Alternate discussion and practical sessions; and
- Most importantly, relax and enjoy the learning and training experience.



SECTION 2

THE TRAINING COURSE

3.0 THE TRAINING COURSE

3.1 The Participants Arrive – Day 0

The trainer should arrive the day before the training course is due to begin to make sure that everything is organised and that no last minute problems or changes have arisen.

If participants need to travel a long distance and there are sufficient funds, organise for the participants to arrive the day before training commences. They will have a chance to rest after their journey, sort out all the administrative issues (such as the payment of allowances, etc.) and get to know their new environment so that they can focus on the training the following day without distraction. Inform all of the starting time the following morning.

3.2 The Course Commences - Day 1

SUMMARY OF THE DAY'S TRAINING AND MATERIALS REQUIRED

Topics to be presented	Duration	Support material	Material for distribution
Session 1			
1. Welcome	5 minutes	None	None
2. Language to be used	5 minutes	None	None
3. Getting to know each other	15 minutes	None	Name tags
4. Expectations of participants	10 minutes	Blank flip chart and felt pens of different colours, adhesive.	None
5. Course objectives	5 minutes	Pre-prepared posters containing course objectives; overhead projector (OHP) or illustrated flip chart.	None
6. Time schedule	5 minutes	Pre-prepared program with blank spaces to add in times	None
Session 2			
1. Distribute basic training materials	5 minutes		Exercise book, pen or pencil
2. Characteristics of a successful community vaccinator	15 minutes	Blank flip chart and felt pens	None
3. Experiences with village chicken production	25 minutes	Blank flip chart and felt pens	None

(continued on next page)

Topics to be presented	Duration	Support material	Material for distribution
Session 3			
1. Characteristics of sick and healthy chickens	10 minutes	OHP or illustrated flip chart	None
2. Clinical signs of ND	20 minutes	OHP or illustrated flip chart	None
3. Traditional remedies for ND	10 minutes	OHP or illustrated flip chart	None
4. How ND spreads	20 minutes	OHP or illustrated flip chart	None
Session 4			
1. How to talk and work with village chicken farmers	10 minutes	Blank flip chart	None
2. How to hold a chicken for vaccination	15 minutes	OHP or illustrated flip chart; Chickens	Chickens (if possible)
3. Using eye droppers	10 minutes	Eye droppers	Eye droppers
4. Discussion about the day's work	5 minutes	Blank flip chart	None
5. Homework	5 minutes	Blank flip chart	None

3.2.1 Session 1 – Getting started

Session Objectives

1. To discuss what language will be used during the training course.
2. To get to know each other.
3. To discuss the expectations of each participant.
4. To outline the objectives of the course.
5. To define starting and finishing times for each day of the course.

Confirm with the participants what language should be used during the course. All being well you will have checked this beforehand and will have an interpreter on hand if necessary.

To help participants to get to know each other, divide the group into pairs and ask them to record the following about their partner

- His/her name;
- Where he/she lives; and
- What his/her experience has been with village chickens.

Each participant is then asked to present what they have learned about their partner. (The trainers can also introduce themselves here.)

 Make sure that you keep a written record of each participant's name, village, educational level, occupation and supervisor's (extension worker's) name and position.

 Ask participants to say what they hope to learn during the course.

 Write these expectations on sheets of paper on the wall or at least record them in a note book if large sheets of paper are not available. You will refer to this list again on the last day.

 Present the objectives of the course (see below) and confirm that participants are in agreement.

 Modify objectives when necessary in collaboration with the vaccinators. Put the objectives up on the wall of the training venue so that the participants may refer to them during the course. Explain that the course will deal with the control of ND (use the local name for ND) in chickens only and that other issues of importance to the community (e.g. water supply, healthcare, education of children, care of domestic animal species other than chickens) will not be discussed. You may offer to present community concerns other than ND control to the relevant authorities.

Assessing reading and writing skills

During the first sessions it is necessary for the trainer to discover the extent of the trainees' reading and writing skills. It can be the case that attendance at school may not necessarily have resulted in the development of these skills. The trainer should incorporate into the first sessions a means of testing individuals for these skills. The trainer may decide on a straight test for these skills, but it is also possible to judge the trainee's ability by participation in joint sessions. FAO 1994

NOTE: By laminating the sheets showing the training timetable and objectives, they can be reused in subsequent courses.

General course objectives

1. To share experiences in the control of ND in village chickens.
2. To learn how to successfully implement ND vaccination campaigns in rural areas.

Specific course objectives

At the end of the training course, each participant should be able to:

1. Identify a healthy chicken;
2. Identify a sick chicken;
3. Recognise the signs of ND;
4. Handle a chicken calmly and safely;
5. Read and check the number of doses of ND vaccine per dropper and the expiry date of the vaccine;
6. Check that the correct number of drops leave the eye-dropper;
7. State how much a dropper of vaccine costs
8. State how much to charge farmers for each dose of vaccine
9. State how to store and transport the vaccine safely
10. State for how long the vaccine can be safely used
11. Explain to other farmers how ND vaccine can assist with ND control in village chickens;
12. Explain other general husbandry techniques that can assist with disease prevention and control;
13. Organise ND vaccination campaigns in collaboration with participating male and female farmers;
14. Record information about chicken numbers, participating households and vaccination dates
15. List the information on ND control activities that should be provided to district extension or veterinary supervisors;
16. Assess the effectiveness of their work as community vaccinators; and
17. Demonstrate a basic understanding of Avian Influenza and how it can be prevented.

 Ask participants to indicate at what times they would like to start and finish the sessions each day. This is particularly important when the training is done in a village as some participants may have other activities that they need to attend to each day. The participants may also decide to elect a timekeeper, a secretary and a participant representative.

 Write the agreed times onto the course timetable (use a water-based felt pen if the timetable has been laminated) and display it on the wall of thetraining venue.

Interval – maybe for morning tea

3.2.2 Session 2 – Village chickens and community vaccinators

Session objectives
1. To distribute basic training materials. 2. To highlight the characteristics of successful community vaccinators. 3. To exchange ideas about raising chickens.

Distribute as appropriate, note books, handouts and pens to the participants.

 Discuss the characteristics of a successful community vaccinator. Ask participants to list the characteristics that would help them to be successful. Stress the following key characteristics:

- Respected by the community;
- Able to work with both male and female farmers;
- Able to travel the distances required to purchase vaccine and vaccinate chickens;
- Able to read, write and do basic calculations with numbers;
- Knowledgeable about ND and how it can be controlled; and
- A capable village chicken farmer – protecting his/her own chickens from ND will provide the community vaccinator with a substantial economic benefit from his/her work.

 Exchange ideas on the production of village chickens. Encourage participants to discuss their experiences with village chicken production, for example:

- What types of chickens do they raise?
- Why do they raise chickens, e.g. for sale; home consumption; or traditional use?
- What type of housing is provided for their chickens, if any?
- What type of food, if any, is provided?
- What problems have they encountered?
- What solutions would they suggest?

 (One of the trainers may wish to record this information)

Interval – maybe for lunch

3.2.3 Session 3 – Introduction to Newcastle disease

Session objectives
1. To recognise the differences between sick and healthy chickens. 2. To recognise the signs of ND. 3. To discuss traditional remedies used in the control of ND. 4. To discuss how ND spreads between chickens. 5. Present information concerning Avian Influenza.

It is very important that we know the difference between sick and healthy chickens because we should NEVER vaccinate sick chickens. Chickens need to be strong and healthy so that they can respond well to the vaccine.

Characteristics of a Healthy Chicken

Ask participants to describe the signs of health in chickens. After making the list together, show them the illustration (Figure 3) of a healthy chicken and use the list below to reinforce the key characteristics of health:

- Head raised;
- Straight neck;
- Clean and smooth feathers;
- Clean vent (posterior);
- Moves easily;
- Bright eyes;
- Strong legs and feet; and
- Crows (sings) well (especially the cockerel).

Characteristics of a Sick Chicken

Ask participants to describe the signs of illness in chickens. After making a list, use the list below to reinforce the key characteristics of a sick chicken while showing Figure 4:

- Drooping head;
- Closed eyes;
- Fluffed feathers;
- Dirty vent (posterior);
- Not moving;
- Legs bent; and
- Stops crowing (singing) (especially the cockerel).

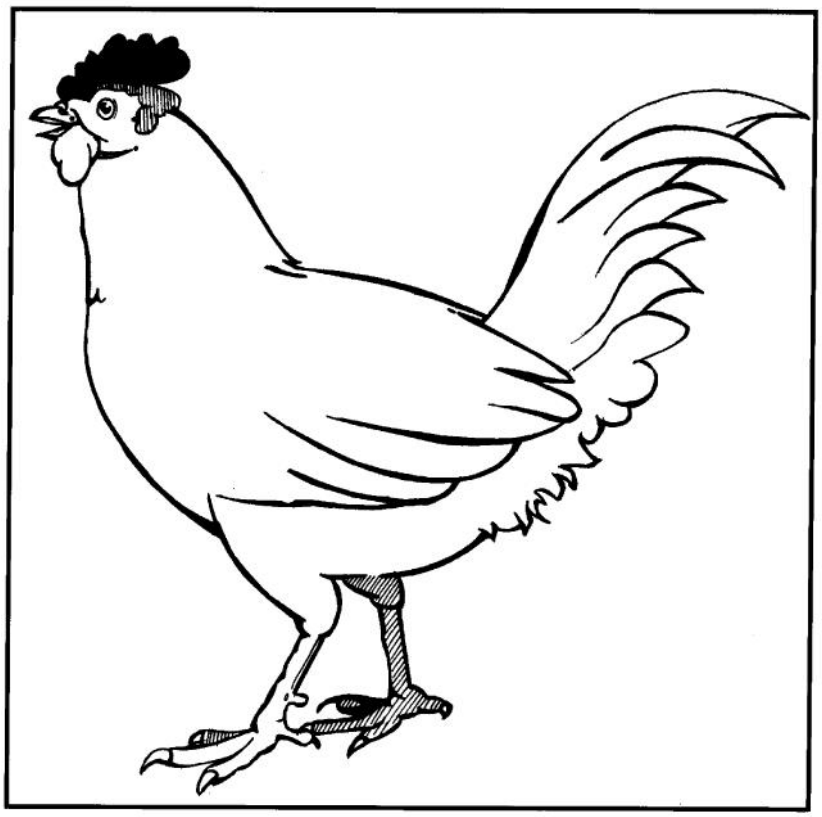


Figure 3: *A healthy chicken.*

Figure 4: *A sick chicken.*

We have just talked about sick and healthy chickens.

 Apart from ND, what are the other diseases that can cause problems in chickens? (Fig 5 - Fig 2 of Flip Chart) Ask participants to name or describe diseases or signs of illness they have encountered in chickens. The vaccine that we are learning to use in this course will control ND only. Chickens might still get sick from:

- External parasites, e.g. fleas, lice, and ticks;
- Internal parasites;
- Gumboro disease (Infectious Bursal Disease);
- Fowl pox;
- Fowl cholera;
- Coccidiosis; and
- Any other diseases of importance in the local area.

 Use the local names for the above diseases and always record the information provided by the participants. This information will help you with your future plans for improving village chicken production.

An Introduction to ND

Newcastle disease is the disease that kills more village chickens than any other disease. Therefore, we need to be able to recognise the characteristics of this disease.

NOTE: When you show illustrations to the participants, ask them to describe what they see in the figure. This is an important step that will ensure that they are interpreting the images in the intended manner. Encourage the participants to use this technique when they are revising material during the course and afterwards when they are presenting the flip chart to farmers.

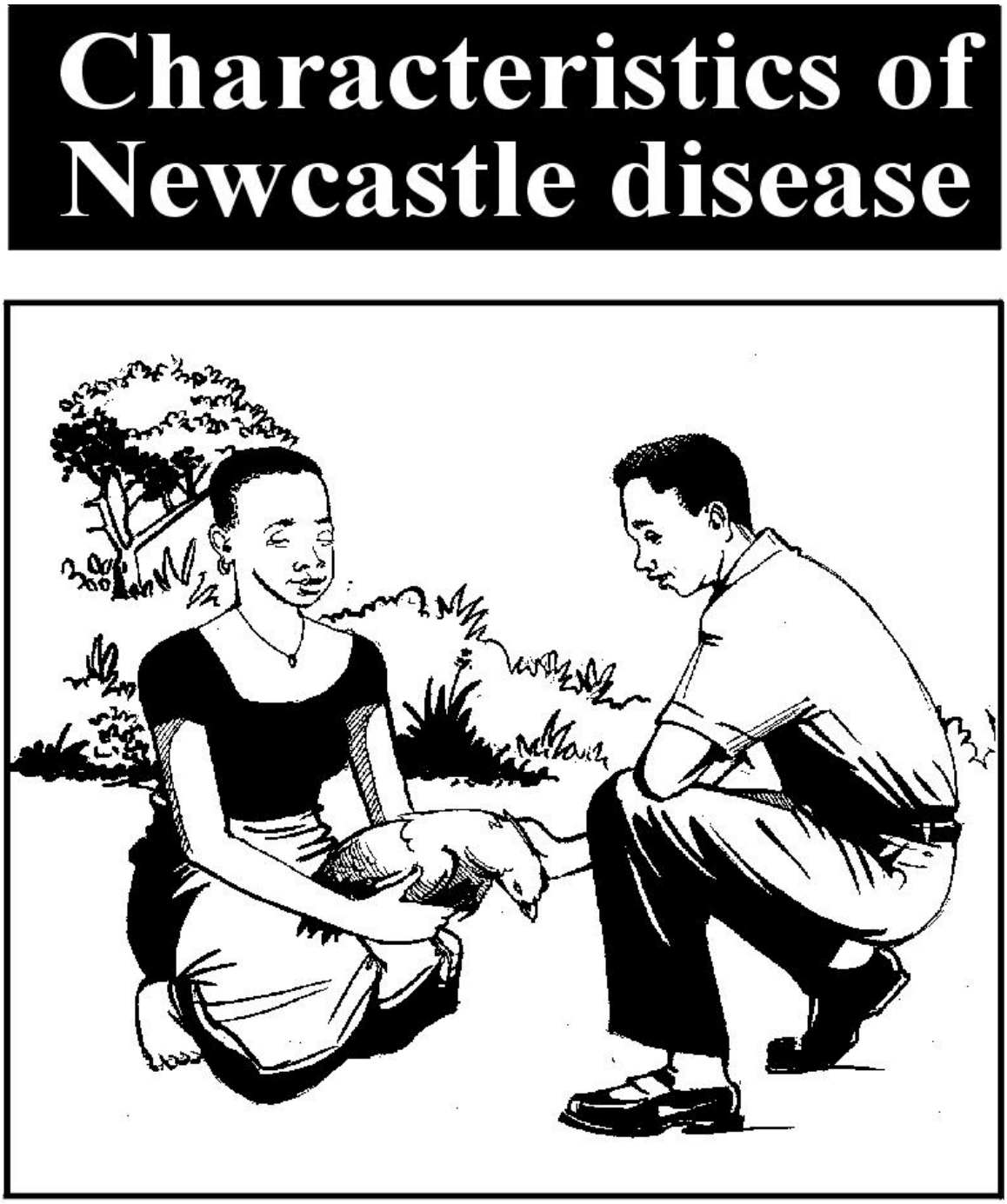


Figure 5: *Characteristics of Newcastle disease.*

Figure 6: *Drooping wings can be an early sign of Newcastle disease.*

How to Recognise ND in a Chicken

Ask the participants to look at Figure 6 and to describe what the see. The chicken has fluffed its feathers and is carrying its wings on the ground. Farmers sometimes refer to sick chickens as "wearing a coat" or "dragging their coats on the ground".

What do the vaccinators see in Figure 7 (Fig 4 of Flip Chart)? Chickens with ND will often have greenish diarrhoea and the feathers around their vents will be dirty.

In Figure 8 (Fig 5 of Flip Chart), participants should describe a chicken with a twisted neck (torticollis) and fluffed feathers. Chickens with these signs often breathe with difficulty.

Participants should note that Figure 9 (Fig 6 of Flip Chart) shows many dead chickens. Ask them what disease can cause so many deaths? Currently in Zambia, ND is the only chicken disease that can cause all ages of birds, both males and females, to die in such large numbers within a short period. However, Bird Flu can also cause many deaths in chickens but no outbreaks of this disease have been reported in Zambia (as of April 2015).

Avian Influenza (i.e. Bird Flu) in chickens provokes very similar clinical signs to ND and can cause high mortality within a few days. The major difference between Avian Influenza and ND is that Avian Influenza can infect people causing severe respiratory disease and even death. Further information on Avian Influenza is available from your local veterinary assistant.

NOTE: It would be advisable to contact the Veterinary Services Department to obtain the correct translation of Bird Flu into local languages. The literal translation of 'Bird Flu' into local languages does not always clearly convey the idea that this disease can cause very high mortality in birds and not just respiratory illness.

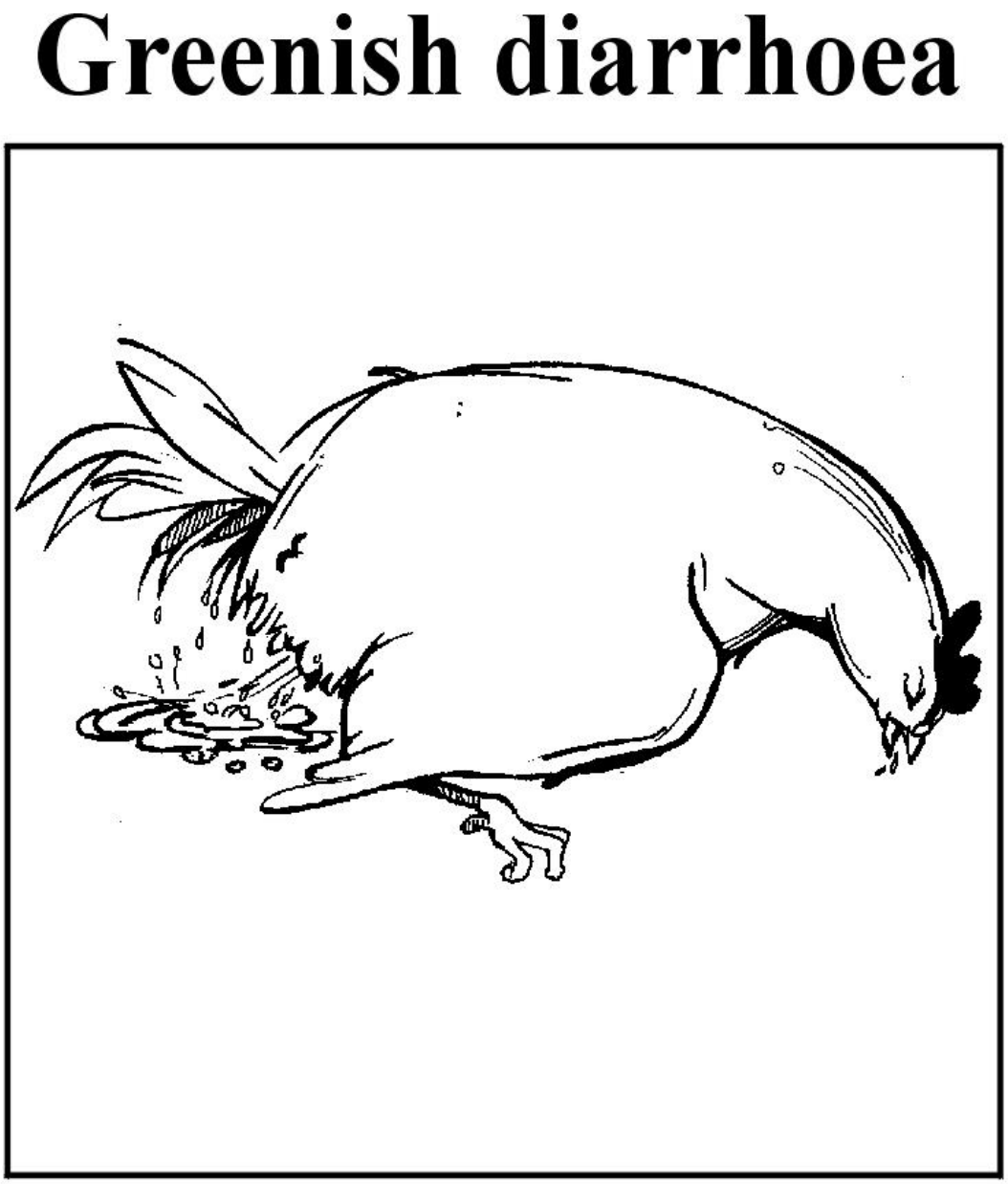


Figure 7: *Greenish diarrhoea can occur with Newcastle disease.*

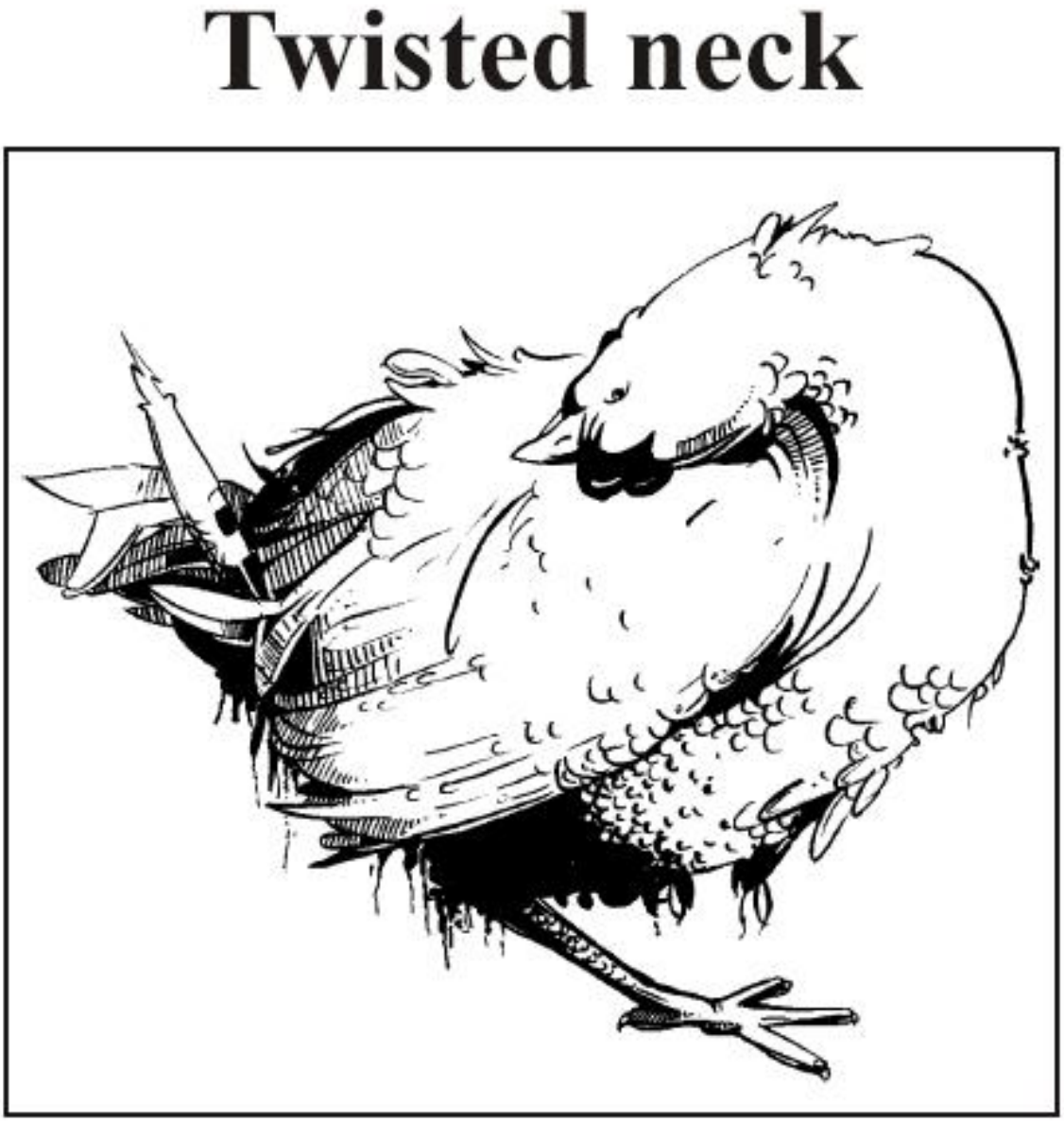


Figure 8: *Chickens can get a twisted neck with Newcastle disease.*

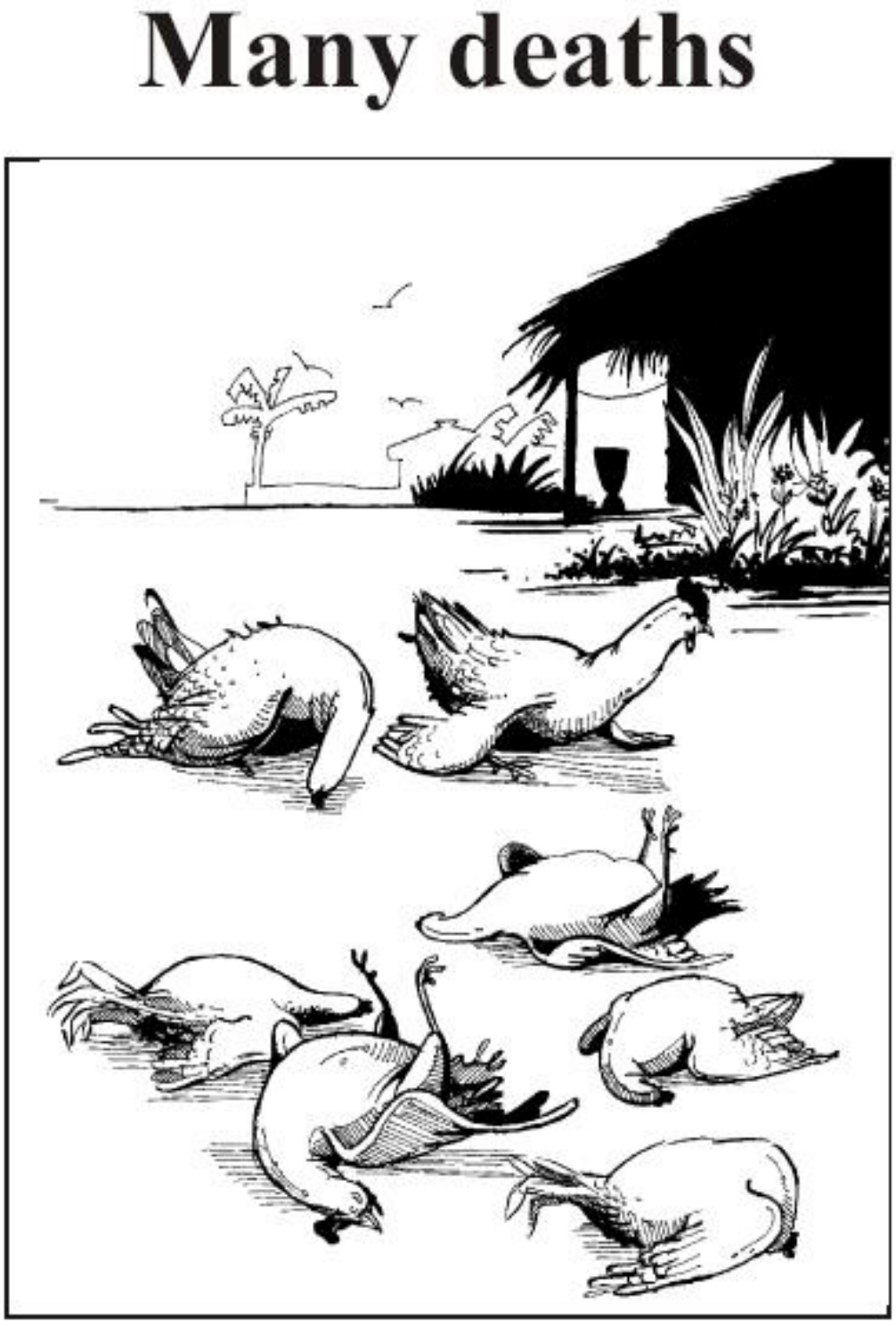


Figure 9: *Many dead chickens are often a sign of Newcastle disease.*

Other Birds That May Get ND

Ask participants if other types of poultry can suffer from ND. What types are shown in this Figure 10 (Fig 8 of Flip Chart)? Turkeys and pigeons can sometimes get ND. Ducks are normally resistant to ND but ducklings (baby ducks) can sometimes die because of it. If you have noticed that ducks of all ages are dying in large numbers, then this is caused by another disease that attacks ducks, and not by ND. Guinea fowls can transmit ND and will sometimes get sick with ND and die from it.

Explain that sometimes certain diseases only cause illness in particular animals. For example, when we get the flu, the dogs or cats around our house will not get the same illness.

10: *Other birds can also be involved in the spread of Newcastle disease.*

NOTE: Turkeys and pigeons can be vaccinated against Newcastle disease using the vaccine for chickens. With the I-2 vaccine, pigeons should receive the same dosage as chickens (one drop in one eye), while turkeys should receive twice this dosage (two drops in one eye or one drop in each eye).

Traditional Treatments Used to Control ND

What can we see here in Figure 10 (Fig 7 of Flip Chart)? We can see a woman, a man and a chicken. The man is holding a tray containing a number of different items. What are they? He is carrying some garlic, some chilli peppers and some washing powder. These are some of the traditional remedies used by farmers in an attempt to control ND. Do the participants know of any others?

Always keep a record of these responses.

Ask the participants if they have ever used traditional remedies. What were the results? Do farmers give the remedy before the birds get sick or when signs of the disease appear?

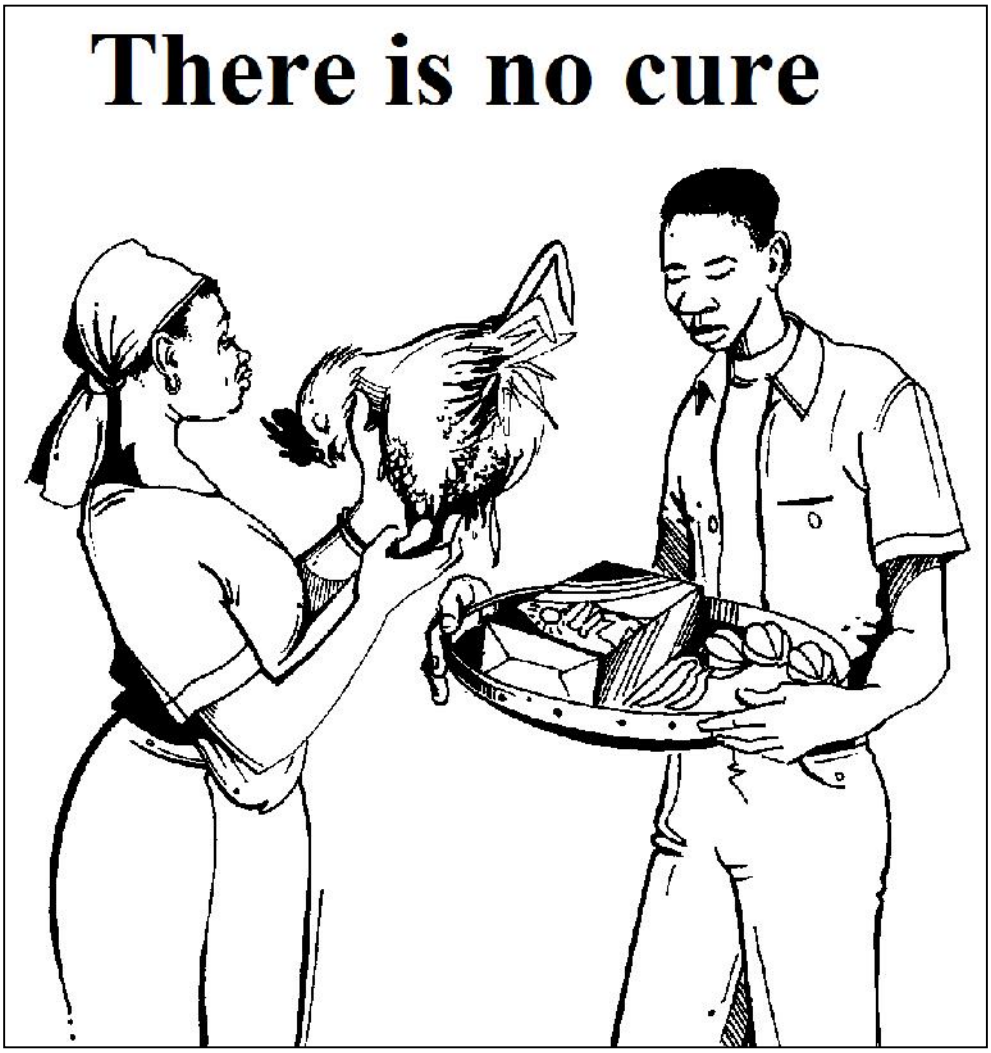


Figure 11: *Many farmers use traditional remedies to treat Newcastle disease but most farmers admit that the treatment is not very effective.*

How ND Spreads from Bird to Bird

Over the years, societies have developed many theories about what causes sickness in people and animals. Some theories suggest that disease is caused by evil spirits or by witchcraft. In parts of West Africa, some people believe that their chickens die in large numbers just before Christmas because God needs them at this time. Some farmers have observed that a sick bird can make other birds sick, but they do not understand how this happens.

 Ask the participants to describe and discuss the ideas of local people about the reasons why people and animals get sick. This is an important issue. We will be better able to help farmers understand the importance of vaccinating their birds against ND if we first understand what farmers believe about why their birds get sick.

Do not discredit local ideas and beliefs. Traditional beliefs have been built up over centuries and generally give an explanation as to why disease appears as it does. Even current scientific theories change with the passage of time as new discoveries are made and certain details better understood.

With the development of new technologies, scientists have learnt that diseases are caused by particles that are too small to be seen without the assistance of special equipment. The small particle that causes ND is called the ND virus. When the virus enters a bird, the bird does not get sick immediately. It takes some days, usually 3 to 5 days (but sometimes 2 to 15 days) for the bird to show signs of illness. During these first few days when the bird does not look sick, the number of virus particles inside it increases rapidly and some particles can leave the bird when it breathes or drinks or passes manure (Figure 11). If other birds come in contact with these particles, then they too will get sick.

The virus that causes ND can vary in strength. Sometimes, the type of virus will cause very few deaths in chickens; sometimes the virus involved may cause many deaths. For example, if a farmer has ten chickens, then –

- Infection with a weak ND virus may cause → 1 out of 10 chickens die.
- Infection with a moderately strong ND virus → 5 out of 10 chickens die.
- Infection with a very strong ND virus → all 10 chickens die.

NOTE: When the community vaccinators have a basic level of education, it may be best to refer to the ND 'particle' rather than the ND 'virus.'

NOTE: If you cannot show Figure 11 as an overhead, draw a chicken on the blackboard or flip chart as was shown in Figure 2a and 2b.

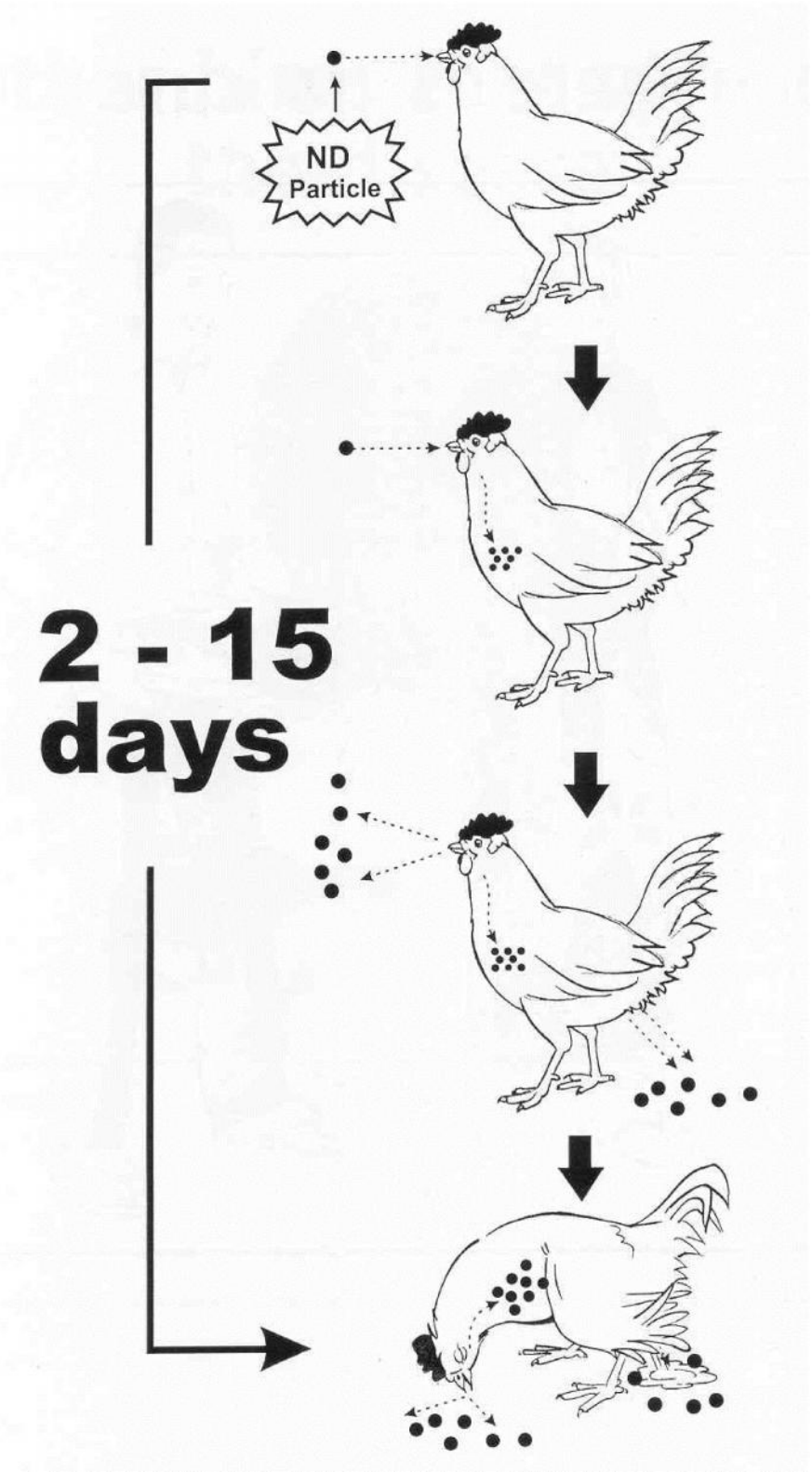


Figure 12: *After contact with the Newcastle disease virus, birds take 2 to 15 days to show signs of illness.*

Figure 13 (Fig 9 of Flip Chart) is slightly complicated and so you will need to explain it part by part. It shows how the ND virus can move from bird to bird.

- In the middle of the Figure we have a healthy chicken with various pictures around it.
- On top there is a chicken with diarrhoea. If ND caused this diarrhoea, then the manure produced by this bird can spread the ND virus.
- Next we have a dog eating a chicken. If this chicken had ND, then the dog can spread the virus around by carrying the body to a different location and distributing the uneaten parts (e.g. feathers).
- There are some eggs. If the egg has contact with a chicken sick with ND, then the ND virus can sit on its surface and be carried along with the egg. It has not been shown that the ND virus can be transmitted through the inside of the egg.
- A car that passes through an area where an ND outbreak is occurring could carry the ND virus.
- Chicken organs, feathers, bones, intestines and feet that have not been cooked can all carry the ND virus if they come from a sick chicken.
- The man in the figure could also transport ND virus on his shoes.

Because the ND virus is so small, it could contaminate all of the above items and we would not know until chickens in a new area start to die.

 Ask participants to name other items that might carry the ND virus from an infected area. They may mention chicken baskets, ordinary baskets, car and bicycle tyres, etc.

The Role of Humans in the Spread of Newcastle Disease

In areas where the movement of birds is not controlled, farmers often sell some of their birds before or during ND outbreaks. Birds that have come in contact with the ND particle can spread it to other birds in the market. So it is possible to buy birds that look healthy in the market, only to take them home where they will develop ND. People working in villages (e.g. farmers, vaccinators, traders, extension workers, etc.) may also spread the disease by carrying ND particles from households with sick birds to other households.

 Ask the participants to describe what they see in Figure 14 (Fig 10 of Flip Chart). It shows a woman thinking about how she might raise healthy chickens.

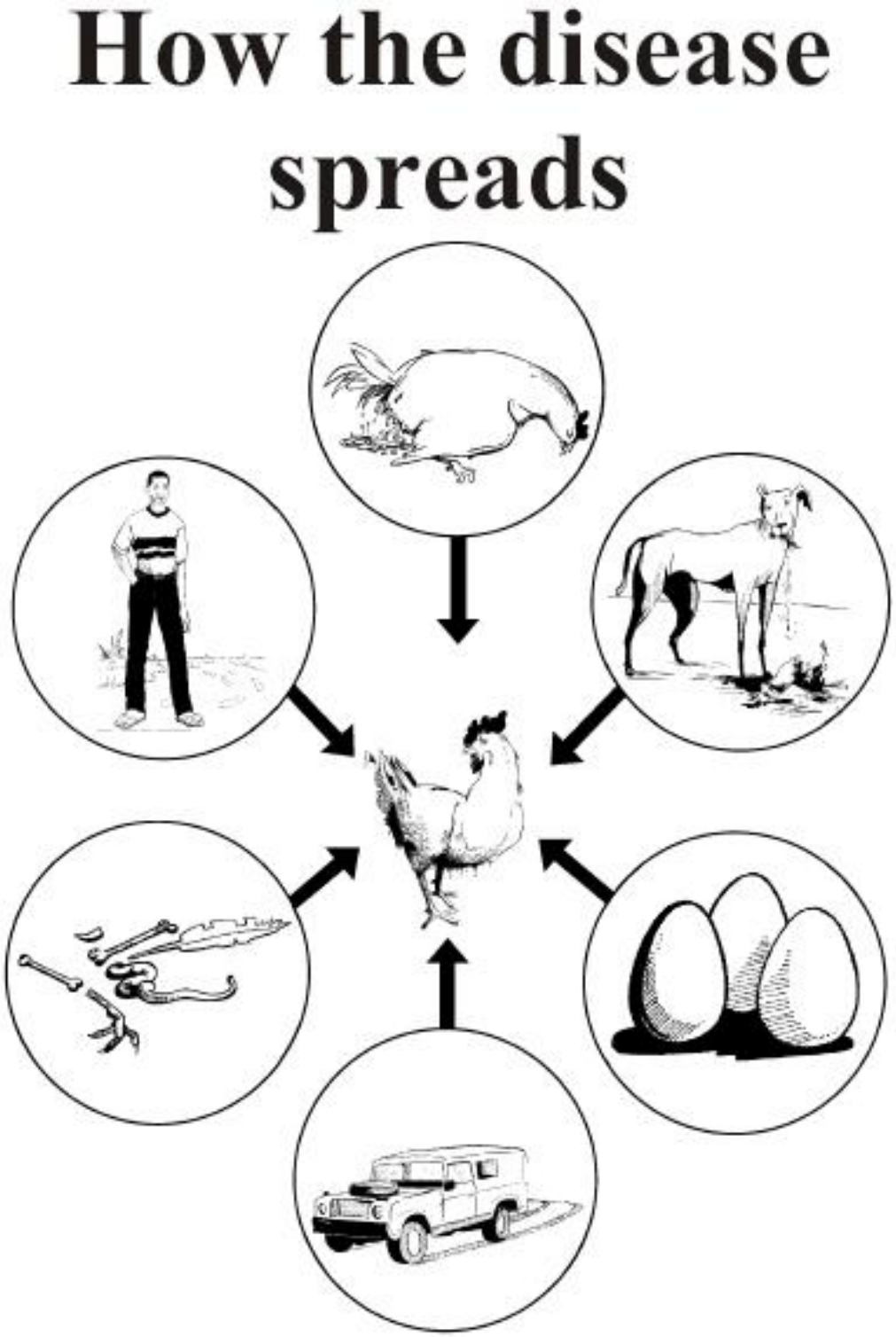


Figure 13: *The Newcastle disease virus can spread by many different ways.*

Figure 14: *Village chicken farmers are keen to know how they can keep their chickens healthy.*

3.2.4 Session 4 – Working with farmers and handling chickens. Using the vaccine dropper

Session objectives

1. To discuss how to talk and work with village chicken farmers, both male and female.
2. To learn how best to hold a chicken for vaccination.
3. To observe a healthy chicken.
4. To practise forming drops using a vaccine dropper.
5. To discuss any comments or questions that participants may have about any of the topics discussed during the day.
6. To present the homework to be done by participants overnight.

How to Work Successfully with Farmers

Many or all of the participants will be farmers. However, it is useful to outline the important aspects of the relationship between a service provider (the community vaccinator) and the client (the farmer).

The service provider must ensure that the clients have sufficient information to help them understand the importance and reliability of the service being provided. Farmers will be asked to pay for this vaccine and so they must be convinced that it is a worthwhile activity. It is the farmers who decide whether or not their chickens are to be vaccinated against ND. The job of the community vaccinator (and extension staff) is to provide appropriate information to farmers to help them to decide to vaccinate their chickens and then to provide the vaccination service.

Farmers are busy people and so the community vaccinator must plan activities to fit into the times that farmers indicate are the best for them. Remember that village chickens are often owned and managed by women. Vaccinators should have ways of ensuring that they are able to talk to the women who look after the chickens without causing problems with husbands. It may be best to have a general meeting first and ensure that the community is supportive of the program and understands the importance of working with female farmers. On your first visit to a house, try to make sure that as many family members are present as possible.

Always be on time. When you arrange a time to meet with farmers, do NOT keep them waiting. If you are late, apologise to those farmers who waited for you.

PRACTICAL SESSION
How to Hold a Chicken for Clinical Examination and Vaccination

NOTE: For this exercise it would be best to have a number of chickens available for the participants to practise holding the birds. However, if this is not possible, just conduct a discussion with the participants on the best ways to hold a chicken and then they can practise holding chickens the following day when they practise vaccinating birds.

Holding a chicken in a way that minimises the stress it experiences will help it respond better to the vaccination.

 What are the ways of holding chickens that make them distressed? Possible examples may be:

- Holding them upside down by the feet (ask participants how they would like to be held upside down?); and
- Holding them by the wing base – (how would we like to have someone hold us up by our arms?).

 What are the ways of holding chickens calmly and safely for examination and vaccination?

- Keep the chicken upright or horizontal.
- Hold the legs together with one hand and hold the wings down with the other hand or you can hold the bird against your body to keep one wing down.
- Use an assistant to hold the bird. You will need someone to help you examine a bird thoroughly and vaccinate it in a calm and safe manner.
- When vaccinating a bird, have your assistant hold the body of the bird (by holding the legs and the wings) on its side. You will then hold the head while applying the vaccine by eye drop. By holding the head yourself, you will be better able to coordinate the application of the drop into the bird's eye (Figure 15 – Fig 12 of Flip Chart).

Ask the participants to divide into pairs if there are sufficient birds. They should practise examining the bird to make sure that it is health and practise holding the bird as if they were going to vaccinate it.

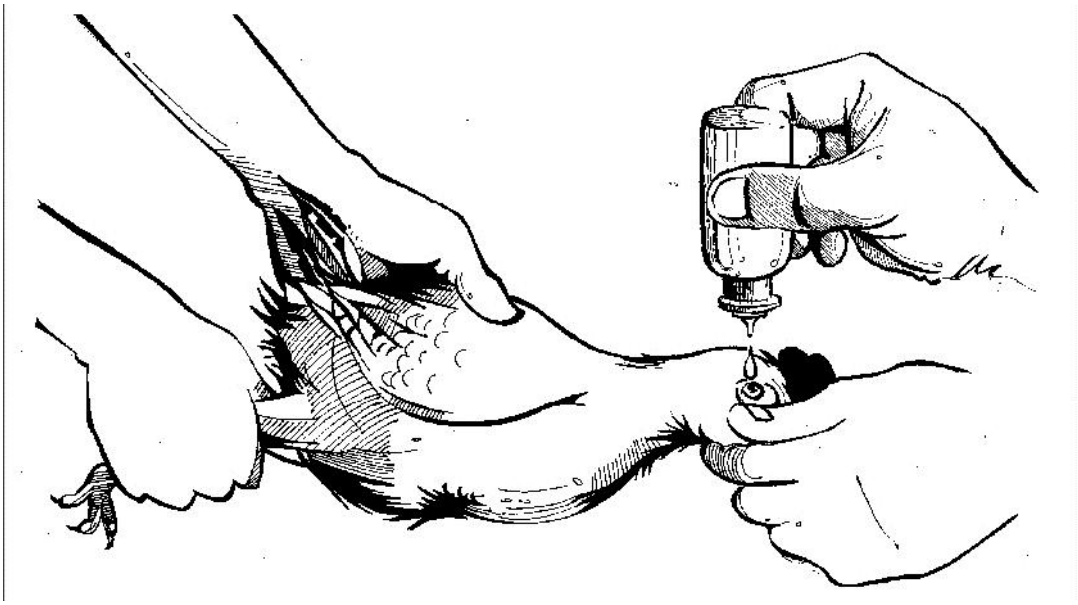


Figure 15: *Eye drop administration. When using an eye-dropper, hold it in a vertical position.*

PRACTICAL SESSION
Forming Drops Using the Vaccine Vial

Distribute eye-droppers to all participants. Rather than using I-2 vaccine, you may choose to work with droppers which have been filled with water for the purposes of this exercise. Ask participants to remove the lid from their droppers. Explain to them that when they receive vaccine droppers for actual vaccination campaigns, the lids of the droppers should be sealed to show that they have not been tampered with. Vaccinators should always check the droppers when they receive them to ensure that the lids are sealed and that the vaccine is also within the expiry date.

The droppers are made up of two basic parts: The base of the dropper holds the vaccine and the tip allows the vaccine to leave, drop by drop. Eye droppers produce drops of the same size when the droppers are held with the tip pointing straight down.

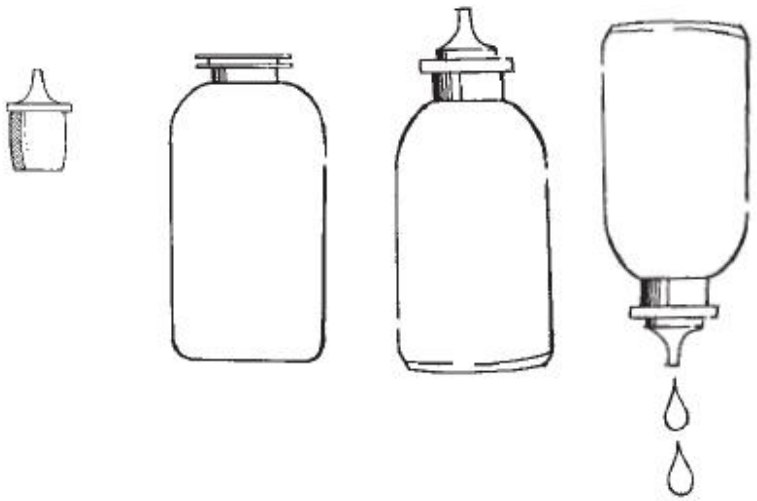


Figure 16: *A plastic eye-dropper consists of a part that holds the liquid and a tip that forms single drops.*

Participants should be aware that they must be careful with the tip of the dropper so as to ensure that the drops always come out in a uniform manner.

- Do not clean the tip of the dropper with anything hard that will cause damage; and
- Do not force anything into the tip of the dropper that will enlarge the opening.

Also, store the dropper away from direct sunlight and sources of heat, and rats and mice!

Show participants how to hold the dropper vertically and squeeze one drop out at a time. They should let a complete drop form and fall away from the dropper rather than touching the drop to a surface, as this will form incorrect drop sizes. Also encourage them to experiment holding the dropper at different angles, while noting the form and size of the drop that leaves the dropper. Participants should practise forming drops as much as they like until they feel confident of forming one drop at a time. Tomorrow morning they will practise vaccinating chickens with real vaccine (if it is available).

NOTE: Learning to use the eye-dropper is a very important part of the training. Vaccinators who are skilled at forming individual drops with their eye-droppers will waste less vaccine during the vaccination campaigns.

Discussion Session

The first day is coming to a close. Ask the participants if they have any comments or questions about any of the topics discussed during the day.

Homework

 Ask participants to prepare a presentation on the things they have learnt during the first day of training. Identify volunteers who are willing to present a summary of the first day's work at the start of the following day. Inform the group that each participant will be requested to make at least one presentation during the course.

Presentations may include –

- The characteristics of healthy and sick chickens;
- The signs of Newcastle disease (present using the relevant pages of the ND flip chart;
- How the ND virus causes disease;
- How to work with farmers;
- How to hold a chicken; and
- How to form drops using the vaccine dropper.

3.3 The Course Continues - Day 2

SUMMARY OF THE DAY'S TRAINING AND MATERIALS REQUIRED

Topics to be presented	Duration	Support material	Material for distribution
Session 5			
1. Revision of previous day's work	20 minutes	OHP or illustrated flip chart	None
2. Introduction to vaccines and how the chicken fights disease	20 minutes	OHP or illustrated flip chart	None
3. Controlling ND with vaccination	15 minutes	OHP or illustrated flip chart	None
Session 6			
1. The ND vaccine vial and its label	15 minutes	OHP or illustrated flip chart; I-2 vaccine eye dropper (if available)	I-2 vaccine eye dropper (if available)
2. Using eye-droppers (revision)	10 minutes	Eye-droppers	Eye-droppers
3. Storing and transporting I-2 vaccine	15 minutes	OHP or illustrated flip chart;	None
Session 7			
1. Cost of ND vaccination	25 minutes	OHP or illustrated flip chart and blank flip chart	None
2. Payment options	10 minutes	OHP or illustrated flip chart and blank flip chart	None
Session 8			
1. Control of an ND outbreak	15 minutes	OHP or illustrated flip chart	None
2. Housing and feeding of village chickens	10 minutes	OHP or illustrated flip chart	None
3. Presentation of extension package	20 minutes	Extension material, OHP	Extension material (e.g. ND control flip chart, calendar, etc.)
4. Discussion of the day's work	15 minutes	Blank flip chart	None
5. Homework	5 minutes	Blank flip chart	Basic instruction sheets on using the vaccine and organising a vaccination campaign

3.3.1 Session 5 – An Introduction to Vaccines

Session objectives
1. To revise the work done the day before (participants).
2. To introduce vaccines and how the chicken fights disease.
3. To learn about the control of ND using vaccines

Revision by Participants of Work Done the Day Before

Enquire if anyone has a question about the topics discussed the previous day.

Ask for volunteers to present a summary of the topics covered in sessions 2, 3 and 4 of the previous day with each volunteer covering a different topic. Encourage the volunteers to present the work as they would to farmers in their own village and ask the participants to ask questions or assist the volunteer where appropriate. These presentations should be fun so make sure that you put the volunteers at ease. These presentations help the trainer to learn whether the information presented in the sessions is being understood by participants. Such presentations may also help the trainer to gain a range of examples and stories that assist with the communication of particular topics.

An Introduction to Vaccines and How the Chicken Fights Disease

Vaccines protect animals and people from getting diseases. They are for preventing diseases, not for treating or curing them.

Ask the participants if they or their children have been vaccinated. What were the vaccines for?

Vaccines are different to drugs such as antibiotics that treat infections. A vaccine protects only against the particular disease that the vaccine is for. This means that the vaccine that we are using this week will prevent ND only and not other diseases.

NOTE: Ask participants to define the local word or phrase for "vaccine" and the local term for "drug" or "treatment." It is very important that the vaccinators and farmers have a clear understanding that a vaccine will prevent a particular disease, whereas a drug is used to cure an animal that is already sick.

When we talked about how ND is spread between birds, we mentioned that the disease is caused by a very small particle that we cannot see, called a virus. The vaccine that we are learning to use during this course is made of these same small particles but the particles in the vaccine are weak and not strong like the particles that cause the disease.

NOTE: The example given below to explain how a vaccine works should be understood in most areas and by people who have limited scientific knowledge about how disease occurs. If you think that the story below may not be well received in a certain area, then please prepare an alternative explanation before the training session.

Giving a vaccine to a bird is like training soldiers to defend an area. The chicken can be thought of as the land to be protected, the vaccine contains the soldiers and the ND particle (virus) is the enemy. The soldiers first have to practise how to fight and to learn about the enemy so that they can win the battle. When soldiers arrive in a new area that needs to be protected, they must establish their lines of defence and collect information about the enemy that is causing problems.

When we give the vaccine to the bird, the bird's defence system is trained to recognise the ND particle as the enemy and establishes lines of defence against it (Figure 17). It takes around 7 to 14 days for the chicken to develop these lines of defence. The next time that the bird encounters the strong virus, the defence lines are already in place and so the strong virus cannot take over the bird's body. The headquarters for the soldiers lies just behind the chicken's eye and so when the vaccine is given by eye-drop, most of it foes straight to this centre. This is the main reason why eye-drop administration causes such a strong protective response.

When soldiers stay in one place without seeing the enemy for a long time they may get lazy and think that the enemy is not going to attach. If the soldiers forget to maintain their lines of defence, then the enemy could attack and defeat the soldiers. It is the same with vaccine. If we do not re-vaccinate birds every 4 months (NOTE: some countries may prefer to vaccinate every 3 months), the birds' lines of defence against ND will get lazy and will be unable to fight the strong virus successfully.

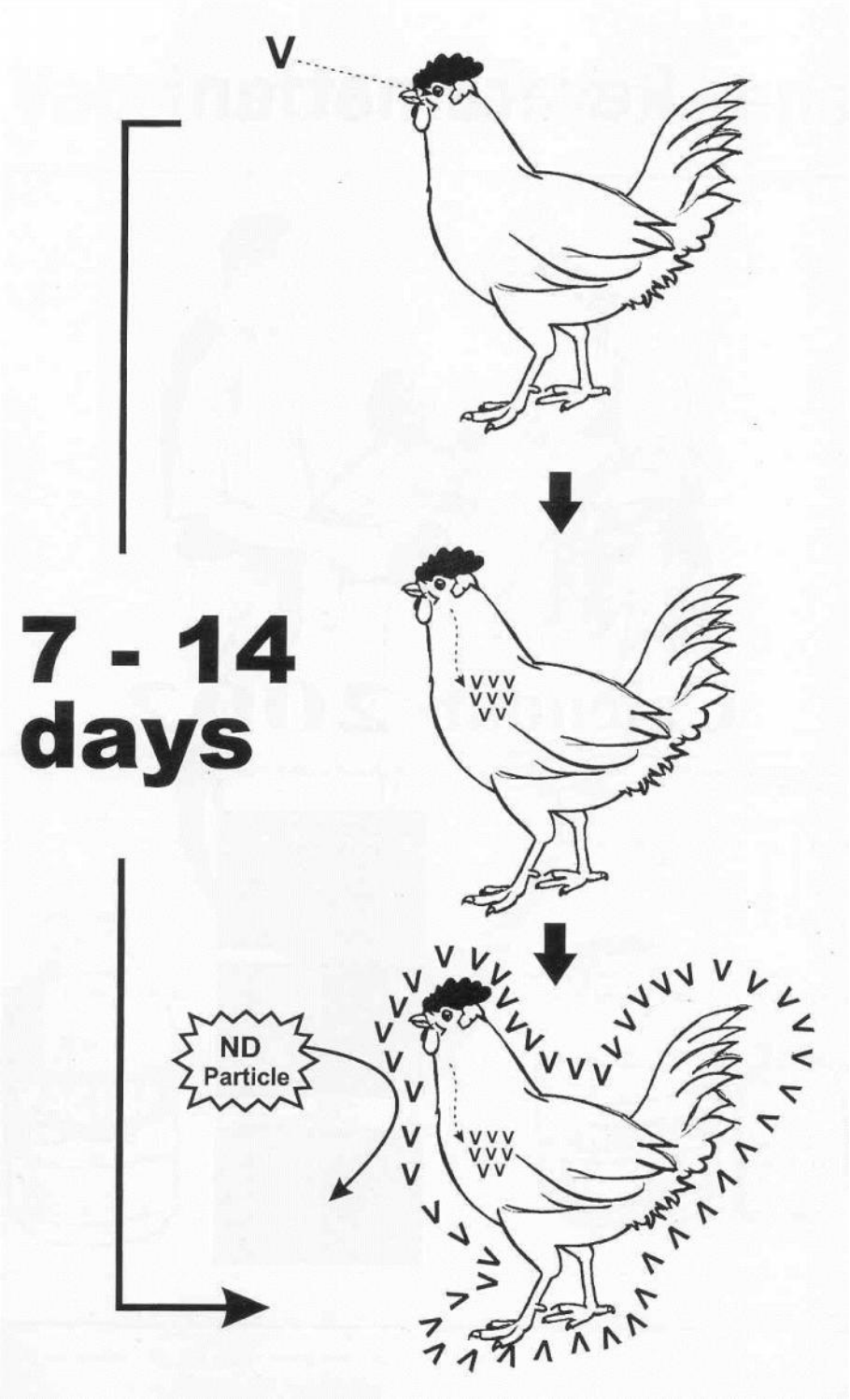


Figure 17: *After vaccination, it takes 7 to 14 days for a chicken to develop adequate protection against Newcastle disease.*

The calendar in Figure 18 (Fig 13 of Flip Chart) promotes the vaccination of chickens every 4 months. Because chicks are always hatching, it is usual to vaccinate regularly to ensure that the young birds are protected as well as refreshing the level of protection in older birds. Confirm that the participants understand the calendar:

- It highlights the need to estimate the number of birds to be vaccinated and order the vaccine in advance;
- It stresses the importance of making sure that the vaccine is available for purchase in the areas where farmers live; and
- It highlights the months of March, July and November as the months when vaccination campaigns should occur. You may wish to alter these months to better fit the agricultural calendar in the area where the training is being conducted.

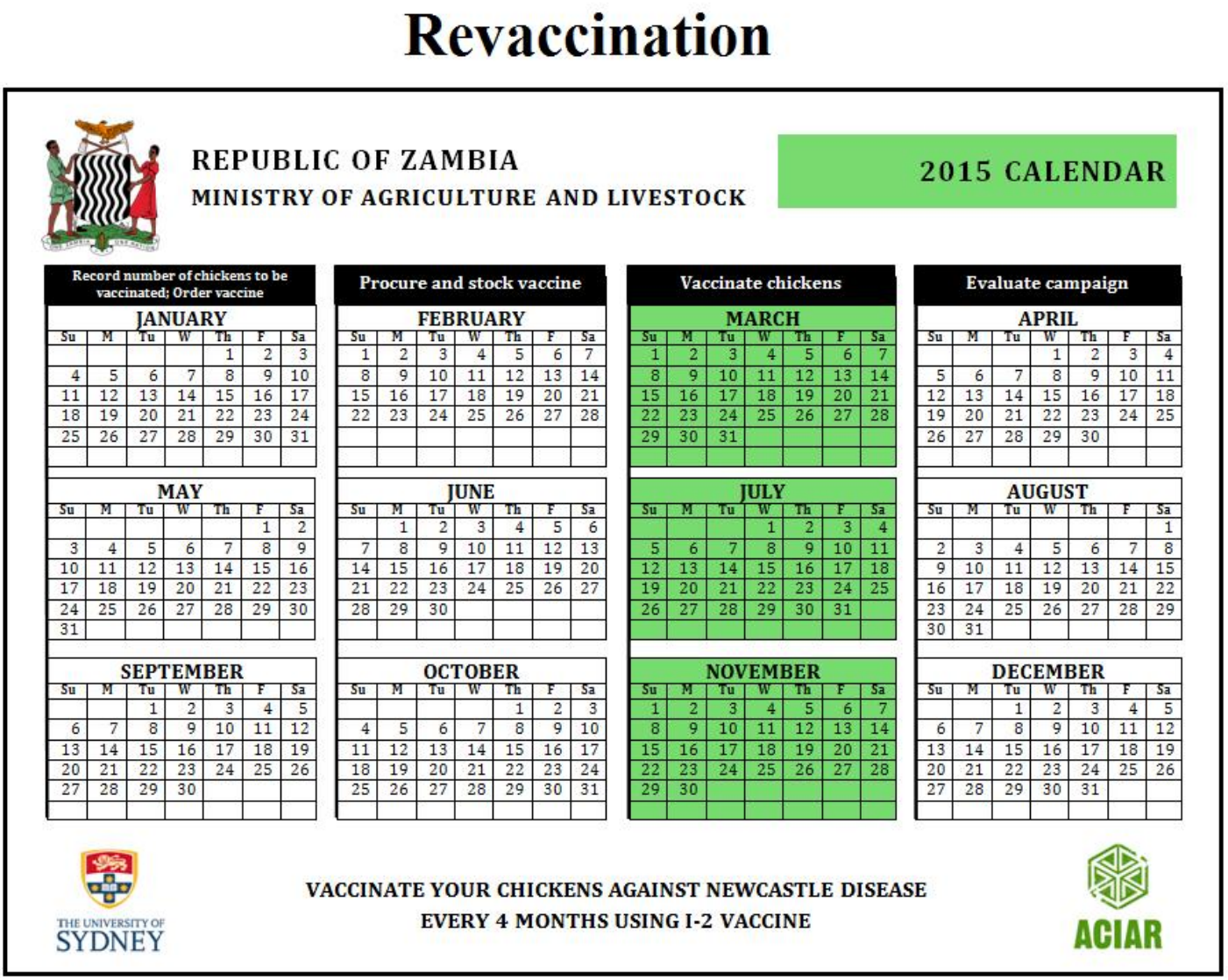


Figure 18: *For chickens to be constantly protected against Newcastle disease, they must be revaccinated.*

Figure 19: *Vaccination is the best way to control Newcastle disease in village chickens.*

Newcastle Disease Vaccines

ND occurs in many countries throughout the world. Over the years a number of different vaccines have been developed to prevent the disease. Some vaccines can be given by placing a drop in the eye of the bird, some via drinking water and some by injection. Most of these vaccines must be kept cold and will lose their effectiveness if left out of the refrigerator for more than a few hours.

When you get a dropper of vaccine, always check that it is the one that you have been trained to use. This training session deals with a vaccine called I-2 and it is especially designed to cope with situations where it is difficult to keep vaccines cold (Figure 19; Fig 11 of Flip Chart).

The I-2 vaccine in liquid form can remain active for 2 weeks after being taken out of the refrigerator if kept in a cool, dark place (i.e. temperatures from 22 – 29 °C). Once opened, the vaccine should be used as quickly as possible and preferably within two days.

It is recommended that you give the I-2 vaccine by eye drop as the bird makes a stronger defensive response when the vaccine enters through the eye.

We recommend that you give the I-2 vaccine by eye drop as the bird makes a stronger defensive response when the vaccine enters via the eye. You could give the vaccine via drinking water but it generates a smaller defensive response. You also have to give the vaccine more often if you use drinking water and this makes it more expensive. There is also the problem that the more aggressive birds may drink more water resulting in the weaker birds receiving an inadequate dose of vaccine.

Farmers who have tried both eye drop and drinking water prefer the eye drop method because:

- they know that the bird gets the vaccine,
- more birds survive an outbreak (8 out of 10 birds survive an outbreak when eye drop vaccination is used and only 6 out of 10 will survive after giving the vaccine via drinking water), and
- it is cheaper because birds are vaccinated 3 times a year and not the 5 times a year that is necessary with drinking water administration.

Interval

3.3.2 Session 6 – Vaccination Tools and their Use; Working with the I-2 ND Vaccine

Session objectives

1. To present a ND vaccine and identify the information contained on the vial label.
2. To revise the characteristics of an eye-dropper.
3. To learn how to hold an eye-dropper correctly.
4. To learn how to store and transport the ND vaccine.

The ND Vaccine Vial and its Label

The vaccine dropper and label are very important. The label contains important information that will help you with your work (Figure 20). Each vaccine label should tell you –

- Who made the vaccine;
- The name of the disease that the vaccine will prevent;
- The type (strain) of vaccine;
- How many doses are contained in each dropper;
- How the vaccine should be conserved;
- That the vaccine is for use in animals only and not humans;
- What batch number the dropper comes from;
- The date (month and year) after which the vaccine should no longer be used (expiry date); and
- Sometimes, how the vaccine should be administered.

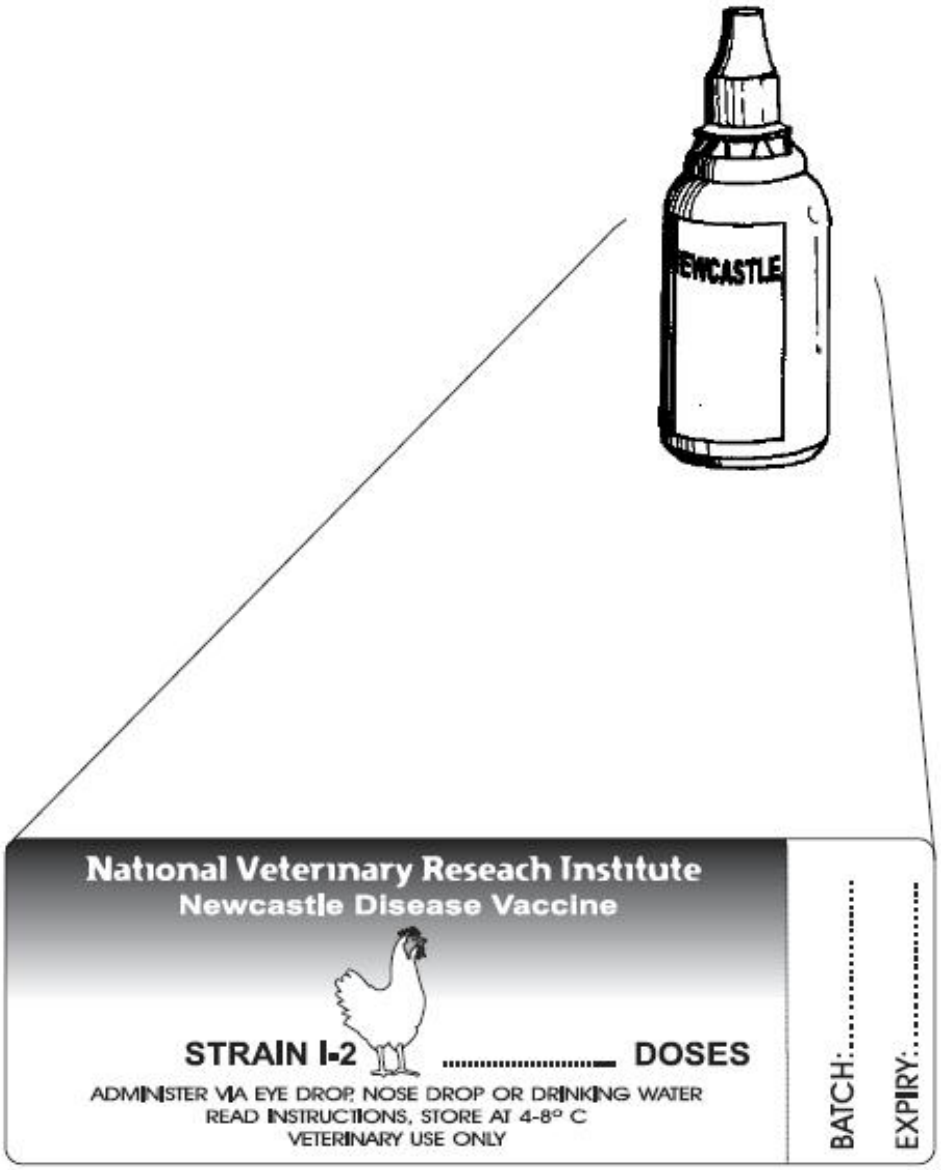


Figure 20: *The label on the vaccine dropper contains very important information.*

PRACTICAL SESSION

Distribute one viral of vaccine to each participant. Ask each participant to check that they can locate all of the information presented in the previous session on the label. Ask for a volunteer to assist with the revision of the characteristics of the eye dropper. Ask the volunteer to explain to the group the characteristics and function of each of the items. The group should assist the volunteer when necessary and ask questions if something is not clear.

How to hold an eye-dropper correctly

Remind participants once again that eye-droppers will produce drops of a uniform size only when held vertically (i.e. held straight with the tip of the eye-dropper pointing to the ground, Figure 16).

Encourage them to experiment holding the eye-dropper at different angles while noting the form and size of the drop that leaves the dropper.

Storing and Transporting the I-2 Vaccine

1. This vaccine can maintain its availability even if it stays outside the refrigerator for some weeks but you must not let it be exposed to sunlight or get hot!
2. The vaccine should not get very cold. So, do **NOT** freeze the vaccine. Do **NOT** put it into areas where ice forms.
3. If you can place the vaccine in a reliable refrigerator (2 – 8 ºC), the vaccine will last up to four months or until the expiry date on its label, whichever comes first.
4. Outside the refrigerator, the unopened vaccine will last for two weeks if stored in a cool (under 30 ºC), dark place. In villages, consider placing the vaccine dropper near the base of a clay water pot that is kept in a clean, dark place (Figure 22; Fig 14 of Flip Chart). The vaccine should also be stored in a way that prevents children from playing with it. If the vaccine is allowed to get hot (over 30 ºC), it will last for three days.
5. Once the dropper has been opened it will last for up to three days. General advice should be to keep the vaccine as cool as possible and use it as quickly as possible.
6. Always transport the vaccine in the field using a cool box and ice pack if they are available. If you do not have a cool box and frozen ice packs, wrap the dropper in a damp cloth and carry it in a covered open-weave basket (to keep it cool and away from sunlight; Figure 21).

Opened or Unopened dropper	Temperature	Storage time
Unopened	2 – 8 ºC (refrigerator)	4 months or expiry date (whichever is sooner)
	22 - 29 ºC	2 weeks
	30 - 37 ºC	2 days
Opened	10 - 29 ºC	3 days

Figure 21: *A covered, open-weave basket with a damp cloth inside is a good way to transport thermotolerant vaccine in the field.*

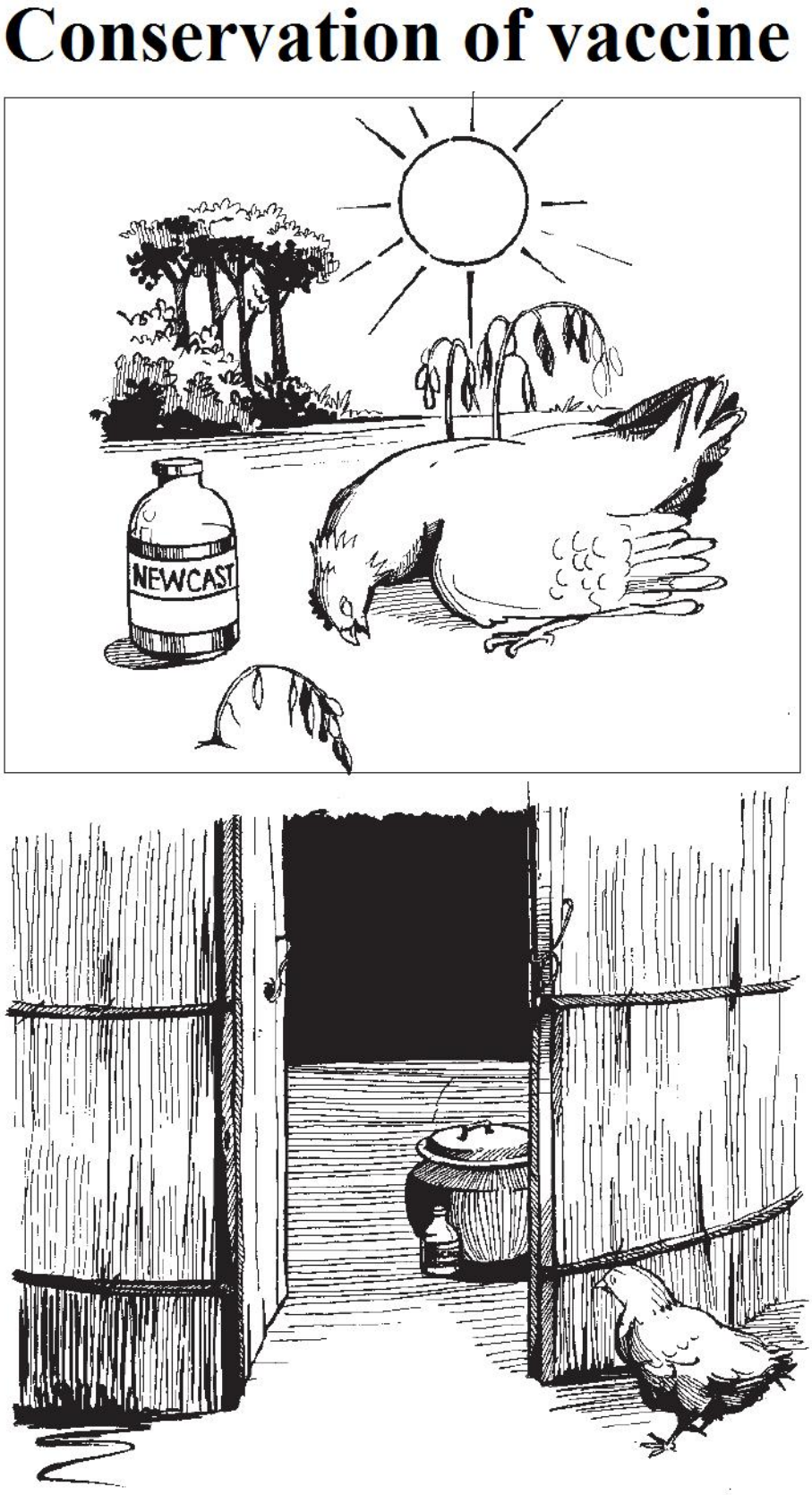


Figure 22: *Vaccine must be stored away from direct sunlight, in a cool, dark place.*

Interval

3.3.3 Session 7 – Selling your vaccination service

Session objectives

1. To discuss the costs involved in the purchase and use of ND vaccine.
2. To discuss ways of receiving payment for the vaccination of chickens.

Determining the Field Vaccination Price

The price of vaccinating a chicken against ND in the field is equal to the cost of:

- The production or importation of the vaccine;
- Its distribution (i.e. transport and storage costs); and
- Charges involved with administration of the vaccine.

It is useful for community vaccinators to have a basic understanding of the costs associated with an ND control program based on The price for vaccinating chickens using the I-2 vaccine has been set at 50 ngwee (ZMK 0.5)[1]. This is less than the price of a single egg. It covers the cost of producing and distributing the vaccine and allows the vaccinator to earn some money in return for the work he/she does.

It should be emphasised to the participants that the amount of money that the vaccinator will make from vaccinating other people's birds is not a lot. The main benefit to the vaccinator comes from vaccinating his/her own birds and then using the remaining doses in the dropper to vaccinate birds belonging to others nearby. The amount charged for administration per bird should cover all additional expenses so that the vaccinator can buy more vaccine for the next campaign and any other materials such as transport containers.

The vaccinators will pay ZMK 30 for a dropper of I-2 vaccine containing 300 doses. This will cover the cost of producing and distributing the vaccine. Vaccinators should be reminded of this price well in advance of receiving the vaccine, so that they can save money to buy the dropper.

To recover this cost of a 300 dose dropper, the vaccinator would need to vaccinate 60 chickens at 50 ngwee (ZMK 0.5) per vaccination. The table below gives an example of the money that a vaccinator could earn according to the number of birds vaccinated.

Number of birds vaccinated	Total money received at 50 ngwee per bird	Minus the cost of the vaccine dropper	Total money earned by the vaccinator (ZMK)
50	25	-30	-5
100	50	-30	20
150	75	-30	45
200	100	-30	70
300	150	-30	120

[1] Calculate the above table using the price that has been established by the local authorities.

The more birds that are vaccinated per dropper of vaccine, the greater the return on the ZMK 30 investment. To achieve this, vaccinators must organise their campaigns in an efficient manner and strive to perform their work in the best way possible so that farmers will want to keep vaccinating their chickens.

They should understand the importance of reliability of the service being provided. If farmers are expected to pay for the vaccine they must be convinced that it is a worthwhile activity. It is the farmers who decide whether or not their chickens are to be vaccinated against ND. The job of the community vaccinator (and extension staff) is to provide appropriate information to farmers to help them to decide to vaccinate their chickens and then to provide a good vaccination service.

Method of Payment

 There are many different ways of receiving payment for vaccination. Discuss and list the various options suggested by participants that may be acceptable in the area where the vaccinators will be working.

NOTE: Some payment possibilities may be:

Farmers to pay in cash on the day of vaccination. With this option, the vaccinators will need to arrange some coins to facilitate the giving of change to farmers or they will need to record the change owing to farmers. The change owing may be written down as credit for the farmers so that the amount is deducted from the amount to be paid during the next vaccination campaign.

Farmers to pay in-kind. Instead of paying cash, farmers may provide the vaccinator with a chicken or some eggs or some other product. The monetary value of the product should be determined so that all agree that the exchange is fair. If the value of the product is greater than the amount owing for the vaccination, it can be recorded as a credit to the farmer so that he or she pays less during the next vaccination campaign.

Farmers to pay a deposit. In some areas it may be possible to encourage farmers to provide an indication of their willingness to participate in ND vaccination campaigns throughout the year by paying a deposit to the vaccinator at the start of each year. The amount paid to the vaccinator should be recorded and the amount of the deposit remaining would be calculated after each vaccination campaign. This would decrease the need to provide change on the day of vaccination and would also help the vaccinators plan ahead because they would know which farmers wanted to have their birds vaccinated in advance.

Vouchers. Vouchers can be used to encourage the participation of poor farmers in certain circumstances. Farmers who participate in a group meeting on ND vaccination are given a voucher by the organising agency. The voucher is given to the community vaccinator by the farmer after vaccinating the farmer's birds. The vaccinator gets paid on presentation of the voucher to the organising agency.

Interval

3.3.4 Session 8 – Extension Materials for ND Control and Other Disease Control Measures

Session objectives

1. To discuss the ways to control an outbreak of ND.
2. To present general advice concerning village chicken production such as the provision of good housing and supplementary feed.
3. To demonstrate the range of extension material available to assist vaccinators.
4. To discuss any comments of questions that participants may have about any of the topics discussed during the day.
5. To present the homework to be done by participants overnight.

General Husbandry Advice

What to do during and after an outbreak of ND?

In addition to administering ND vaccine to control ND, we can use some general disease control practices to reduce the spread of the disease. It is best not to buy chickens from the markets or neighbouring villages at the times of the year when ND outbreaks are more common (Figure 23; Fig 15 of Flip Chart). When introducing new birds, it is always advisable to quarantine the new birds for at least 14 days to ensure that they are healthy and not carrying a disease. During the 14 days, the new birds can be held in a cage with easy access to food and water.

When chickens show signs of illness, they should be separated from other healthy birds (Figure 24; Fig 16 of Flip Chart). Remind participants that children, sick people and the elderly should not have contact with sick birds. Emphasise once again that once chickens become sick, they should not be vaccinated.


Ask the participants if many village chicken farmers in their areas will have two chicken houses? If they do not, ask the participants to come up with other ways of separating sick chickens. They may suggest that the sick chicken (s) be placed in a chicken cage, or have their legs tied or on a tether. Always ensure that the sick chickens have water and food available nearby should they need to drink or eat.


When a chicken dies from ND, ask the participants what they normally do? Advise them that when a chicken is very sick, it is best to slaughter it. Do not carry the chicken into another area that is free of the disease. The slaughtered bird should be burned or buried (Figure 25; Fig 17 of Flip Chart).

NOTE: Do not recommend that farmers eat sick (or dead) birds, but remember that in some areas, where families have limited access to meat for home consumption, it can be difficult for them to accept this recommendation. In these cases, it is important that the families know how to reduce the spread of disease by the parts of the bird that were not used. Remind people that if the sick or dead birds have Avian Influenza, then the people handling these birds could also become very sick or even die.

NOTE: If chickens that have been vaccinated against ND start to suffer high mortalities, then it is important to be very careful as they may be infected with Avian Influenza. The control of ND facilitates the rapid detection of Avian Influenza. Poultry farmers should isolate sick chickens, bury dead chickens, wash their hands with soap and send an urgent message to the local veterinary assistant.

After birds have died from ND, farmers should wait 30 days after the last bird died before introducing new birds. The Newcastle disease virus should be destroyed after 30 days. You can assist this process by ensuring that all droppings from sick birds are removed and chicken houses cleaned thoroughly. The disease particle (virus) can survive for several months inside clumps of bird droppings.

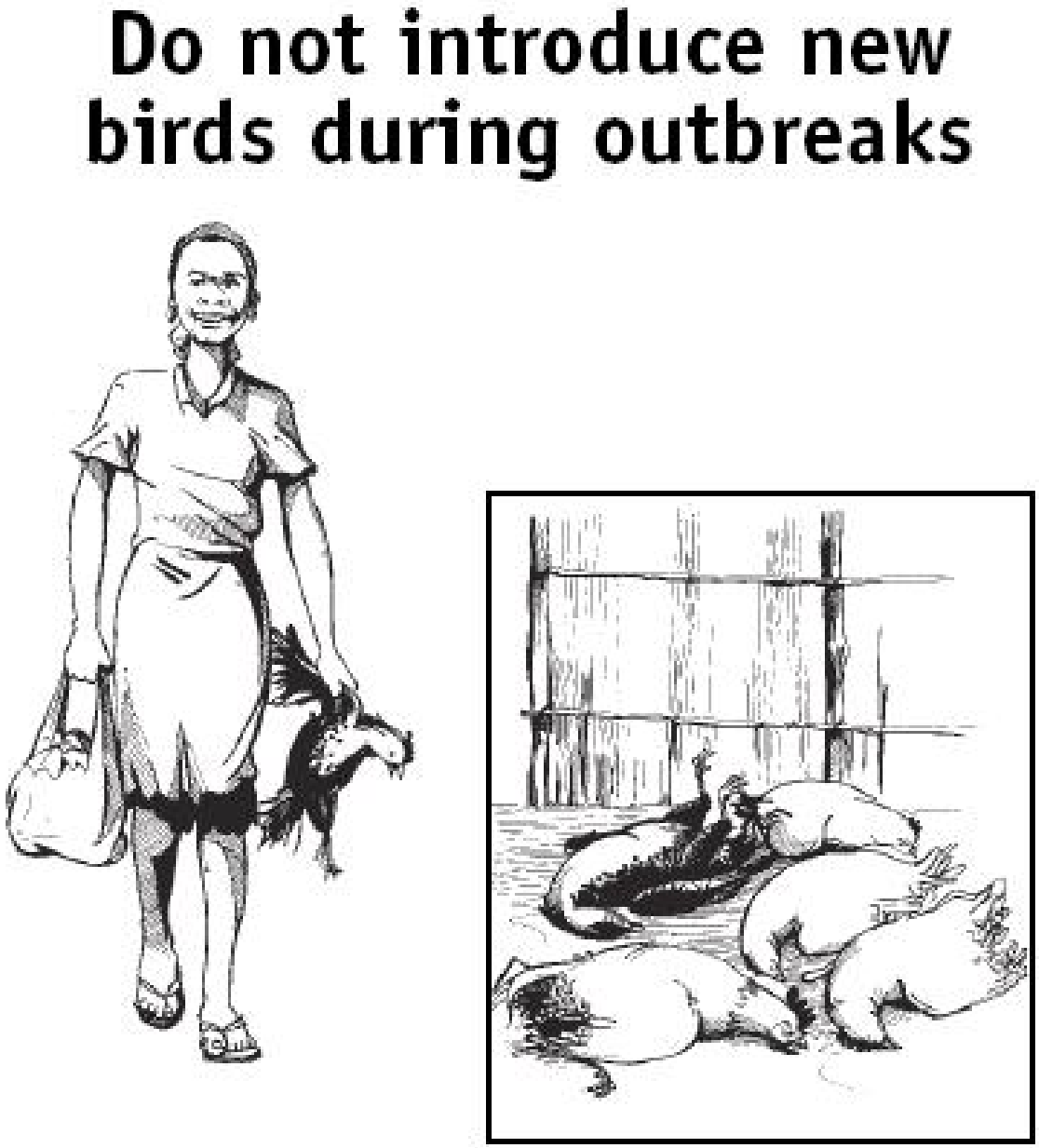


Figure 23: *Do not bring new birds to farms during outbreaks of Newcastle disease.*

Figure 24: *Sick chickens should be separated from healthy chickens.*

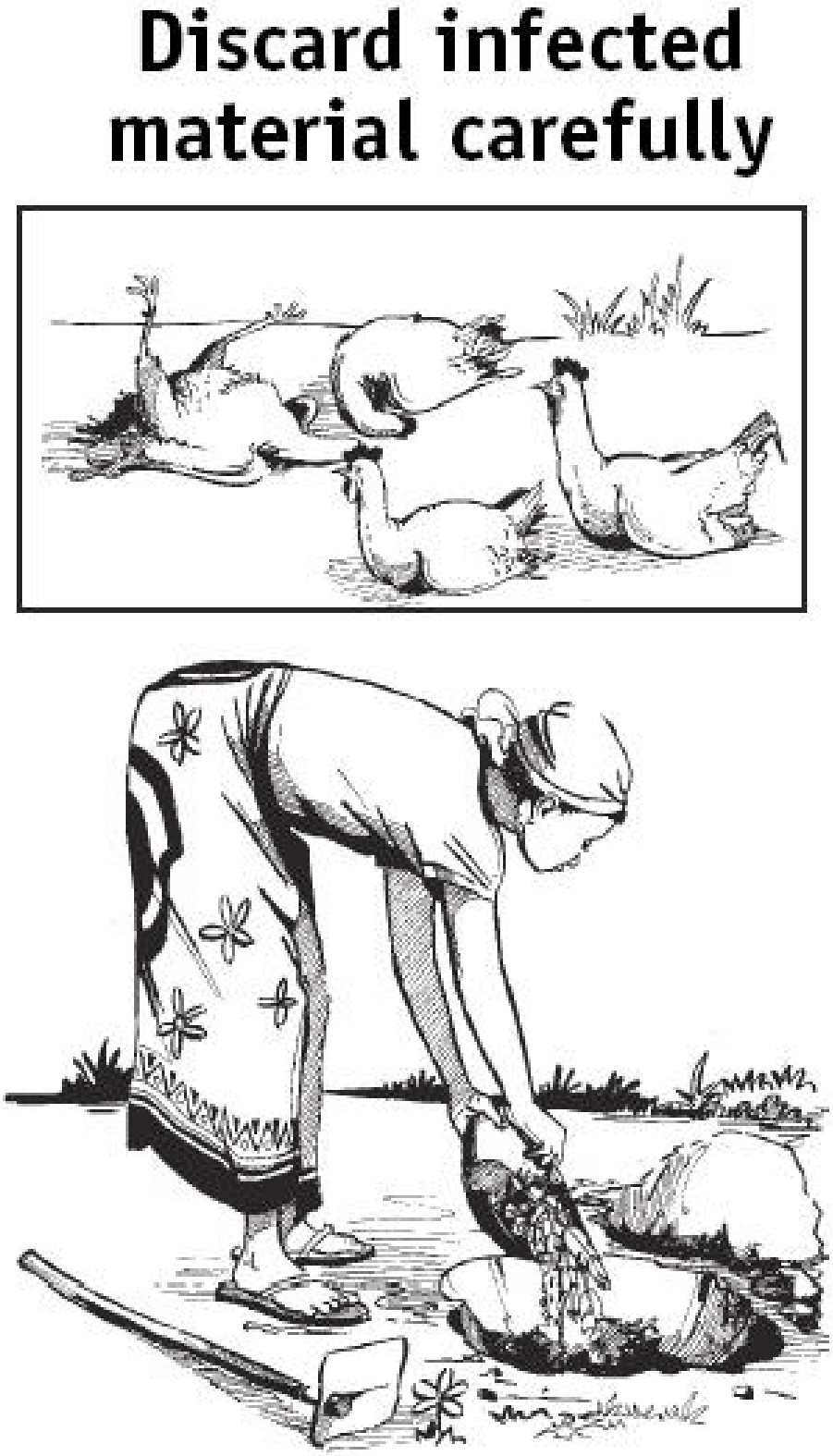


Figure 25: *Dead birds must be disposed of carefully to stop the disease spreading to new areas. The hole should be at least one metre deep so that dogs and other predators cannot dig up the carcass.*

The Importance of Good Housing for Chickens

Providing good housing for chickens can reduce the risk that diseases, including ND, will spread from bird to bird. On the top of Figure 26 (Fig 18 of Flip Chart), a small chicken house built on the ground is shown. This type of housing is used for hens with young chicks. The door to the house is big enough so that the floor can be regularly cleaned (on a daily or at least a weekly basis). The house is built from local materials and should be burnt and rebuilt whenever a number of birds have been sick or external parasites appear.

The elevated chicken house shown on the bottom is suitable for adult birds. The floor slats allow manure to fall through and so prevent birds from coming in contact with it. The house should have good ventilation and inverted metal cones on the legs that will prevent the entry of predators such as rats, snakes, etc.

Always remove the bark from timber used to construct the houses so that external parasites such as ticks and mites will have nowhere to hide. Place ash on the floor and walls of the houses after cleaning as this will also discourage external parasites.

The Importance of Good Nutrition (especially for chicks)

The health of chickens can be improved if they feed well. This means that birds need adequate quantities of good quality feed. This is very important for young chicks that sometimes have to walk a long way to find something to eat. By placing small pieces of food, such as leftover food, maize meal, worms, green leaves, ants and termites under a cover (creep feeder) that only the chicks can enter, they can have a good meal without the hen eating too much (Figure 27; Fig 19 of Flip Chart). This reduces the amount of food that needs to be provided by poor families.

Always make sure that the chickens have access to water. When possible, offer the birds clean fresh water.

Healthy well-fed birds will also respond better to vaccination.

The last image in the flip chart (Figure 28; Fig 20 of Flip Chart) is to remind farmers and community vaccinators that they should always consult the veterinary or extension services when they have a question about raising village chickens.

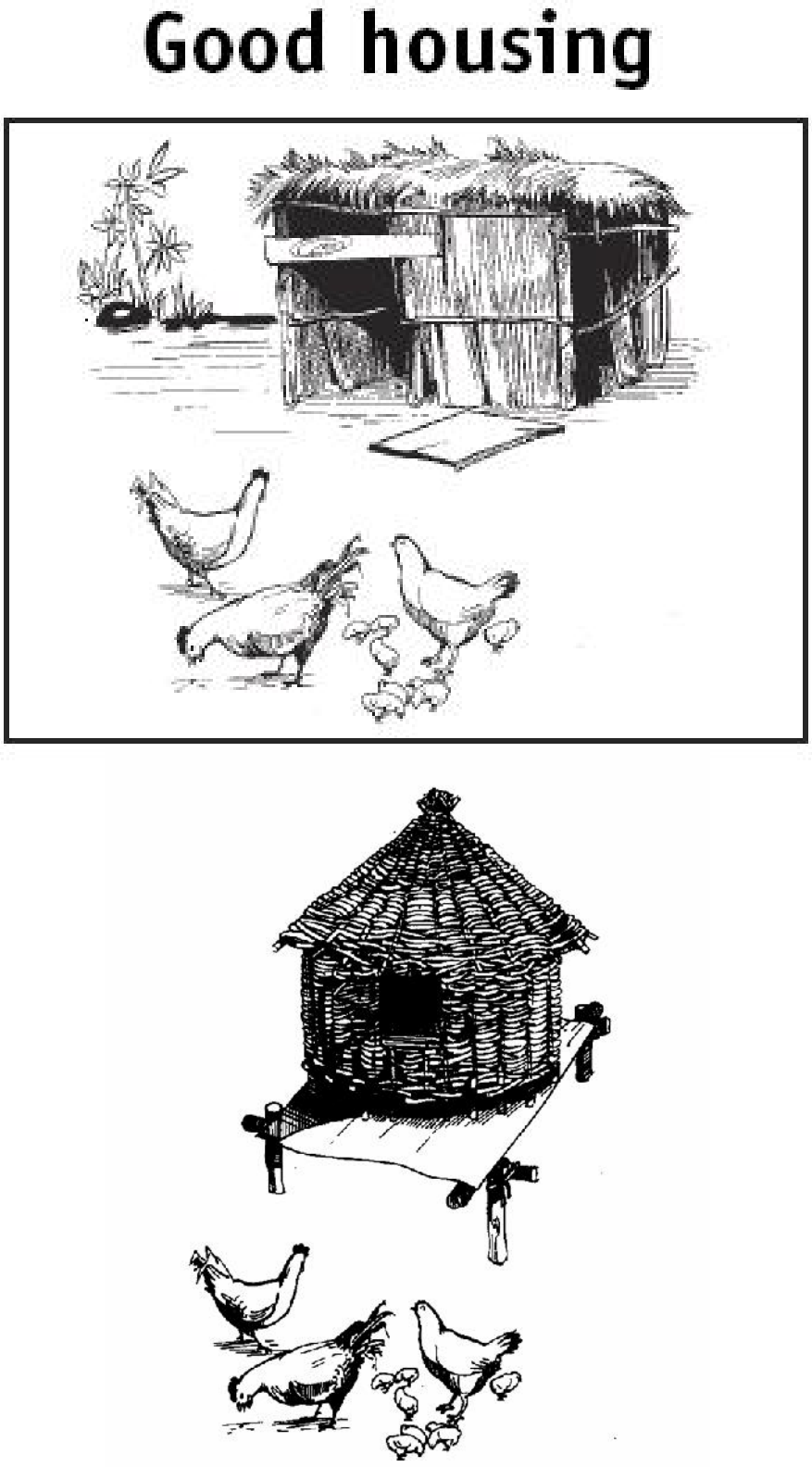


Figure 26: *Appropriate housing for young and adult birds can reduce the risk that disease will spread from bird to bird, and also protect birds from predation.*

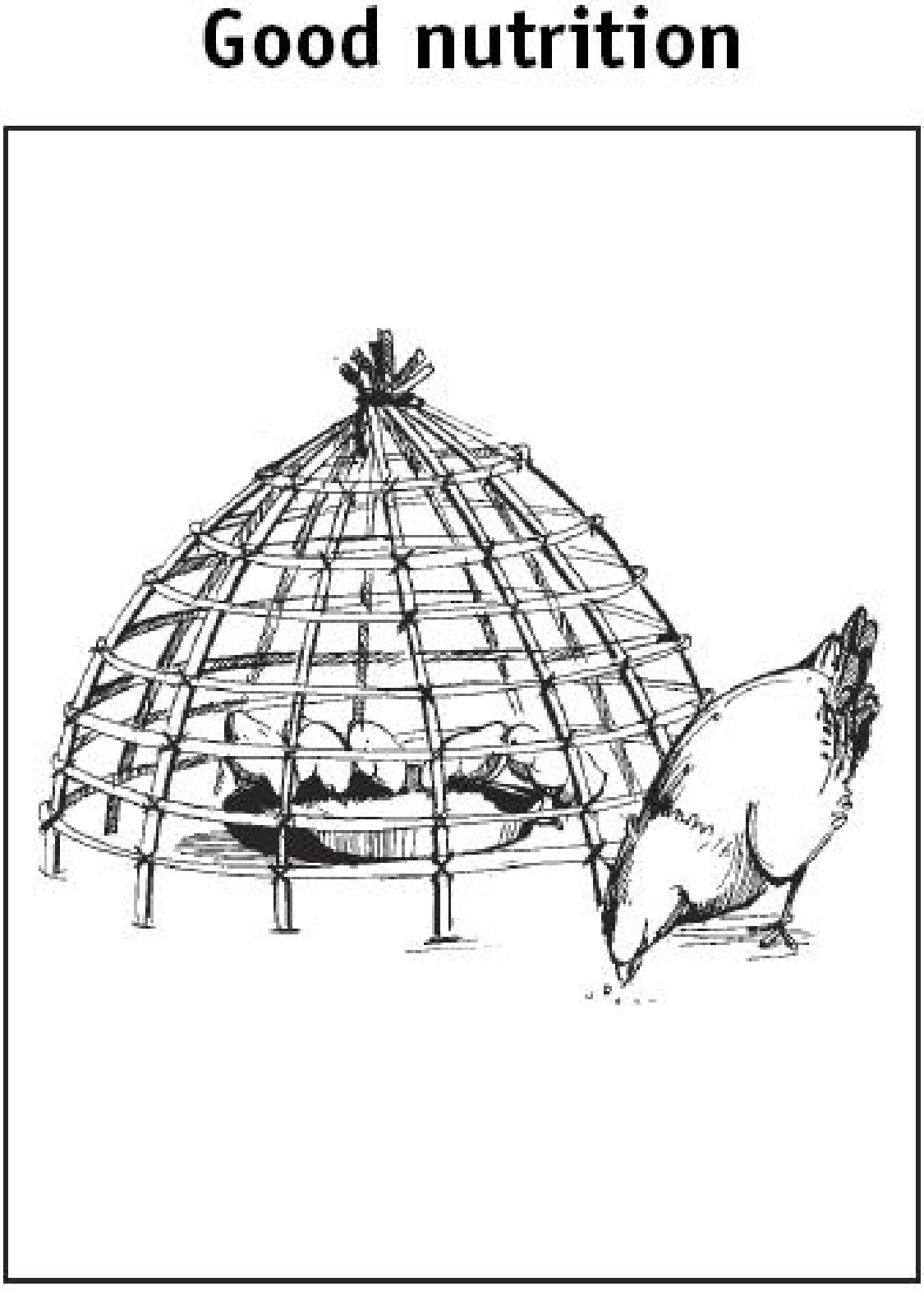


Figure 27: *A creep feeder for chicks.*

Figure 28: *It is important for farmers to know from whom they can obtain more information.*

Presentation of Extension Material

Distribute copies of the available extension materials to all participants.

Vaccination campaigns against ND will be more successful if farmers understand that a ND vaccine exists and that it WILL protect most birds that have been vaccinated with it. In many areas, the idea of vaccinating chickens will be very new and farmers may be reluctant to believe that such technology exists. It is very important that vaccinators and extension workers take time to inform farmers about ND and how it can be controlled well in before of vaccination campaigns begin.

To help vaccinators and extension workers raise the awareness of farmers, a range of extension materials about the control of ND has been developed. Some of the material is for use by the vaccinators themselves, while other material can be used to prepare newspaper articles and/or radio programs, etc. If information about controlling ND reaches farmers from a range of sources (e.g. radio, newspapers), they will be more likely to accept the information provided in their local area by the vaccinator or the extension worker.

Material available includes:

A flip chart - an illustrated A3 booklet, with clear, largely self-explanatory line drawings and an accompanying narrative. It can be used for training and in the field, with farmers, to explain the characteristics of the vaccine and its application. (Please contact CVL for availability.)

A poster – includes a close-up photo of a chicken being vaccinated. The poster provides space for the local vaccinator to write the venue, date, time and contact person for the next ND vaccination campaign. (Please contact CVL for availability.)

A pamphlet – prepared to provide an introduction to ND and its control. It is printed on both sides of an A4 sheet and is easily reproduced. It is useful for front line extension staff, literate farmers, farmers' associations and school children. (Please contact CVL for availability.)

Extension messages – A list of questions and answers commonly asked by farmers and vaccinators is included in the Manual for Extension Workers.

A vaccination calendar – this calendar highlights the months in which vaccination campaigns should be implemented, prompts vaccinators to get their orders for vaccine in well before the campaign begins and reminds distributors when they should have the vaccine in stock. More details concerning how to determine ND outbreak patterns may be found in 'Controlling Newcastle disease in village chickens: a field manual' (Alders and Spradbrow 2001). (Please contact CVL for availability.)

A guide to organising a vaccination campaign – This guide covers the basic steps a vaccinator needs to do to plan and implement a vaccination campaign and is included in the Manual for Extension Workers, as well as in a leaflet. (Please contact CVL for availability.)

I-2 Vaccine Instructions – This details all of the important information about the vaccine, its use and storage and is included in the Manual for Extension Workers, as well as in a leaflet. (Please contact CVL for availability.)

Discussion session

The second day is coming to a close. Ask the participants if they have any comments or questions about any of the topics discussed during the first two days.

Homework

 Ask participants to read the information contained in the sheets dealing with the use of the I-2 vaccine (Appendix 5) and the organisation of vaccination campaigns (Appendix 6) as well as the extension material that was just distributed to them. This information will be discussed the following day in more detail and participants will design a vaccination campaign to be used in their own areas.

 Tomorrow participants will practise vaccinating chickens. At the same time, they will compare different ways of transporting the vaccine to the vaccination site. Ask participants to bring along the containers in which they would like to carry the vaccine. Also make sure that the farmers who have agreed to allow the vaccinators to practise vaccinating their birds are reminded not to let their birds out before the group arrives.

 You may wish to set some questions for them to work on overnight, particularly if you are concerned that some participants are not keeping up with the course. Review the answers to the questions the next morning. For example:

Questions	Section in this manual where answers can be found
What are the signs of a healthy chicken?	Section 3.2.3
What are the signs of a sick chicken?	Section 3.2.3
What is an eye-dropper and what do you use it for?	Section 3.2.4
How should you store and transport the vaccine?	Section 3.3.3
How will you tell farmers about the ND vaccine and the vaccination campaign?	Section 3.4.2
Should you vaccinate a sick chicken?	Section 3.2.3
What type of chicken housing would you recommend?	Section 3.3.4
What type of additional feed would you recommend for village chickens?	Section 3.3.4
What would you do once a ND outbreak has started on your farm?	Section 3.3.4
What is the price to vaccinate one chicken?	Section 3.3.3

3.4 Bringing it All Together - Day 3

SUMMARY OF THE DAY'S TRAINING AND MATERIALS REQUIRED

Topics to be presented	Duration	Support material	Material for distribution
Session 9			
1. Revision of the previous day's work	20 minutes	OHP or illustrated flip chart	None
2. Compare containers for transporting vaccine	10 minutes	Various vaccine transport containers, cotton cloth, 0 – 50 ºC thermometers	None
3. Speaking with farmers	5 minutes	OHP or illustrated flip chart	None
4. Practise examining chickens	10 minutes	Chickens	None
5. Practise vaccinating chickens	15 minutes	Vaccine; chickens	None
Session 10			
1. Record keeping	20 minutes	OHP or illustrated flip chart; exercise books	One vaccination registration sheet to each participant
2. Price list preparation	10 minutes	OHP or illustrated flip chart; or blank flip chart and felt pens	None
3. Planning a vaccination campaign	45 minutes	Blank flip chart and felt pens	None
4. Prepare role plays	5 minutes	None	None
Session 11			
1. Present role plays	30 minutes	None	None
3. Self-monitoring by vaccinators	20 minutes	Blank flip chart and felt pens	None
4. Monitoring and evaluation at the end of each campaign	30 minutes	Blank flip chart and felt pens	None
Session 12			
1. Prepare annual work plan	30 minutes	Blank flip chart and felt pens	None
2. Recommendations by facilitator	5 minutes	Blank flip chart and felt pens	None
3. Evaluation of course by participants	15 minutes	OHP or illustrated flip chart; or blank flip chart and felt pens	None.
4. Discussion of all aspects of course	15 minutes	None	None
5. Presentation of certificates	5 minutes	None	Certificates of participation
6. Closing ceremony	10 minutes	Material needed will depend on the seniority of the person performing the closing ceremony	None

3.4.1 Session 9 – Vaccinating chickens and comparing vaccine transport containers

Session objectives

1. Participants to revise work done the day before.
2. To compare the temperatures inside containers brought by participants to transport the vaccine in the field.
3. To practise speaking with village chicken farmers about ND control.
4. To practise vaccinating chickens.

Revision by Participants of Work Done the Day Before

Enquire if anyone has a question about the topics discussed the previous day.

Ask for four volunteers to present a summary of the topics covered in sessions 5, 6, 7 and 8 of the previous day with each volunteer covering a different session. Discuss each presentation to clarify and stress important points.

PRACTICAL SESSION

During this session, we will practise speaking with village chicken owners, vaccinating chickens and compare the effectiveness of the vaccine transport containers presented by participants.

Comparing Vaccine Transport Containers

The number of containers to be compared will depend on the number of thermometers that you have. For instance, if you have three 0 to 50 ºC thermometers, ask participants to choose the three containers that they would like to test. Provide each of the owners of the containers with a dropper of vaccine and ask them to wrap the vaccine dropper together with the thermometer in a damp cloth and place them in the containers. If it takes you about 20 to 30 minutes to reach the vaccination site, then you can check the temperature on arrival. Otherwise, you can leave the containers in the sun near to your classroom and check the temperature in each container on your return from vaccinating the birds.

The best container is one that protects the vaccine dropper from sunlight and keeps the vaccine as cool as possible (Figure 22).

Table 3 below demonstrates the result of an experiment conducted in Gurué District in Zambézia Province of Mozambique. The suitability of three potential vaccine transport containers was compared. The containers tested were an open weave grass basket with a lid, a cotton carry bag and a small backpack made from synthetic material. A dropper of vaccine and a thermometer wrapped together inside a damp cotton cloth were placed inside each container. The containers were then placed in the sun and the internal temperatures read at hourly intervals.

TABLE 3: A COMPARISON OF INTERNAL TEMPERATURES IN THREE VACCINE TRANSPORT CONTAINERS OVER THREE HOURS.

Time	Grass basket	Cotton bag	Backpack
0 hours	25 ºC	25 ºC	25 ºC
1 hour	23 ºC	28 ºC	31 ºC
2 hours	23 ºC	28 ºC	35 ºC
3 hours	24 ºC	29 ºC	39 ºC

Figure 29: *Thermometers can be used to check internal temperatures of possible vaccine transport containers to assist with selection in areas where cool boxes and ice packs are not an option. Covered open-weave baskets (A) with the vaccine wrapped in a damp cloth inside usually provide the coolest environment. Closed synthetic backpacks (B) and plastic bags (C) are not suitable. The temperatures shown were recorded after carrying the containers in the field for 20 minutes on a sunny 35 ºC day (Alders and Spradbrow 2001).*

Speaking with Farmers

Always be polite.

On the day of the vaccination, the following points should be covered with each farmer:

- Ask the farmer if all of his/her birds are in good health;
- Ask the farmer to help hold the birds for vaccination if necessary and show him/her how to hold the bird with the head to one side so that you can easily administer the eye drop;
- Check that the farmer understands that the vaccine will protect against ND only;
- Mention that birds in poor condition or infested by parasites may not respond well to the vaccine;
- Remind the farmer that birds should be revaccinated every 4 months;
- Let the farmer know that you will pass by again after the vaccination to check that everything is going well and to plan for the next campaign;
- Birds may be eaten immediately after vaccination if necessary;
- Ask the farmer if he/she has any questions; and
- Record the farmer's name, the number of birds raised, the number vaccinated and payment made.

PRACTICAL SESSION

Clinical Examination of a Chicken and Vaccinating a Chicken

If possible, organise for the participants to visit another farmer(s) to practise holding and vaccinating chickens a second time. Otherwise, reuse the chickens that were vaccinated on the previous day. It is important that the participants get as much practice as possible in holding and vaccinating chickens, so that they can feel confident to do it by themselves during the vaccination campaign.

NOTE: If live vaccine is available, this session is best done at a farmer's home, so that participants can practise under more realistic conditions. The trainer should ensure that the farmer is fully informed about what the participants are doing and the farmer should be thanked at the end of the session. If it is not possible to visit a farmer's home, or if live vaccine is not available, organise to have chickens ready at the training course.

Examining Chickens

If this session is being conducted at a farmer's home, remind the participants that they should be polite to the farmer and that the farmer should be aware of what we will be doing before we start vaccinating the chickens. At the end of the session, the family should be thanked for their cooperation.

Before vaccinating each chicken, check to see that it is reasonably healthy. Sick chickens should not be vaccinated as they will have a weaker immune response to the vaccine and so may still catch ND during an outbreak. Also, if they die soon after being vaccinated, the farmer may blame the vaccine. The farmer should therefore be shown any sick chickens and advised to keep them separate from the rest of the flock.

Check the chicken for the signs of a sick chicken that were mentioned in section 3, such as a drooping head; closed eyes; fluffed feathers; dirty vent (posterior); not moving; legs bent; or not crowing (singing).

Vaccinating chickens

After examining the birds each pair of participants should practise vaccinating a bird.

- Vaccinate birds away from direct sunlight (e.g. in the shade of a tree);
- One person should hold the chicken while the other vaccinates;
- Hold the dropper vertically above the chicken's eye;
- Place one drop in the eye of the chicken (do not let the tip of the dropper touch the bird's eye); and
- All healthy birds in a flock should be vaccinated (even newly hatched chicks).

Wash your hands after handling the chickens. The participants should also be asked to do this after visiting each flock of birds that they vaccinate during a campaign so as to minimise the chance of spreading diseases. They should also avoid walking in chicken droppings.

Try to have as many birds as possible so that participants can practise administering the eye-drop many times.

NOTE: The I-2 and NDV4-HR vaccines are harmless to chickens and so birds can receive a dose many times above the recommended dose without risk. If you are not using the I-2 or NDV4-HR vaccines, then it may be best to administer water rather than diluted vaccine if there are only a few birds available for this session.

NOTE: If you are using droppers containing out-of-date vaccine for the training course, inform the participants that the vaccine being used in the practical sessions is not real, i.e. they should not be tempted to save the droppers for use on their own chickens at home. Farmers supplying the chickens should also be aware that this vaccine cannot be relied on to protect their birds.

3.4.2 Session 10 – Mobilising farmers and selling your vaccination service

Session objectives

1. To learn how to record vaccination details including the owner's name, number of birds vaccinated and payment received.
2. To learn how to prepare a price list that indicates the payment required to vaccinate from 1 to 40 chickens.
3. To present ways of raising the awareness of farmers about ND control prior to running a vaccination campaign.
4. To discuss how a vaccination campaign is planned in collaboration with the community.
5. To divide participants into groups that will prepare short role plays about different situations that may be encountered by vaccinators in the field.

Keeping Records

By keeping good records, participants will be able to see if they are working effectively.

Distribute a copy of the vaccination registration sheet and ask participants to comment on its contents (Figure 30).

This sheet contains the information that the vaccinator should record in his/her own exercise book. The sheet is to be filled in by the person supervising the vaccinators and the information it contains will help local authorities to monitor the progress being made in the area.

The information recorded on these sheets will be used for a number of important purposes, which are:

- To collect reliable and uniform information about ND vaccination campaigns;
- To help community vaccinators monitor and improve their work;
- To supply information to supervisors (extension agents) such that they can identify problems and help community vaccinators to improve how they work;
- To supply information to village communities, as well as ward, district and national supervisors, about the degree of success of previous campaigns and to plan for future campaigns; and
- To see if the campaigns are reducing chicken mortality from ND as well as the number of outbreaks of ND.

NOTE: The facilitator can draw a copy of the vaccination registration sheet in each of the participants' exercise books, using a double page of the books. This can then be used as a template for the vaccinators to copy.

It may help to only partially fill in the table and then work together with the participants to complete this table. This should then be checked to ensure that each participant has filled in the tables correctly.

A second table using a double page can also be drawn in each exercise book to register any comments during the vaccination campaign. (See Figure 31 for an example of this table.) This table will be especially useful for keeping track of any money owed for vaccinating the chickens.

Price List Preparation

 To help reduce the amount of work that vaccinators have to do on the day of vaccination, it is suggested that the vaccinators write a vaccination price list into the front of their exercise books. Use the local currency when doing this exercise with participants. An example is given in Table 4.

TABLE 4: AN EXAMPLE OF A PRICE LIST FOR VACCINATING 1 TO 10 AND THEN 20, 30, 40 AND 50 BIRDS.

No. of chickens	Price of Vaccination*
1 bird	ZMK 0.5
2 birds	ZMK 1
3 birds	ZMK 1.5
4 birds	ZMK 2
5 birds	ZMK 2.5
6 birds	ZMK 3
7 birds	ZMK 3.5
8 birds	ZMK 4
9 birds	ZMK 4.5
10 birds	ZMK 5
20 birds	ZMK 10
30 birds	ZMK 15
40 birds	ZMK 20
50 birds	ZMK 25

* Assuming a price of 50 ngwee (ZMK 0.5) per bird.

If you are unable to provide correct change to farmers, arrange a way to repay the money owing at a later date or give them credit for the following campaign. The amount of credit owing to particular farmers can be recorded in the 'Observations' columns of the registration sheet.

NOTE: It may be useful if the local veterinary authority prepares a vaccination price list on letterhead paper for the vaccinators to carry in the field. This official list can be used by the vaccinators to prove to farmers that the prices being charged are the official prices.

Figure 30: *An example of the form used to register farmers' names and the number of birds vaccinated.*

Section_____ **EPA**_____ (start a new form for each new EPA)

Name of head of household	Sex (M, F)	First Campaign Vaccine Batch number				Second Campaign Vaccine Batch number				Third Campaign Vaccine Batch number			
		Number of chickens registered Month:	Number of chickens vaccinated Month:	Number of chickens owned	Payment made	Number of chickens registered Month:	Number of chickens vaccinated Month:	Number of chickens owned	Payment made	Number of chickens registered Month:	Number of chickens vaccinated Month:	Number of chickens owned	Payment made

Vaccinator _____Date_____. Vaccinator _____Date_____. Vaccinator _____Date_____.

Ext. officer_____Date_____. Ext. officer_____Date_____. Ext. officer_____Date_____.

Figure 31: *An example of the form used to register comments for each family in each campaign.*

Name of Household	First Campaign	Second Campaign	Third Campaign

Problems with vaccine:

Problems with chicken deaths:

Other problems:

More or less farmers vaccinating:

More or less chickens being vaccinated:

Keeping Records

By keeping good records, participants will be able to see if they are working effectively.

Distribute a copy of the vaccination registration sheet and ask participants to comment on its contents (Figure 29).

This sheet contains the information that the vaccinator should record in his/her own exercise book. The sheet is to be filled in by the person supervising the vaccinators and the information it contains will help local authorities to monitor the progress being made in the area.

The information recorded on these sheets will be used for a number of important purposes, which are:

- To collect reliable and uniform information about ND vaccination campaigns;
- To help community vaccinators monitor and improve their work;
- To supply information to supervisors (extension agents) such that they can identify problems and help community vaccinators to improve how they work;
- To supply information to village communities, as well as ward, district and national supervisors, about the degree of success of previous campaigns and to plan for future campaigns; and
- To see if the campaigns are reducing chicken mortality from ND as well as the number of outbreaks of ND.

NOTE: The facilitator can draw a copy of the vaccination registration sheet in each of the participants' exercise books, using a double page of the books. This can then be used as a template for the vaccinators to copy.

It may help to only partially fill in the table and then work together with the participants to complete this table. This should then be checked to ensure that each participant has filled in the tables correctly.

A second table using a double page can also be drawn in each exercise book to register any comments during the vaccination campaign. (See Figure 30 for an example of this table.) This table will be especially useful for keeping track of any money owed for vaccinating the chickens.

Interval

Planning an Extension Campaign to Raise Awareness about ND and its Control through Vaccination

This is a very important part of the training course. The trainer must work as a facilitator to help the participants develop an extension strategy that is cost-effective, based on available resources, socially acceptable and promotes communication with village chicken farmers.

Try to ensure that the vaccinators and their supervisor use a range of methods. For example:

- The extension workers and vaccinators might like to develop their own role play that they perform during community meetings to facilitate discussions;
- The vaccinator or the extension worker might present the ND flip chart and have an open discussion afterwards;
- Farmers may join together with vaccinators or extension workers to listen to the radio at times when messages dealing with ND control are broadcast;
- Mobile loud hailers may be used to alert farmers that the vaccination campaign will take place the following day or that it has already started;
- The extension worker might talk about ND control at the local primary school or other locations where people meet; and
- Vaccinators might like to visit farmers house by house after a general community meeting has been held to assess the level of interest and to answer specific questions that farmers might have.

Planning a Vaccination Campaign with Community Participation

 Ask the participants to list the activities necessary to implement a vaccination campaign. Write the suggestions down and divide them up according to when they are done: one month before, one week before, one day before, and the day of vaccination. Make sure that the activities listed below appear on the plan.

NOTE: Easy access to the vaccine is critical to the success of ND vaccination campaigns. It is pointless having trained community vaccinators who are unable to obtain the vaccine. Distribution of the vaccine by local structures – such as the Government Veterinary Services or private pharmacies – must commence in the early phases of the project. While it is tempting for project staff to delier the vaccine to community vaccinators, this approach will prevent the development of sustainable distribution systems.

1. One to Two Months before the Campaign

Community Awareness Raising

Vaccination campaigns start with informing the community about the campaign and involving them in the planning and implementation of the campaign. Village leaders should be informed and a village meeting should be held to discuss the campaign. The VEO and/or WEO should be present as well as the community vaccinator. A presentation on ND and vaccinating chickens can be given and any doubts or questions can be answered. The community can then discuss how they want to implement the campaign.

How Many Doses of Vaccine? (Chicken Registration)

The next step is for the community vaccinator to visit individual households. Vaccinators can discuss any further queries with each family and ask for an estimate of the number of chickens that the farmer will be vaccinating. It is also important to clarify how much it costs to vaccinate each chicken (50 ngwee, ZMK 0.5). The vaccinator can then inform the VEO/WEO how many doses of vaccine will be needed so that the vaccine can be ordered in time to arrive in the village.

When to Vaccinate

- Decide in consultation with farmers. Consider weather conditions, the farmers' weekly and annual work plan and the pattern of Newcastle disease outbreaks;
- Begin campaigns at least one month before the season when Newcastle disease outbreaks are more common. Remember that birds need one to two weeks to develop a strong defensive response to the vaccine;
- Campaigns are frequently best held during the weekends or school holidays so that children are home to help catch the chickens; and
- Postpone the vaccination campaign if is suspected that an outbreak of Newcastle disease is in progress.

Where to Vaccinate

- Decide, in consultation with farmers, the location of vaccination:
    - At home, with the vaccinator doing house-to-house visits; or
    - At central vaccination points, for example at village meeting centres.

Visiting the homes of individual farmers is more work for vaccinators but it decreases the risk of transmission of diseases between birds owned by different farmers and also decreases the likelihood that birds will escape into an unknown area.

2. One Week to One Day Before the Campaign

Materials

Make sure that you have all the necessary materials:

- Vaccine, of appropriate quality and quantity;
- Registration book to record farmers' names, number of birds vaccinated and payment received;
- A suitable container for transporting the vaccine;
- Organise some small coins or notes (e.g. 50 and 100 ZMK) to give as change to farmers paying for vaccination; and
- Write a price list in the registration book to assist with the collection of the vaccination fees. The list should show the price of vaccinating one bird through to 30, depending on the average size of a flock.

Campaign Promotion

Promote the days and times of the vaccination using a range of methods such as:

- Vaccination leaflets posted in strategic places;
- Short presentations at community gatherings such as schools and churches;
- Using a loudspeaker;
- Reminding village leaders and asking them to inform the community; and
- Community radio stations.

3. On the Day of Vaccination

If you do not have a cool box and ice, wrap the vaccine in a damp cloth and put it in an open weave covered basket or similar container. At each household, remember to discuss the following:

- Ask the farmer if all of his/her birds are in good health;
- Ask the farmer to help hold the birds for vaccination if necessary and show him/her how to hold the bird with the head to one side so that you can easily administer the eye drop;
- Check that the farmer understands that the vaccine will protect against ND only;
- Do not promise that all vaccinated birds will survive;
- Mention that birds in poor condition or infested by parasites may not respond well to the vaccine;
- Remind the farmer that birds should be revaccinated every 4 months;
- Let the farmer know that you will pass by again after the vaccination to check that everything is going well and to plan for the next campaign;
- Birds may be eaten immediately after vaccination if necessary;
- Ask the farmer if he/she has any questions;

- Record the farmer's name, the number of birds owned and number vaccinated;
- Examine each bird to make sure that it is healthy before you vaccinate it; and
- Vaccinate the birds away from direct sunlight, e.g. in the shade of a tree.

4. After the Vaccination Campaign

Monitoring and Evaluating your Work

- You should arrange to meet the AEDO and/or AVO about one month afterwards to discuss the campaign and give him/her the vaccination data.
- When preparing for the next campaign, discuss the previous campaign with village leaders and at community meetings to try and resolve any problems and improve future campaigns.
- To monitor vaccination, try to visit farmers
  - One week to one month after vaccination to confirm that vaccinated birds are healthy and
  - Two to three months after vaccination to monitor chicken numbers, farmer attitudes to vaccination and to prepare for the next campaign.
- If your work is progressing well, you should observe:
  - an increase in the number of chickens per family/household;
  - farmers continue to participate in subsequent vaccination campaigns;
  - new farmers present their chickens for vaccination at each campaign;
  - payment received from farmers for the vaccination of their chickens is sufficient to buy vaccine for the following campaign and to cover any transport or labour costs involved.

What support should be provided by supervisors?

Make sure that extension workers and livestock officers are aware of the part that they should play in this process. The supervisor may not always be present on vaccination day, but they should be sure that the vaccinators have everything they need to do the vaccinations. Supervisors should arrange to meet with vaccinators after each campaign to discuss the successes and problems they encountered.

Role play

Role plays can help participants to prepare for situations that they may encounter during the vaccination campaigns.

Role playing

Role playing involves asking participants to act out some scene or situation. Role playing allows participants to think about issues that are likely to be raised during field work, and to develop appropriate ways of dealing with them while still in a safe, non-threatening environment. It is also a good way to get people participating and break down inhibitions.

A role play is like a very short play, acted by the participants. Each of the players is given clear instructions as to who their character is, and what position or attitude they have. The players then act out the play, making up the dialogue as they go along. Usually, a role play involves some sort of conflict or disagreement that the actors need to resolve.

Cameron (1999).

 Ask the participants to divide into three or more groups (either they can form their own groups or the trainer can ask the participants to number off from 1 to 3, with all participants who were number one joining the same group, etc.). Ask each group to prepare a play during the next interval. The play should last for 5 to 10 minutes and present one or more of the following topics:

- A farmer presenting a sick chicken for vaccination;
- A farmer that wants his/her chickens vaccinated but does not want to pay; and
- A vaccine distributor or extension worker or livestock officer informing the vaccinator that the vaccine has not arrived in time to start the vaccination campaign.

Interval – participants should use this time to prepare their various drama pieces.

3.4.3 Session 11 – Signs of Success

Session objectives

1. To present the role plays prepared during the interval by the participants.
2. To discuss how a vaccinator can be sure that his / her work controlling ND is going well.
3. To practise again the use of an eye-dropper.

Presentation of Role Plays

After each presentation, encourage everyone to discuss the play and to come to a group decision as to the best way to solve the problem presented.

How Community Vaccinators Can Be Sure That Their Work is Going Well

 Ask participants to contribute to a list of the ways they will know that their work as community vaccinators is going well. The list should include:

- No complaints from farmers whose chickens were vaccinated;
- An increase in the number of chickens per family/household that vaccinated their chickens;
- Farmers continue to participate in subsequent vaccination campaigns;
- New farmers present their chickens for vaccination at each campaign;
- Most of the doses in the vaccine dropper are used; and
- Payment received from farmers for the vaccination of their chickens is sufficient to buy vaccine for the following campaign and to cover any transport, equipment or labour costs involved.

How Extension Workers and Supervisors Can Be Sure That Their Work is Going Well

It is important that extension workers and their supervisors also evaluate the ND control program. Ask extension workers to make a list that will help them evaluate their work. Once the program has been underway for at least one year, the following should be evaluated.

- All of the above criteria for community vaccinators;
- Percentage of community vaccinators continuing to vaccinate chickens;
- Number of new community vaccinators trained or number of farmers requesting training as community vaccinators;
- Change in the numbers of vaccine droppers being distributed;
- Change in the frequency of ND outbreaks;
- Degree of confidence that farmers have in the extension workers; and
- Village chicken production should be evaluated at the household level to confirm that the number of chickens has increased, home consumption of chickens and eggs has increased and the sale of chickens and eggs has increased.

Monitoring and Evaluation at the End of Each Campaign

The process of regularly collecting information that will allow us to improve each vaccination campaign is an important aspect for the control of Newcastle disease. If useful information is collected about each campaign then this information can be used to help everyone to improve the way future campaigns are organised.

At the end of each campaign an extension officer will visit the community vaccinators to discuss how well the campaign went. The extension officer will also copy down the information recorded in the vaccinator's field book. Remember that the extension officer is not there to act as a police officer, but to help the vaccinators with any problems they may have. The information the extension officer collects will also be used to try and improve future campaigns.

Besides the information in the monitoring forms, extension agents, with the help of community vaccinators will also prepare short report about the vaccination campaign. Information that could be included in these reports is:

- Difficulties relating to the organisation of the campaign;
- Difficulties relating to the supply and distribution of the vaccine;
- Difficulties in receiving payment for the vaccine (either from vaccinators or chicken owners);
- How long it is taking vaccinators to use a dropper of vaccine;
- What chicken owners think about the vaccination campaigns;
- What vaccinators think about the vaccination campaigns; and
- Any other difficulties or problems relating to ND vaccination campaigns

3.4.4 Session 12 – Looking ahead

Session objectives

1. To discuss any comments or questions that participants may have about any of the topics discussed during the course.
2. To prepare a work plan for the vaccinators and their supervisors.
3. To evaluate the course (participants).
4. To make final recommendations to vaccinators (trainers).
5. To present the certificates of participation.
6. To thank all those involved with the training and officially close the course.

This is the final session of the training course. Ask the participants if they have any questions of comments about any of the topics discussed dueing the course. Go through the list and confirm that each objective has been successfully achieved.

Annual Work Plan

Assist the vaccinators and their supervisors to construct a program of activities over the coming year. This should be copied into the participants' exercise books. The first month in this plan need not be January, and can be selected according to local conditions and the time of the year when the training course is held. Ensure that the list includes coordination meetings between vaccinators and their supervisors as well as field work (Figure 32).

Monthly Activities	1	2	3	4	5	6	7	8	9	10	11	12	Group/People responsible
Month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	
Training	X				X				X				Everyone
Meet with extensionist	X				X				X				Vaccinators, extensionist
Raise awareness of farmers		X				X				X			Vaccinators, extensionists
Chicken registration		X				X				X			Vaccinators, extensionists
Order vaccine		X				X				X			Vaccinators, extensionists, distributors
Distribute vaccine		X				X				X			Distributors
Vaccination campaign			X				X				X		Vaccinators, extensionists
Visit farmers to check on success				X				X				X	Vaccinators
Monitoring and report writing				X				X				X	Vaccinators, extensionists, district and regional supervisors

Figure 32: *An example of an annual work plan.*

If the participants are not used to drawing up work plans as tables, then they can write down their planned activities as a checklist.

It is important for the participants to be aware that their work involves more than one vaccination campaign and that they must make plans for the whole year. However, they should first concentrate on making detailed plans for the coming vaccination campaign, so that they understand all of the steps they should include. (See section 9 for a description of the activities they should include.)

NOTE: If it is not possible for their supervisors (extension workers) to be present when constructing this plan, it is important that the participants meet with their supervisors soon after the course to discuss and coordinate the plan.

Evaluation Session

1. **Evaluation of the participants by the trainer**. . It is always recommended to evaluate formally the acquisition of knowledge and changes of attitude promoted during the training. You may wish to ask them to do a written test using the suggested list of questions to be found in Appendix 4.

   Feedback on the results and main problems found during the analysis of the formal evaluation should be given to the participants before the end of the training. For this reason the application of the questionnaire should be done early enough to allow for their analysis before the closing ceremony.

   This formal evaluation allows you to evaluate your own performance an ability to train vaccinators.

   If some of the vaccinators did not understand some of the issues tackled during the training it might be important to clarify this aspect right now, to ask them to look at their training material, to consider a refresher meeting around this specific issues, or to stress this point during supervision visit.

2. **Evaluation of the course by the participants**. You will have worked with the participants all week and should know by this stage the best way to conduct this session. You may wish to open the session up for comments from the vaccinators or you may wish to start by asking a series of questions. For example,
   - Was the way I spoke easy to understand?
   - How was the information presented? **Was it clear?**
   - Were the written and illustrated materials **useful?**
   - What was the most difficult part of the training course?
   - Do you have any suggestions as to how this part might be improved?
   - What was the most interesting part of the training course? Why?
   - Was the training course well organised? Why?

Ask participants to outline the problems that they expect to encounter while implementing ND vaccination campaigns. This question is extremely important as it is a way for the vaccinators to express their concerns and the difficulties they think they might face in the future. This discussion session will allow the organiser to solve problems that might hamper a good vaccination campaign.

3. Distribution of a kit to all participants
   Before the end of the training each participant should receive a complete kit of material to carry out awareness activities and the vaccination campaign. Enough posters should be distributed to them for advertising the campaign. A calendar and a flip chart should also be given to each of them.

4. Closing ceremony with presentation of certificates of participation to the vaccinators (an example is given in Appendix 8). Try to organise for the District Agriculture and Livestock Development Officer to present the certificates and perform the closing ceremony.

3.5 The Departure of Participants and Trainers – Day 4

Ensure that

- Each vaccinator leaves with a complete kit;
- Transport is arranged for all;
- Each vaccinator is aware of who their direct supervisor is and how that person may be contacted;
- The managers of the training venue are satisfied; and
- Each participant has a clear idea of what they must do between the end of the training course and the first vaccination campaign.

SECTION 3

AFTER THE TRAINING COURSE

4.0 MONITORING, EVALUATION AND ONGOING EDUCATION OF COMMUNITY VACCINATORS

4.1 Monitoring and Evaluation

This is an essential part of a ND control program (Alders and Spradbrow 2001).

- **Timing and frequency.** Monitoring of activities should occur at regular intervals to enable timely adjustments to be made.
  - One week to one month after vaccination, the community vaccinator should confirm that birds are healthy following vaccination;
  - Three months after vaccination is an ideal time to monitor chicken numbers; farmer attitudes and to prepare for the following campaign if vaccination is being done every four months via eye drop; and
  - Supervisors should meet with community vaccinators on a regular basis. During these meetings the community vaccinators may wish to ask questions as well as report on their work.
- **Participatory process**. Make sure that all those involved with the control of ND are involved in the evaluation process, for example community representatives (male and female), chicken traders, livestock officers, extension workers, veterinarians, government officials, and project staff.
- **Indicators**. All those involved should have a say in defining the indicators of success. Possible indicators may be:

  Short-term changes in:
  - household chicken numbers;
  - the number and type (e.g. gender and/or wealth status) of people participating in vaccination campaigns;
  - the level of community involvement in campaigns;

  Medium term changes in:
  - the number and diversity of livestock species raised;
  - the number of chickens sold or traded;
  - home consumption of chickens and eggs; and
  - the economics of households.

  Long-term changes in:
  - the number and diversity of livestock species raised;
  - the demography of households; and
  - primary school enrolment statistics.

Ultimately, the question which needs to be answered is whether the control of ND has assisted in poverty alleviation and improved food security.

4.1.1 Compilation of Vaccination Records

These records are required to monitor the impact of ND control activities. Provide examples of sheets to record vaccination details at the district and provincial levels (included in the Manual for Extension Workers).

4.1.2 Feedback from Community Vaccinators

Learning from vaccinators about their experiences provides valuable information that will assist you to improve your training of other vaccinators in future training sessions. Community vaccinators may go on to become community livestock workers if there is support within the community for a person who can treat and control a range of livestock diseases and production problems.

4.1.3 Feedback from Community leaders

Community leaders like to be informed and consulted in relation to any activity in the area under their influence. It is extremely important to consult, inform and involve them in all the activities related to the vaccination campaign. They are key people to create awareness, help organise the vaccination campaigns and ensure payment for vaccination by farmers to vaccinators.

4.1.4 Feedback from farmers

Male and female farmers need to be consulted and involved as much as possible in the planning and evaluation of the vaccination campaign. They are the clients of the vaccinators and should be fully satisfied with the way the activities are carried out by extension services and vaccinators. Their comments and suggestions should be valued by all stakeholders.

4.1.5 Economic Sustainability of ND Control Activities

For ND control activities to be sustainable in the long term, all costs associated with the production (or importation), distribution and use of the vaccine must be covered (Figure 33). In some instances, village chicken farmers may be expected to pay all of the costs. In many cases, government or development agencies may subsidise some aspects of the control activities with the remainder being paid for by farmers (Alders 2001).

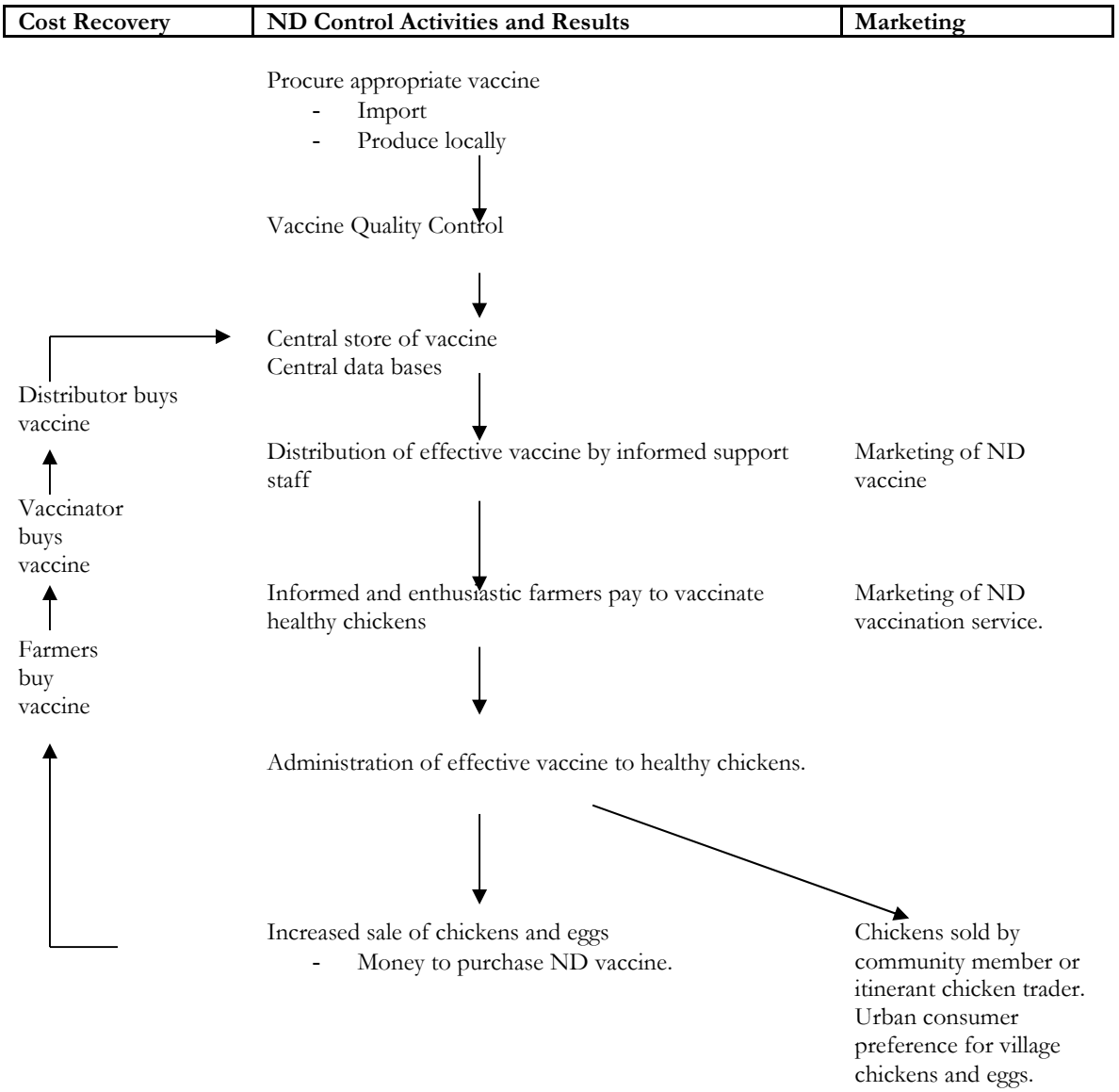


Figure 33: *Cost-recovery and marketing activities linked to the sustainable control of ND in village chickens (Alders, Spradbrow, Young, Mata, Meers, Lobo and Copland 2001).*

4.1.6 Program Monitoring

This manual focusses on field activities but it is important to remember that every aspect of the ND control program must be monitored to ensure that the program is working efficiently (Table 5).

TABLE 5: GENERAL INPUTS AND ACTIVITIES REQUIRED TO MOUNT A ND CONTROL PROGRAM AND INDICATORS THAT CAN BE USED TO EVALUATE THE EFFICIENCY OF THE PROGRAM (ALDERS, ET AL. 2001)

Input/Activity	Indicators
Procure appropriate vaccine - Import - Produce locally	Quantity of vaccine produced or imported. Value of vaccine sales in comparison to actual costs of importation or production.
Vaccine Quality Control - Efficacy - Potency - Safety	Quality Control test results.
Central store of vaccine Central data bases (veterinary and socio-economic)	Maintenance of central cold store. Nº of doses & droppers of vaccine distributed nationally. Value of vaccine sales nationally. Nº of chickens vaccinated nationally. Nº per year and timing of vaccination campaigns. Incidence of ND outbreaks. National village chicken population. Socio-economic indicators.
Distribution of effective vaccine and extension material - Appropriate accounting procedures - Vaccine conservation - Information package	Maintenance of provincial cold stores. Appropriate extension material available for farmers, field staff and decision makers. Nº of doses & droppers of vaccine distributed in each province. Value of vaccine sales per province. Nº of chickens vaccinated in each province. Nº per year and timing of vaccination campaigns. Incidence of ND outbreaks per province. Provincial village chicken population.
Informed and motivated support staff	Nº of staff (male and female) involved in ND control activities. Nº of staff with acceptable knowledge of ND control. Nº of meetings between supervisors and extension workers and community vaccinators. Quantity and type of refresher courses. Value of vaccine sales per district. Identification of other diseases and production constraints.
Informed and motivated District and village leaders	Nº of leaders participating in meeting to receive sensitisation around ND vaccination campaign Nº of meetings with male and female district and village leaders Nº of leaders (male and female) participating in and paying for vaccination.
Informed and enthusiastic farmers	Nº of farmers (male and female) participating in and paying for vaccination. Nº of community vaccinators (male and female) working one year after initial training. Nº of community vaccinators working one or two years after the end of the project.
Ongoing and systematic administration of effective vaccine to healthy chickens.	Nº of chickens vaccinated per household. Nº of chickens vaccinated per locality and district. Nº of doses and droppers of vaccine used by vaccinators. Nº per year and timing of vaccination campaigns in each locality. Vaccination costs (price of one dose and administration fee per chicken).
Increased Nº of chickens and eggs	Village chicken population per locality and per district. Incidence of ND outbreaks per locality and per district. Nº of chickens and eggs sold. Nº of chickens and eggs consumed. Nº and type of livestock owned by male and female staff. Nº of children attending school. Malnutrition rate in villages.

4.2 Dealing With Surplus Chickens and Eggs Once Your ND Control Campaigns Are An Ongoing Success

Once a ND control program is functioning well, the problem may well be what to do with the surplus chickens and eggs! In many areas, large markets may be some distance from the areas where chickens are produced and/or cultural taboos may prevent certain members of the family from eating eggs or chickens.

For many farmers, village chickens are a living bank account. The sale of chickens or eggs can resolve many problems that rural families face, such as the payment of school fees, purchase of clothes or medicines or essential food items like oil or salt. The sale (or barter) of chickens can also enable farmers to acquire other domestic animals such as pigs, sheep, goats and cattle.

4.2.1 Tips for Marketing Surplus Chickens and Eggs

- Let chicken traders in central markets know about areas where farmers are vaccinating against ND. Tell them that they will always find chickens to buy if they make the effort to visit these areas. ND also causes problems for chicken traders because it can be difficult for them to buy birds at a reasonable price after an outbreak. Traders can also lose money if birds purchased from many different houses and areas become infected with ND and die before reaching the market.
- Encourage the local communities to select their own chicken traders. Just as the community has chosen community vaccinators, they can also choose people to take their surplus birds and eggs to central markets for sale. This way the farmers are more likely to get a fair price for their birds and the profits involved in chicken trading are more likely to stay within the community. Training may be required to ensure that sales are fairly distributed and that trips to central markets are made when buyers are more likely to have money (i.e. the first week after government salaries are paid) and when major festivals are about to take place (e.g. religious or secular holidays).
- Organise market days, maybe on a monthly basis, and invite chicken traders, restaurant owners, etc. to attend.

4.2.2 Encouraging Families to Eat More Chickens and Eggs

In many areas, farmers are reluctant to eat surplus chickens or eggs and in some regions, the consumption of eggs is prohibited for children and women by tradition. The conservation of eggs and the hatching of chickens are important in situations of high chicken mortality, where replacement birds are essential. If sustainable ND control programs can be implemented and chicken numbers increase, then the consumption of eggs becomes an option and a very good use of resources. The egg provides a range of nutrients apart from protein and could make a substantial contribution to the nutrition of children, and pregnant and nursing women.

In many parts of the developing world, child malnutrition remains a serious problem. Malnutrition in children under the age of five years can affect their whole life. But if young children eat well, they will grow well, be healthier, do well at school and be strong physically.

Collaborate with colleagues working with human nutrition within the Ministries of Health and Education to raise the awareness of families about good eating practices and the contribution that chickens and eggs can make to good health.

4.3 Collecting Information Concerning Other Constraints to Village Chicken Production

In collaboration with farmers and vaccinators, prepare further training sessions dealing with other issues associated with village chicken production.

Once ND control activities are underway, it is useful if the cause(s) of mortality among vaccinated birds can be diagnosed. Vaccination against ND cannot provide protection in 100 % of birds and this message must be clearly understood by all those involved. Also, it is important to diagnose other diseases that will become more apparent (and consequently, more important) once chicken numbers increase as a result of the control of ND.

Guidelines for the diagnosis of ND in the field and the collection of samples for laboratory diagnosis have been included in "Controlling Newcastle Disease in Village Chickens: A Manual of Extension Workers".

An introduction to the treatment and control of external parasites, internal parasites, Fowl cholera and Fowl pox may be found in Appendix 5. Information on other diseases of importance to village chicken production may be found via the internet at: http://www.kyeemafoundation.org/irpc.

5.0 CONCLUSION

A successful training session results in vaccinators who understand their work, have the necessary practical skills and a willingness to get the job done. It also provides the trainer with a better knowledge of village chicken production in the area. Effective training requires commitment, good planning and ongoing communication with trainees. Ongoing education is part of effective training and is an important way of increasing efficiency in work practices. This fits perfectly with a long-term strategy to control ND as refining control procedures is a continuous process and farmers will also encounter other problems in their chickens and other domestic animal species, the control of which may require that the vaccinator receive further training to become a community livestock worker.

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SECTION 4

APPENDICES

APPENDIX 1: OTHER MATERIAL ON ND CONTROL

ACIAR and SANDCP Material

A ND field manual - a 112 page manual entitled 'Controlling Newcastle disease in village chickens: A Field Manual', aims to provide information to senior veterinarians and veterinary field staff on ND and its control.

A ND laboratory manual – details the small scale production and quality control of live, thermotolerant ND vaccine.

A flip chart - an illustrated A3 flip chart, with clear, largely self-explanatory line drawings and an accompanying narrative. It can be used for training and in the field, with farmers, to explain the characteristics of the vaccine and its application. Local frontline extension staff should translate the narrative into the appropriate local language.

A poster - including a close-up photo of a chicken being vaccinated. The poster provides space for the local vaccinator to write the place, date, time and contact person for the next ND vaccination campaign.

A pamphlet - provides an introduction to ND and its control. It is printed on both sides of an A4 sheet and is easily reproduced. It is useful for front line extension staff, literate farmers, farmers' associations and school children.

A ND vaccination calendar - this calendar highlights the months in which vaccination campaigns should be implemented, prompts vaccinators to get their orders for vaccine in well before the campaign begins and reminds distributors when they should have the vaccine in stock.

An audio-cassette with radio programs - a radio drama and a question and answer program in Kiswahili will be available for broadcast on national and community radio.
Internet: http://www.kyeemafounation.org/irpc.php

FAO Material

FAO Technology Review Paper on Newcastle Disease in Village Chickens – A review providing information on Newcastle disease and its control in village chickens. It includes a description of ND, its diagnosis, epidemiology and practical control methods.

English version available from:

Improvements in Rural Poultry in Developing Countries Website
Internet: http://www.kyeemafoundation.org/irpc.php

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APPENDIX 2: MATERIALS AND EQUIPMENT REQUIRED FOR TRAINING

DISCUSSION SESSIONS

Item	Number of units	Comment
Blank flip chart or butcher's paper or white/black board, or alternative	1 – 2	For writing notes on at the front of the training area.
Name tags	1 per participant	Can be made using index cards and safety pins to save money.
Adhesive	1 packet	Adhesive such as Bostik™ or Blu Tac™ is useful for sticking sheets of paper to the wall.
Overhead projector (optional)	1 projector	Not essential but useful if available. Access to a second projector is handy should the first one break down. Arrange a spare bulb.
Overhead projector sheets, suitable for photocopying (optional)	1 box of 50 sheets	Sufficient to copy the illustrations required for the training sessions and some extras for writing notes. Required only if using an overhead projector.
Felt pens or chalk	2 or 3, each a different colour	To write on the flip chart or board.
Exercise books	1 per participant	For each participant to record information during the training session. Hard cover books are best as the vaccinators will go on to use these books to record their field activities.
Pens or pencils	1 per participant	For writing during the course. Black or blue pens are best.
Newcastle disease control flip chart	At least 1 copy	If you have funds, it is useful for each participant to receive a copy of the ND control flip chart. These are available from CVL.
Extension material: poster, calendar; basic instructions for vaccine use; a guide to organizing a vaccination campaign, etc.	1 of each per participant	See Manual for Extension Workers for copies of these materials.
Vaccination registration sheets	1 per participant	To record farmers' names and the number of chickens vaccinated. See Manual for Extension Workers for copies of these materials.
Certificate of participation	1 per participant	Please contact CVL.

PRACTICAL SESSIONS

Item	Number of units	Comments
Vaccine	2 droppers per participant	Out-of-date droppers of vaccine may be used for practical sessions where chickens are not vaccinated.
Chickens	1 per two participants	If at all possible, try to use village chickens and do the practical sessions with chickens at farmers' homes. If this is not possible, make sure that you have adequate conditions to house the chickens during the course.
Village chicken farmers (optional)	Variable	If it is possible to practise vaccination in the village situation, participants will have an opportunity to practise speaking with farmers about vaccination against ND.
Thermometers	3	These should measure ambient temperatures from 0 to 50 ºC (i.e. not clinical thermometers) as they will be used to check the internal temperature of containers to be used to transport vaccine.
Woven baskets and other options for transporting vaccine	3	Required to choose the type of local container that would be most appropriate for the transportation of vaccine
Cotton cloth	3	Used to wrap the vaccine in before placing it in the vaccine transport container. Need not be new.
Cool box	1 per participant	If the areas where you are working are sufficiently wealthy, you may decide to issue participants with a cool box to transport the vaccine. To make this decision ask three questions: 1. Can the vaccinator afford to buy a cool box after the project finishes? 2. Are cool boxes available for purchase locally? 3. Is ice available locally? If the answer to any of these questions is "no," then it is recommended that you do NOT provide cool boxes.

APPENDIX 3: A KIT FOR COMMUNITY VACCINATORS

When vaccinating in the field

- ND Vaccine;
- Cool box and ice pack or damp cotton cloth and open-weave basket; and
- Record book and pencil.

Other material

- Flip chart
- The booklet titled "Controlling Newcastle Disease in Village Chickens: a Manual for Community Vaccinators"
- Access to posters and pamphlets for publicising the campaign
- A current calendar with vaccination months

APPENDIX 4: FORMAL EVALUATION OF PARTICIPANTS

Question	Answer
What type of container can you use to transport vaccine in the field?	Cool box and ice pack, or Woven basket and damp cloth.[2]
How many times a year should chickens be vaccinated against ND? Why?	3 times a year by eye drop, because the level of protection starts to fall after 4 months.
Can chicks be vaccinated? At what age?	Yes, from one day of age.
Can you vaccinate cockerels?	Yes.
Should a sick chicken be vaccinated?	No.
For how long can you use a dropper of I-2 vaccine once it has been opened?	3 days
What are the ways that ND can be spread around?	ND can be spread by people, cars, animals, baskets, cages and sick birds that came into contact with the particle that causes the disease and the remains of birds (feathers, bones, etc.) that died of ND.
How should the vaccination of birds be organised?	In collaboration with farmers and with government livestock and extension services. 1. Community awareness raising 2. Chicken registration 3. Decide with the community when and where to vaccinate 4. Organise all necessary materials 5. Campaign publicity 6. Vaccinate chickens 7. Monitor and evaluate campaign
If you have any problems with the vaccination campaign what will you do?	See your local extension officer for assistance
How will you know if your vaccination work is going well?	1. No complaints from farmers whose chickens were vaccinated; 2. An increase in the number of chickens per family/household; 3. Farmers continue to participate in subsequent vaccination campaigns; 4. New farmers present their chickens for vaccination at each campaign; 5. Most of the doses in the vaccine dropper are used; and 6. Payment received from farmers for the vaccination of their chickens is sufficient to buy vaccine for the following campaign and to cover any transport, equipment or labour costs involved.

[2] The answer depends on what type of container was used during the training session.

APPENDIX 5: CERTIFICATE OF PARTICIPATION – AN EXAMPLE

APPENDIX 6: INTRODUCTION TO THE CONTROL OF OTHER POULTRY DISEASES

Control of External Parasites

- Management, good housing and hygiene.
- Remove bark from timber used to construct shelters to reduce hiding places for ticks and mites. If possible, timber should be painted with a mixture of paraffin (kerosene) and creosote in equal amounts or with nicotine sulphate (40%).
- Clean shelter and nests regularly, at least every week.
- Place chicken manure on gardens and mix into soil. This will prevent flies from developing in the manure.
- Keep brooding hens free from fleas and lice to prevent infestation of young chicks. When heavy infestations occur, it is best to burn the chicken house or nest and build a new one on a different site. In some areas, farmers will be aware of the leaves of some local plants that if placed around the nest will discourage external parasite infestations.
- Allow chickens to bathe in sand or ash to clean their feathers.
- Apply insecticide (trichlorphon or malathion) to individual birds and housing.
- Scaly leg of chickens can be treated by dipping the leg in paraffin (kerosene) and gently brushing the scales from the leg. The paraffin must not be allowed to touch the skin or feathers.
- Other poultry, dogs, cats and rats should be examined for fleas since they may serve to maintain flea invasions.
- Sunlight, hot dry weather, excessive moisture and freezing hinder development of fleas.

Control of Internal Parasites Including Coccidiosis

- Treatment of individual birds with tetramisole or levamisole is possible but expensive.
- It is best to prevent infection by frequent removal of manure from the chicken house, provision of feed and water on clean containers and allowing birds to sleep off the ground by providing roosts.
- Cages and houses should be kept clean with droppings removed every week.
- Droppings (faeces) should be broken up to ensure that worm eggs will be killed by drying as quickly as possible.
- Feed and water containers should be cleaned every day if possible.
- Do not allow wet, muddy areas to develop around water containers or anywhere else.
- Do not keep birds on the same area of ground year after year as contamination of the soil will increase.
- Biosecurity is not effective because coccidia oocysts are very resistant.
- Inclusion of coccidiostats in food or water is possible for commercial poultry production.

Control of Fowl Pox

- Management – do not introduce new birds with lesions.
- Virus survives in dried scabs for months or years. Burn infected chicken houses and dispose of all infected birds. Burn or bury all parts of the birds that are unused. After all infected birds have been removed and no new cases occur, build another chicken house on a new site.
- Vaccines are available.

Control of Fowl Cholera

- Treatment cannot be guaranteed to be successful.
- Vaccines are available but results not always satisfactory. Good results have been obtained in SE Asia when local isolates are used to prepare a vaccine.
- Good flock management – do not introduce sick or new birds.
- Control of rodents (construct elevated chicken houses with inverted metal or plastic cones on the legs to prevent the entry of predators).
- Bacteria are destroyed by disinfectants, sunlight and heat.

NOTE: More details on the control of these and other diseases may be found on the internet at:
International Rural Poultry Centre Website
http://www.kyeemafoundation.org/irpc.php
International Network for Family Poultry Development Website
http://www.fao.org/ag/aga/agap/lpa/fampo1/fampo.htm
Danish Network for Smallholder Poultry Development Website
http://www.poultry.kvl.dk