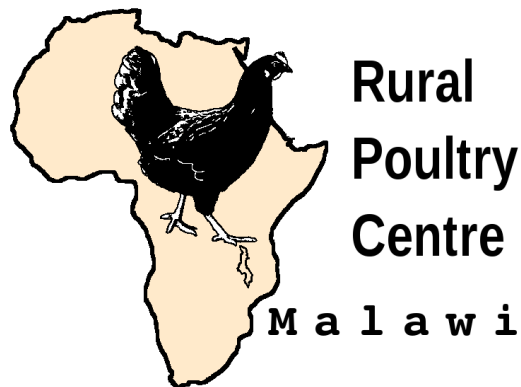


Newcastle disease
and Newcastle disease vaccination
in village poultry

A training manual



Rural Poultry Centre
PO Box 81
Likuni
Malawi

<http://www.ruralpoultrymalawi.org>



Acknowledgements and Introduction

This training manual has been compiled from several sources including an ACIAR monograph and a training manual prepared by the Small Scale Livestock and Livelihoods Program (SLLP) Malawi.

The extensive use in this manual, of knowledge, materials, and illustrations developed by the Kyeema Foundation and its subsidiary the International Rural Poultry Centre is sincerely and gratefully acknowledged as an invaluable resource.

The financial support given by the Australian government for printing of this manual is gratefully acknowledged. The Village Poultry for Better Livelihoods project is an initiative implemented by the Rural Poultry Centre in Malawi with support from the Australian Government and the Kyeema Foundation.

This manual is written for use by people responsible for training **Community Based Vaccinators** in the use of the I-2 strain of Newcastle disease vaccine. It is not designed to be a comprehensive technical manual on all aspects of Newcastle disease vaccination. Rather, it is designed to be well understood by a community member who will undertake vaccination of rural poultry. It is designed to convey in simple terms all the relevant information required by Community Based Vaccinators so that they can competently store and use the I-2 vaccine in rural areas of Malawi. It is necessarily simple and brief.

Every Community Based Vaccinator who is trained using this manual should be given a copy for future reference.

Copies of this manual can be downloaded from the Rural Poultry Centre web site at:

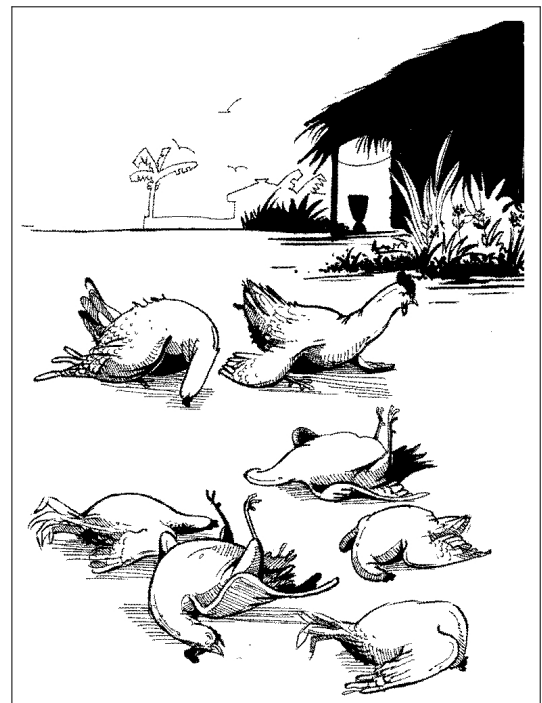
<http://www.ruralpoultrymalawi.org>

Contents

Section 1: About Newcastle disease	1
Section 2: Newcastle disease vaccination	6
Section 3: How to prepare for a vaccination campaign	9
Section 4: About the I-2 Newcastle disease vaccine	16
Section 5: Questions and answers	20
Newcastle disease vaccination record form	22
Newcastle disease vaccination reporting form	23
Monthly work plan	25

Section 1: About Newcastle disease

There are many diseases of chickens. Some are very important and kill many chickens. But our discussion today is about only one disease, Newcastle disease, the most important disease of chickens in Malawi. No other disease kills so many chickens. We will learn what Newcastle disease is and how to prevent it by vaccination.



What is Newcastle disease?

Newcastle disease is a disease of chickens and other birds. It appears periodically, perhaps one to three times in a year. It kills many chickens but some may survive. The disease then disappears for a few months before returning. Rural people know the disease and know of its behaviour.

What causes Newcastle disease?

Newcastle disease is caused by a tiny germ called a virus. There are many different types of germs and viruses but only one type causes Newcastle disease. Without the Newcastle disease virus, there can be no Newcastle disease.

How important is Newcastle disease?

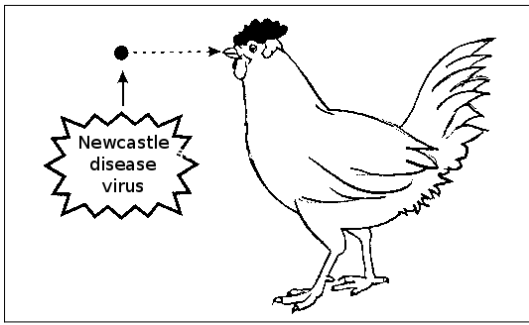
Newcastle disease is very important. It is the biggest killer of village chickens in Malawi. Other diseases or predators may kill chickens but they are not as common as Newcastle disease.

Where does Newcastle disease come from?

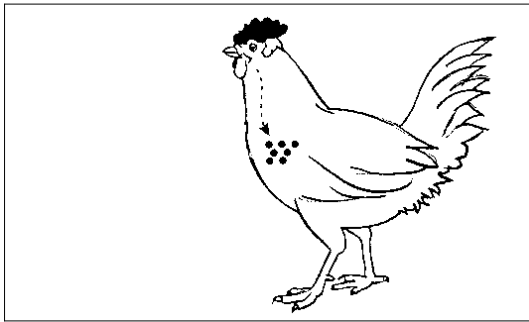
Newcastle disease appears when the virus gets into the chickens and makes them sick. The virus comes from other sick birds. Very often, the origin of the virus is other chickens which are sick with Newcastle disease. Sometimes however, wild birds can carry the virus to our chickens. Other times, the virus can be carried by people or baskets or other items such as people's hands.

How does the Newcastle disease virus make the chicken sick?

When the Newcastle disease virus first infects the chicken, it does not make the chicken sick immediately. That takes time, perhaps a few days, perhaps more than one week.

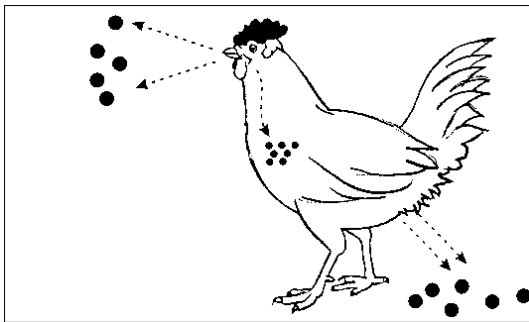


First the virus gets into the body of the chicken.



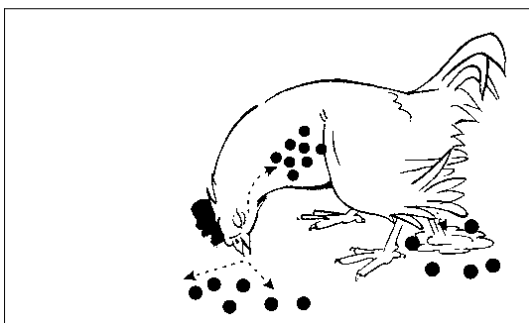
Then the virus multiplies inside the body of the chicken.

There are still not very many viruses in its body yet though, so the chicken is not yet sick.



Then the virus multiplies more and starts spreading from the chicken through coughing and through the droppings.

Now, the chicken is just starting to get sick. Now it can spread the virus to other chickens.



Then the virus continues to spread from the chicken through coughing and droppings.

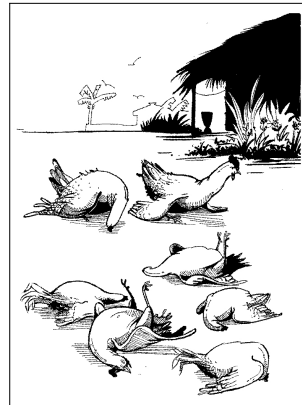
By now, the virus has damaged the body of the chicken and is making it very sick. The chicken will probably die within a day or two. It is still spreading the virus.

What are the signs of Newcastle disease?

When the virus gets into the body and makes the chicken sick, the chicken's wings will droop and its feathers may be ruffled.



Many chickens in the flock may be sick or dead.



Sometimes the disease affects the chicken's intestines. Then we may see greenish diarrhoea.



Sometimes the disease affects the chicken's brain. Then we may see twisted necks and erratic movements or chickens falling over.



Sometimes Newcastle disease is very severe in the flock and all the chickens die. Sometimes it is not so severe and a few die but many get sick.

How can we treat Newcastle disease?

First, let's make sure we are clear on one thing. Treatment of a disease and prevention of a disease are two different things. Some people do not know this.

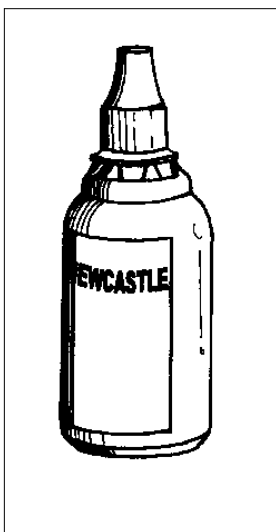
- **Treatment** means curing a disease after it has started to make the animal sick.
- **Prevention** means stopping the disease from causing sickness in the animal.

There is no treatment for Newcastle disease. Once the disease has entered a village, many of the chickens will die unless they have been vaccinated. Once the disease has infected a chicken, there is no medicine which can cure the chicken.

If someone tells you they have a herb or drug which cures Newcastle disease, they are probably wrong. Question them closely about how well it works. Many farmers have tried to cure chickens of Newcastle disease using traditional medicines but most will tell you that those medicines have little effect.

How can we prevent Newcastle disease?

The only effective way to prevent Newcastle disease in village chickens is to vaccinate the chickens. Vaccination is a simple and cheap procedure. There are several types of vaccines for prevention of Newcastle disease. Today, we will look at just one type of vaccine, which is known as I-2.



Central Veterinary Laboratory Mw
I-2 Newcastle Disease Live Vaccine
300 doses Store at 4-8°C
Administer by eye drop
Batch No. 999/999 Exp Date: 08/2020
For animal use only

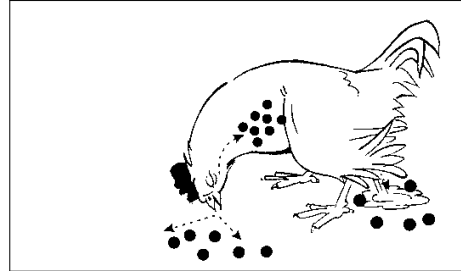
Section 2: Newcastle disease vaccination

How does vaccination protect the chicken?

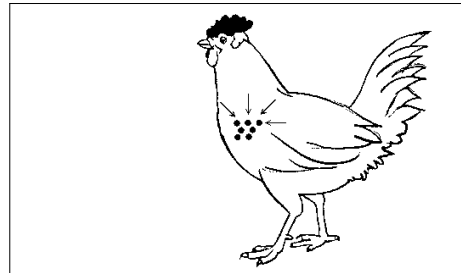
First, let us look at a typical case of Newcastle disease...

If Newcastle disease attacks a chicken, it will get sick after about a day or two. It will then probably die about a day or two later.

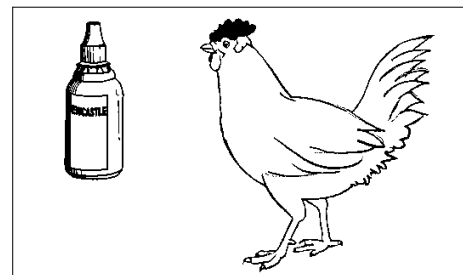
However, if the chicken is lucky and strong, it does not die but recovers. Its body then develops a defence mechanism which we call "immunity".



This immunity fights against the virus and the chicken gets better. Development of this immunity does not happen immediately. It takes about a week after the sickness starts for the body to create this immunity.



The I-2 vaccine works by stimulating the chicken to produce immunity. But the vaccine does not make the chicken sick.

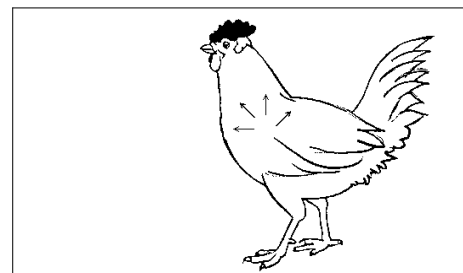


During a period of about one week after vaccination, the chicken develops a strong body defence against Newcastle disease.

One week



A vaccinated chicken does not get sick if the Newcastle disease virus attacks. It remains with a strong body defence for some months.



Immunity takes time to develop - about a week

The Newcastle disease vaccine does not create immunity immediately; it takes about a week after vaccination for the immunity to build up to its full strength. So if the chicken is already sick from Newcastle disease when it is vaccinated, it will die before its body has time to build up the immunity. The vaccine must be given **before** the chicken is attacked by Newcastle disease.

So now we can see why the vaccine is used for prevention of Newcastle disease. And we can see why it is of no use as a treatment for the disease.

- If the chicken is already sick from Newcastle disease on the day it is vaccinated, it will probably die.
- If Newcastle disease attacks the chicken at the time of vaccination or even a few days later, it will probably die.
- If Newcastle disease attacks the chicken a week or more after vaccination, it will probably not get sick.

Vaccination must be repeated every four months

We aim to vaccinate chickens every four months. There are two reasons for this.

First, the immunity in the chicken's body, created through vaccination, does not stay strong forever. It slowly weakens. After about four months, the chicken's defence mechanism starts to weaken, so it must be strengthened again by doing another vaccination.

The second reason is that after four months, a lot of small chickens which have never been vaccinated have been hatched and are growing up. They need to be vaccinated before the disease strikes.

So we vaccinate every four months. The months we choose for vaccination are March, July, and November.

The I-2 vaccine prevents Newcastle disease - not anything else

From our knowledge of vaccination of our children, we know that each vaccine is effective against just one disease. It does not protect against other diseases. The situation is similar with the I-2 Newcastle disease vaccine.

The I-2 Newcastle disease vaccine prevents only the one disease it is designed for, Newcastle disease. It is good at preventing Newcastle disease but it will not prevent or cure other diseases. Chickens which have been vaccinated against Newcastle disease can and do die of other diseases. The Newcastle disease vaccine cannot prevent that from happening.

The I-2 vaccine is safe

Newcastle disease vaccine is harmless. If chickens get sick or die after vaccination, the cause is not the vaccine; it is something else.

Newcastle disease vaccine is harmless. It does not affect the chicken nor does it alter the taste of the meat.

Meat from chickens which have been vaccinated is safe to eat, even if it is eaten immediately.

Newcastle disease vaccine has no effect on the eggs produced by chickens. They will hatch normally or, if eaten, they are safe to eat.

Never vaccinate sick chickens

Vaccination must not be done on chickens that are sick. It must be done on healthy chickens before any disease has appeared in the village. Why?

If chickens are sick when they are vaccinated, the vaccine will not work well. The reason is simple. If the body of the chicken is weak when it is vaccinated, the immunity is also weak.

So we see that if sick chickens are vaccinated, they will probably die anyway when Newcastle disease strikes. If that happens, the owner will often believe the vaccine killed the chickens and will blame the vaccinator for the deaths. The owner may refuse to vaccinate in future. His/her chickens will be left unprotected. He/she may even try to persuade neighbours that vaccination is not effective. This is not good. It erodes confidence in the vaccine which can be so useful if it is used correctly.

For all these reasons, never give in to pressure from a distraught chicken owner to vaccinate chickens which are sick. Vaccinate only strong healthy chickens.

Section 3: How to prepare for a vaccination campaign

It is essential that we prepare for each vaccination campaign in the villages where we intend to work. Careful preparation ensures that farmers know what is going to happen and when. It also helps us to plan our work.

Preparation for a vaccination campaign involves informing and educating chicken owners about vaccination and gathering information on the number of chickens so that the right amount of vaccine can be obtained.

Education and publicity

A few weeks before the date of the vaccination campaign, you should visit every village where you intend to vaccinate and inform the community of the date of the event. You need to explain the importance of vaccination and you should attempt to answer any questions which chicken owners might have. You should clearly inform the community of the proposed date for vaccination and the cost of vaccinating each chicken.

It is not necessary for the whole community to know all of the information in this manual. However, all community members should understand the following:

What farmers need to know

1. Newcastle disease is a very important disease which can be prevented by vaccination with the I-2 vaccine. Vaccination should be done every four months.
2. There is no effective treatment for Newcastle disease. Once it comes, chickens will die in large numbers unless they have been vaccinated beforehand.
3. Vaccination does not cure Newcastle disease. It prevents the disease before it comes by creating immunity in the chicken.
4. Vaccination does not take effect immediately. It starts preventing the disease about one week after vaccination and continues to protect the chicken for about four months.
5. Owners should not wait until Newcastle disease threatens. If Newcastle disease comes, vaccinating at that time cannot save them. They will die in large numbers unless they were vaccinated at least one week before the disease appears in the village.
6. As a Community Based Vaccinator, you cannot and will not vaccinate sick chickens. If chickens are sick, their body is weak, the vaccine cannot work in a weak body, and then the chickens will die. If that happens, you are likely to be held responsible. Therefore point out now that you will refuse to vaccinate chickens which are weak or sick.
7. Every owner should vaccinate all of their chickens, large and small, even day-olds. If they vaccinate only some chickens, the others may die of Newcastle disease.

If possible, you should place a notice in a suitable place advising the community of the planned vaccination campaign. A sample notice is shown in Appendix 3. Be sure to fill in the boxes which show the target village, date of vaccination and the price.

Registration

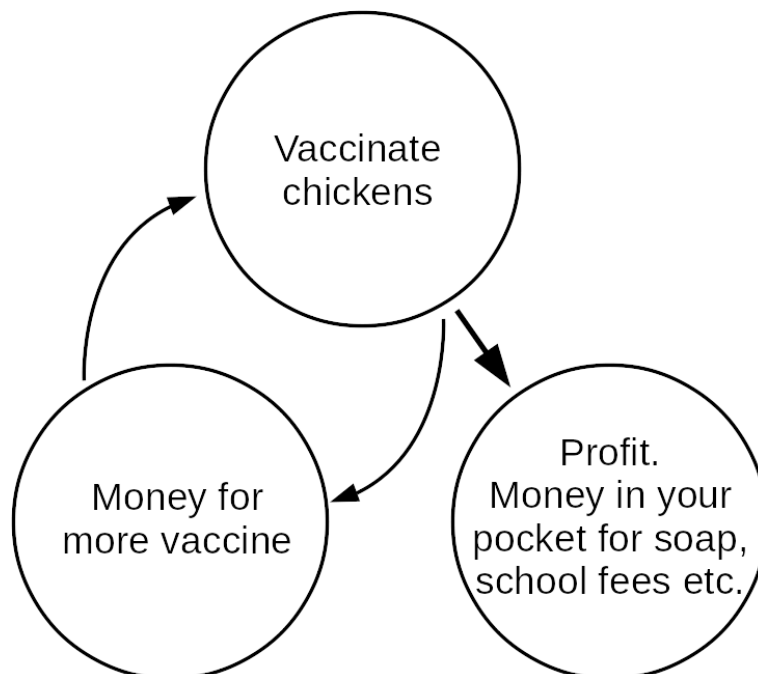
Every Community Based Vaccinator will need to know how much vaccine to procure in order to vaccinate the chickens in their area. So the first thing to know is how many chickens are going to be vaccinated. In order to do that, you should ask everyone in the village how many chickens they have and how many they intend to vaccinate. This information should be written down in a book as in the example shown in Appendix 1. You will fill in only the first three columns for now.

After completing this for the whole target area, you can add up the numbers and make an estimate of the total number of chickens that will be vaccinated.

Every vial of vaccine holds about 300 drops. But all vaccinators lose a few drops because they often have to give a second drop to make sure the chicken is properly vaccinated. Therefore, we will assume that each vial is sufficient to vaccinate about 250 chickens.

So now we can estimate how many vials of vaccine we should order. For every 250 chickens, we will need one vial of vaccine.

Planning for rural vaccination - business aspects



Every Community Based Vaccinator will need to know how to plan for business sustainability of the vaccination programs. Vaccinating chickens can be a profitable business. You will need to know how to calculate profit. Here is how:

Income:

Number of chickens vaccinated A	X	Price charged per chicken B	=	Total money received C
---	---	---------------------------------------	---	----------------------------------

Costs:

Cost of vaccine D	+	Other costs eg transport E	=	Total costs F
-----------------------------	---	--------------------------------------	---	-------------------------

Profit:

Money left for you: G	=	Total money received C	-	Total costs F
---------------------------------	---	----------------------------------	---	-------------------------

An example (and more for practice):

A	Number of chickens vaccinated	250			
B	Price charged per chicken	K40			
C	The total money you receive	K10,000			
D	Cost of vaccine	K3,000			
E	Other costs eg transport	K500			
F	Total costs	K3,500			
G	Profit - money left for you (C - F)	K6,500			

How much time is required?

Most experienced Community Based Vaccinators can vaccinate 300 chickens in one or two days. But that's not full days because the chickens need to be vaccinated early before they have been let out. So basically, the profit of K6,500 in our example requires about two short days of work. What other activities give that much for two short days of work?

Keep enough money to buy more vaccine

It is very important for the Community Based Vaccinator to keep aside the money for the cost of the vaccine. This money must be available when required.

No money:	no vaccine
No vaccine:	no vaccination
No vaccination:	no profit
No vaccination:	lots of dead chickens
No vaccination:	unhappy farmers

Chicken owners must pay

It is also very important that chicken owners do actually pay for the vaccine. If they do not pay, Community Based Vaccinators will lose their profit. They will lose interest in continuing their work and lots of chickens will not be protected from Newcastle disease.

In communities where non-payment is a problem, local leaders (such as GVHs) should be asked to assist by pointing out to poultry farmers that failure to pay threatens the continuation of the whole vaccination program in their communities. Local leaders should therefore understand what the vaccine does and why vaccination is important. Wherever possible, they should attend training sessions and meetings about progress of vaccination programs in their areas.

Forming groups

There are good reasons for Community Based Vaccinators to organise themselves into groups, often based on the closest Extension Planning Area office. In groups, vaccinators can discuss and solve local problems, they can

pool resources to buy vaccine, they can meet with government or NGO staff to seek assistance, and plan and coordinate their activities. So how do they organise a group?

Each group should organise an initial meeting of all members of the group. This meeting should adopt a constitution which provides for election of a Chairperson, a Secretary and a Treasurer. In case of sickness, there should also be a Deputy Chair and a Deputy Secretary.

The Group should also nominate a trustworthy and reliable person who, at the appropriate time, can collect money from members for the purpose of going and purchasing vaccine on behalf of all vaccinators who wish to buy vaccine. In the next section, we will show how this practice can save significantly on the cost of vaccine.

The group should meet every month. It is good to fix one day of the month for the meeting so that people don't forget or get confused about the date. All members should attend unless there are extenuating circumstances. Some groups include in their constitution by-laws to ensure attendance.

Purchasing vaccine

The I-2 Newcastle disease vaccine can be purchased at the Central Veterinary Laboratory in Lilongwe. Currently, the price of one vial (300 doses) is K1,100. Most Community Based Vaccinators will need just one or two vials to vaccinate the chickens in their area. Going to Lilongwe to purchase just one or two vials can be very expensive due to the costs of transport. However, in a group, we can pool resources to save on the cost of transport. Let us use an example to illustrate this. In our example, we will compare two different scenarios:

- an individual going from Mchinji to Lilongwe to purchase 2 vials;
- an individual going to buy a total of 15 vials on behalf of a group of 10 vaccinators.

We've also included a blank column for practice.

Item	Individual 2 vials	Group Rep 15 vials	Your example
Cost of transport MC-LL-MC	8,000	8,000	
Cost of local transport in LL	1,000	1,000	
Cost of food for the journey	1,500	1,500	
Cost of vaccine at CVL	2,200	16,5000	
Total money required	12,700	27,000	
Number of vials bought	2	15	
Total Cost per vial	6,350	1,800	

We can see from this example why cooperation pays. If an individual goes to Lilongwe for just two vials, the total cost including transport is K6,350 per vial. If a group sends one person to collect 15 vials, the cost is K1,800 per vial.

Of course, there are also private suppliers, for instance in Kamwendo or Mchinji, who charge K3,000 - K4,000 per vial. You can purchase from these suppliers too.

Whenever and wherever you buy vaccine, you should always check two things:

- Check the expiry date to ensure the vaccine will be okay when you want to use it;
- Check that the seal on the lid of the bottle is intact. If it is broken, do not buy the vaccine.

Section 4: About the I-2 Newcastle disease vaccine

We have already seen that there are several different types of Newcastle disease vaccine. Here, we are learning about the I-2 vaccine which is available in Malawi and which is well suited for use in village chickens.

How to keep the I-2 vaccine

There are some simple rules which you should always follow:

- Always keep the vaccine cool.
- Keep the vaccine in the fridge.
- Never let the vaccine freeze. It should be cool, not frozen.
- Never leave the vaccine in the sun, not even for a short time.
- When you take the vaccine out of the fridge, use it within 3 days.

How to transport the I-2 vaccine

This diagram shows a good type of basket for carrying I-2 vaccine in the field. The vaccine is wrapped in a wet cloth which is inside the basket.

The open weave basket allows air to flow through and cool the wet cloth. This keeps the vaccine cool.



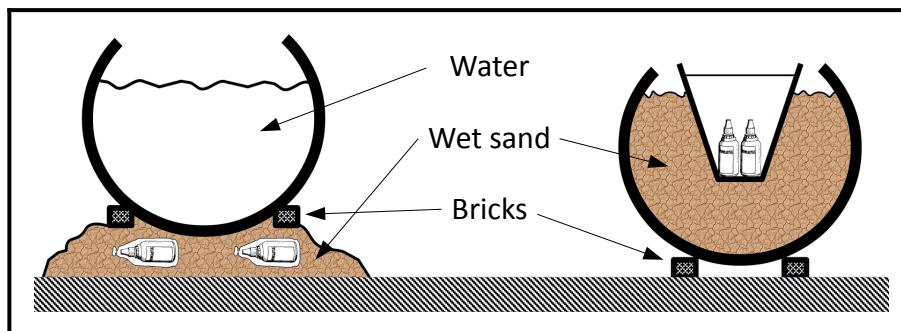
If the vaccine is being transported from one place to be stored in a refrigerator, a commercial cooler box should be used. The vaccine should be carried with ice to keep it cool inside the box.

How to make a village fridge

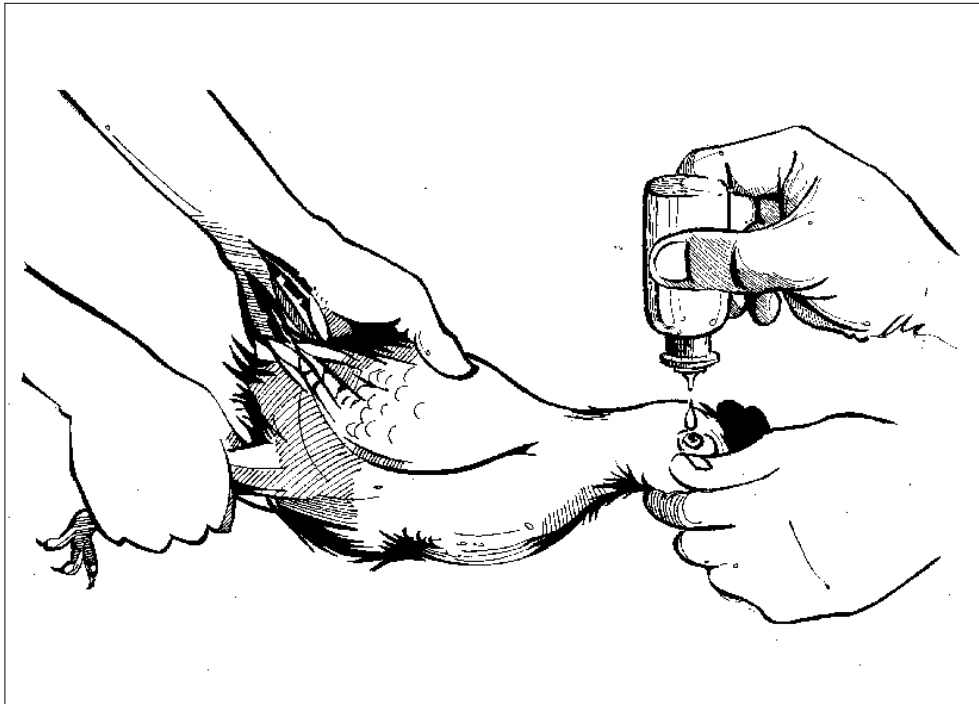
Community Based Vaccinators should keep vaccine in a cool place, like a fridge, at all times. In the village however, refrigeration is usually absent. So we are going to learn how to make a low-cost and improvised "village fridge" using locally available resources. You will need:

- A shady place indoors, where there is room for air to circulate;
- A clay pot that has never been used for cooking and which water can slowly seep through;
- Bricks or stones to support the pot;
- Sand and water.

We show here two ways we can use these to keep vaccine cool. These work best on hot dry days - not so well in the wet season. The circulating air causes water to evaporate from the pot or from the sand and thus cool the area where we have placed the vaccine. Here is a 'cut-away' diagram showing our two designs:



How to use the I-2 vaccine



Choose a **shady area** to do the vaccinations.

Every chicken in the flock should be vaccinated. Even day-old chicks should be vaccinated.

First shake the bottle. Then one drop of the vaccine should be dropped into the eye of the chicken. Hold the bottle vertically as shown in the picture. If you do not hold it vertically, you may waste drops of vaccine. Do not let the bottle touch the eye or skin of the chicken. The bottle must stay perfectly clean. It should be held about 2-3 cm from the eye.

It is best for the owner to hold the legs and wings of the chicken but for you to hold the head as shown in the diagram. That way, you can hold the head still and accurately apply a drop in the eye.

This is done on just one eye, not both. However, if more than one drop is given, it will not harm the chicken.

Record the vaccination in your book as in the example shown in Appendix 1.

Each vial contains about 300 drops. Sometimes a drop is wasted so one vial can be used to vaccinate about 250 chickens. But if the vaccinator is very careful not to waste drops, 300 chickens can be vaccinated from one vial.

Do not congregate lots of chickens from distant villages. Some of those chickens may be carrying diseases. If you congregate chickens from lots of villages, you might allow diseases to spread from sick chickens to other healthy chickens when they meet. Therefore, vaccinate all the chickens in one village, wash your hands with soap, then move on to the next village.

Every owner should be informed at the time of vaccination that protection of the chicken will start about one week after vaccination and will last about four months.

Owners should also be reminded that the vaccine is harmless. There is no problem if people wish to slaughter chickens which have just been vaccinated. There is no problem if people wish to eat eggs from chickens which have just been vaccinated.

Dispose of used bottles carefully

Never forget to dispose of used bottles properly. Why is this necessary? Well we know from experience that some unscrupulous people refill used bottles with water and deceive farmers. If this happens in your area, chickens will not be vaccinated and will die when Newcastle disease strikes. Then farmers in your area will lose confidence in your vaccination activities. Therefore please always ensure that used bottles are disposed of in the pit latrine or by burning.

Section 5: Some questions from chicken owners and suggested answers

You as Community Based Vaccinators will be among the first people who are approached by chicken owners for information about Newcastle disease vaccination. There are several common questions which are often heard. Often, farmers do not remember to vaccinate their chickens until Newcastle disease has already struck. Then they want help. At other times, farmers do not have money to pay for the vaccine and want assistance for free. At other times, they think something has gone wrong after the chickens have been vaccinated.

Section 5: Questions and answers

Below, we have supplied some helpful tips to answer some of the common questions which farmers raise.

1. Thank you for vaccinating my chickens today. Are they safe now?

Suggested response:

They are not protected just yet. They will be protected in about one week. The vaccine works on their body to build up immunity. But it takes about a week before the immunity is strong. Then they will be protected for about four months. If Newcastle disease comes during that time, they will not die. Please be ready to vaccinate all your chickens again, even the baby chickens, in about four months.

2. My chickens are dying of Newcastle disease. How can you help me?

There is no way for me or anyone to stop the disease at this time. There is no treatment for Newcastle disease. You can only wait till it passes and in future vaccinate your chickens to protect them before the disease returns.

3. But my chickens are dying. Can't you vaccinate them to stop the deaths?

Newcastle disease vaccine cannot be used for treatment of chickens that are already sick or dying. The vaccine will have no effect in stopping the disease once it has entered the village. The vaccine can only be given to healthy chickens before they are attacked by Newcastle disease. There is no treatment for Newcastle disease. Once the disease has entered a village, many of the chickens will die.

4. Why do you refuse to vaccinate my chickens which are a bit sick?

Your chickens are sick. Their bodies are weak. If I vaccinate them, the immunity produced by the vaccine will be weak. They will not be protected against Newcastle disease. If Newcastle disease comes to the village, they will die even if they were vaccinated. A strong healthy chicken produces a strong body immunity through vaccination. I can only vaccinate strong healthy chickens.

5. I have no money. I can't pay for vaccination. What can I do?

If you have ten chickens, you can sell one and that will give you enough money to vaccinate all the others. If you don't vaccinate, the disease can kill all your chickens. You must decide whether it is better to have nine live chickens or risk having ten dead chickens.

6. The vaccine killed my chickens. They died just after being vaccinated.

The vaccine is harmless. It cannot kill chickens. It cannot harm chickens. The vaccine takes at least one week to protect the chicken. If your chickens died just after being vaccinated, they may have been attacked by the Newcastle disease virus before the vaccine had time to build up its protection. Alternatively, they may have died of some other cause.

7. The vaccine didn't work on my chickens. They died a few weeks after being vaccinated.

The vaccine works very well. It protects chickens from Newcastle disease. The protection develops about a week after vaccination and lasts about four months. If they died a few weeks after vaccination, the cause of death was something else, not Newcastle disease. The vaccine does not protect against other diseases; it only protects against Newcastle disease. Vaccinated chickens may die of other diseases and the vaccine cannot prevent that.

Newcastle disease vaccination record form

Vaccinator's name: _____

Date: _____

Name of owner	Village	Total No of chickens owned	No of chickens vaccinated	Amount paid
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
17)				
18)				

Newcastle disease vaccination reporting form*

Name of vaccinator: _____

Date(s) of vaccination: _____

Number of bottles at start of vaccination: _____

Number of bottles left after vaccination: _____

Village	No of chickens present	No vaccinated
Total:		

* When you finish vaccination, please send a copy of this form to the government Assistant Veterinary Officer or the Agricultural Extension Development Officer responsible for your area.

BEWARE OF
Newcastle disease



**VACCINATE YOUR CHICKENS TO
PREVENT NEWCASTLE DISEASE**

Vaccine against Newcastle disease will be available at:

Village:	
Date:	
Price per chicken:	

THANK YOU

Monthly work plan

January	February	March	April
May	June	July	August
September	October	November	December
Register chickens. Order vaccine.	Vaccine available in the village. Sensitisation.	Vaccinate chickens.	Follow up on vaccination. Records.