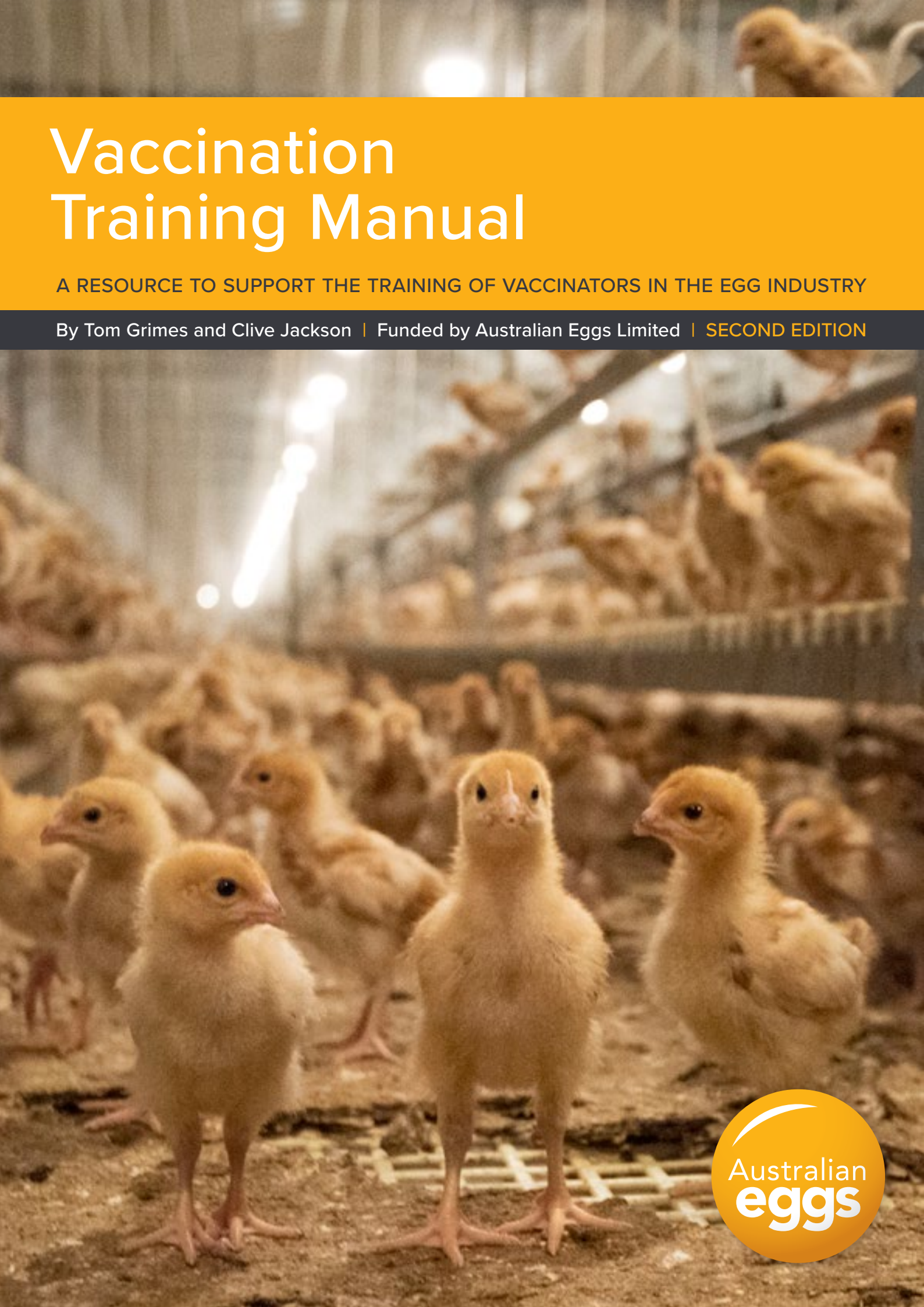
Vaccination Training Manual

A RESOURCE TO SUPPORT THE TRAINING OF VACCINATORS IN THE EGG INDUSTRY

By Tom Grimes and Clive Jackson | Funded by Australian Eggs Limited | SECOND EDITION



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Vaccination Training Manual – Edition 2

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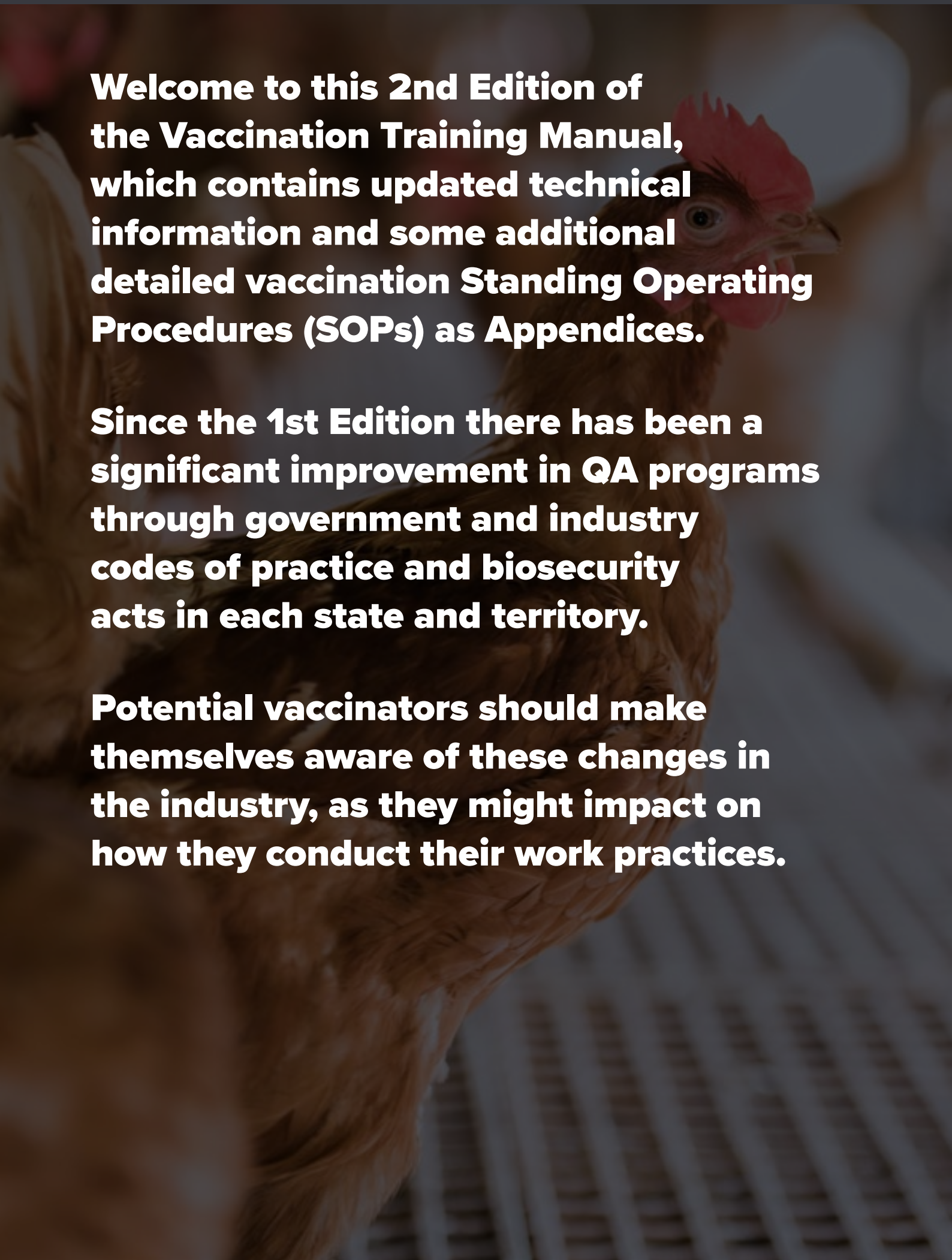


Welcome to this 2nd Edition of the Vaccination Training Manual, which contains updated technical information and some additional detailed vaccination Standing Operating Procedures (SOPs) as Appendices.

Since the 1st Edition there has been a significant improvement in QA programs through government and industry codes of practice and biosecurity acts in each state and territory.

Potential vaccinators should make themselves aware of these changes in the industry, as they might impact on how they conduct their work practices.

Introduction

The manual will help you to gain the necessary skills, knowledge and attitudes to become a competent vaccinator. Competent vaccinators are essential for the egg industry, as vaccination is effective only if it is carried out according to the manufacturer's instructions. To do this you must receive, transport, store, prepare and administer vaccines correctly so that an effective dose is applied to each bird.

Vaccination improves bird health and welfare, and maximises egg production by preventing infectious disease outbreaks. It allows farm managers to prevent, rather than try to cure, disease. This is an essential part of ensuring the viability of individual farms and the egg industry as a whole.

Training

To become a skilled vaccinator you must be able to vaccinate according to egg industry standards. This involves being able to:

1. conform to biosecurity requirements
2. receive, transport and store vaccines correctly
3. handle birds to be vaccinated
4. prepare to vaccinate birds
5. administer a vaccine to birds
6. complete vaccination procedures.

Your training will most likely occur on the job. Your team leader, farm manager or instructor will provide training opportunities for you to learn and practise the skills needed to vaccinate birds. You should discuss with them how your training will take place, and what will be expected from you.

It is important to observe experienced vaccinators carefully so that you pick up the 'tricks of the trade' – those skills that make the job easier and more accurate.

Assessment

Assessment will determine whether you have reached the standard required to vaccinate chickens. You will be assessed in the workplace if you wish to have your vaccination skills recognised. Assessment is not compulsory.

Assessment is competency based. This means that you are assessed to see whether you can do the job to the required standard. If you can, then you are 'competent'. If you can't, then you are 'not yet competent' and require further training.

Your assessor will require you to provide evidence of your ability. This may include watching you perform tasks, asking you questions, talking to your team leader or looking at photos or videos of you working.

Assessment is nothing to be scared of. If you can do your job well, then assessment just confirms this. Make sure you can meet the required standards by working through the self- assessment in *Appendix A*.

1.0 BACKGROUND

This manual is a resource to help you reach the standards required of a vaccinator in the egg industry.

Chapter 1 contains general information, and Chapters 2 to 7 describe issues you need to be aware of and skills you need to become proficient at.

Optional activities are shown at the end of each chapter.

1.1 What is Vaccination?

Vaccination is the process of introducing a vaccine into an animal. It is used by the egg industry to control a range of diseases that have the potential to cause illness or to reduce the number of eggs laid.

Vaccination is used extensively to prevent infectious diseases on an egg farm. Because large numbers of birds are kept close to one another, infectious diseases can spread rapidly. For the egg industry, therefore, prevention of disease is always better than cure.

1.2 What is a Vaccine?

A vaccine is a veterinary product used to increase the birds' immunity to an infectious disease. Vaccines can include live or killed (sometimes called inactivated) disease organisms or even just specific parts of these organisms. Micro-organisms such as viruses, bacteria, protozoa and mycoplasmas are used to make vaccines.

A vaccine is not a medicine that fights disease. It allows the bird's own body to stop the disease taking hold. This is called immunity, and is the natural way that the body deals with disease.

Common vaccines used in the egg industry are listed in *Appendix B*.

1.3 Types of Vaccines

Vaccines are divided into two types – live and killed. Both types cause a bird to develop immunity to the disease from which the vaccines are made.

Live vaccines contain a mild strain of the disease organism or one that has been modified to reduce its ability to cause disease. These are sometimes called attenuated vaccines. Non-attenuated or virulent vaccines can also be used if they are given at a time when they won't cause significant disease.

Killed (or inactivated) vaccines contain dead disease organisms. These cannot cause disease but are still able to cause birds to develop immunity.

For some diseases, live vaccines are used for "priming" the bird's immune system prior to boosting the immunity with killed vaccine, or in some cases by administration of another live vaccine.

The supply and use of some vaccines are prohibited by state and territory legislation. Locally manufactured vaccines require permits from State Chief Veterinarians and the Australian Pesticides and Veterinary Medicines Authority (APVMA), or require registration from APVMA before they can be used. Imported vaccines require registration, testing and approval for use from Australian Government import authorities and APVMA.

1.4 Why are Birds Vaccinated?

Birds are vaccinated to boost the immune system. Vaccines prime the body's defences to be ready to act when a bird becomes infected, and so minimise infection or completely stop the disease from taking hold. The immunity boost is specific to a particular disease organism, and so vaccinations must be given for each disease that the bird is being protected against.

1.5 When are Vaccinations Given?

Vaccinations are generally given early in a bird's life. Laying hens usually receive a number of vaccinations up to the point of lay. The first vaccinations are given in the hatchery, then at other stages of the rearing period as required.

Birds are sometimes re-vaccinated when they are older (e.g., during lay or during moulting).

Revaccination boosts immunity and helps to ensure that infectious disease occurrence is minimised.

The age of the birds when vaccinated is critical for most vaccines to work effectively. Giving the vaccine when the birds are too old or too young can cause vaccine reactions, health problems, or reduce the vaccine's effectiveness. This effectiveness is often referred to as 'safety and efficacy'.

Do not vaccinate flocks while they are exhibiting clinical signs of disease.

1.6 Where are Birds Vaccinated?

Birds may sometimes be vaccinated before they hatch as embryos of about 18 days of incubation. Birds are first vaccinated in the hatchery in their holding boxes, in cabinets, or individually while being held. Pullets are then vaccinated in their rearing sheds while adult birds are vaccinated in litter barns, sheds with cages and free range sheds.

Vaccinations are given by hatchery staff, vaccinating contractors, farm staff and veterinarians.

1.7 Methods of Vaccination

There are seven main methods used to vaccinate birds. These are via:

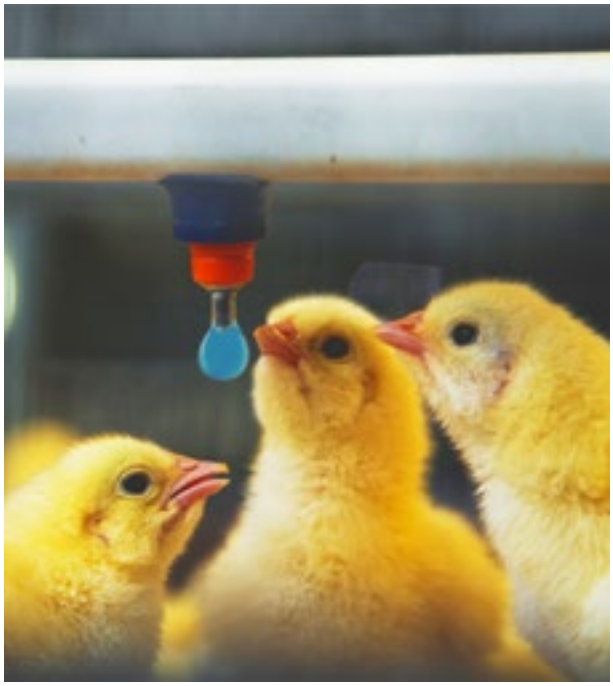
- drinking water
- sprays (coarse droplet sprays), mainly in the hatchery
- drops or squirts (eye, nasal)
- scarification (of the wing web, comb or thigh) or 'wing-web stab'
- injection (intramuscular or subcutaneous)
- the egg ('in ovo') in the hatchery
- gel droplet spray in the hatchery.

The method chosen depends on the age of the bird, the cost of the vaccination, the vaccine being used, and on veterinary advice. See *Chapter 6* for further details.

1.8 Testing Vaccine Efficacy

How do you know if a vaccination has worked? Unfortunately, there are usually no visible signs that the vaccine has actually generated an adequate immune response. An exception would be the response to Fowl Pox vaccination. After Pox vaccination, a pustule or scab should form a few days afterwards, indicating a successful "take" of the vaccine. Also, if a blue dye is added to a vaccine,

'In ovo' vaccination



Water based vaccine in drinker line

a strong blue colouration of the tongue or the crop of young chicks can confirm that the spray, eye drop or drinking water vaccine administration has been successful.

The most common method to confirm vaccination efficacy for some vaccines is to test the serum antibody levels generated by the vaccine agent, by taking a blood sample and sending it to a diagnostic laboratory. Veterinary advice is often required for the interpretation of the results.

2.0 BIOSECURITY

Biosecurity prevents the spread of infectious disease

This chapter will help you to conform to farm biosecurity requirements.

It describes how to:

- follow farm biosecurity procedures
- communicate clearly with others
- maintain your personal biosecurity
- clean and sanitise equipment and vehicles
- plan a daily routine to minimise biosecurity risks.

2.1 Biosecurity for Vaccinators

Biosecurity is the system used on an egg farm, rearing farm or in a hatchery to prevent and control the introduction of infectious diseases. The aim is to stop the introduction of infectious diseases to birds, and prevent the spread of diseases from infected areas to uninfected areas.

Biosecurity involves:

- establishing quarantine areas, such as with a perimeter fence
- personal hygiene, including wearing clean clothes and footwear, and hand washing
- not having any contact with disease-carrying animals or birds at home or elsewhere, particularly in the case of people who have recently travelled overseas and been in contact with poultry or poultry premises, that have the potential to carry diseases capable of infecting poultry
- ensuring that vehicles and equipment are cleaned and sanitised before moving on or off the farm
- secure disposal of farm waste, litter and birds off-farm.

Biosecurity is especially important for vaccinators that regularly move from farm to farm. This movement has the potential to transmit disease unless biosecurity guidelines are followed.

The level of biosecurity varies from farm to farm. Some farms will be very strict, whereas others may not. Many farms have their own biosecurity plans or have adopted industry-wide plans such as those based upon the National Farm Biosecurity Technical Manual for Egg Production. Everyone on a vaccination team has a part to play in maintaining biosecurity, regardless of a farm's procedures. Staff should not visit flocks if they have respiratory symptoms or diarrhoea.

PPE should be worn to boost biosecurity

Note: *The Biosecurity Code of Practice* and the *National Farm Biosecurity Technical Manual for Egg Production* can be downloaded from Australian Eggs Ltd website.

2.1 SUMMARY

FOLLOW FARM BIOSECURITY PROCEDURES

- ✓ **Follow farm quarantine rules.**
- ✓ **Maintain your personal hygiene.**
- ✓ **Keep away from animals or birds that might carry diseases capable of infecting poultry.**
- ✓ **Declare to your employer if you think you have breached any of the rules.**
- ✓ **Ensure all equipment and vehicles are cleaned and sanitised.**

2.2 Vaccination and Biosecurity

Vaccination and biosecurity are the two main weapons farm managers have to prevent infectious disease. Both can be effective individually but work even better when combined.

Biosecurity is intended to keep infectious diseases out of a farm so that birds remain healthy. Vaccination provides insurance when biosecurity fails and birds are exposed to an infectious disease. A good way to think of this is to see biosecurity as the first line of defence and vaccination as the second.

It is important to remember that even though you might be vaccinating birds against one infectious disease, you could also be passing on another infectious disease or even organisms in the vaccine if you do not follow biosecurity rules.

2.2 SUMMARY

BIOSECURITY AND VACCINATION

- ✓ **Biosecurity and vaccination work better together than individually.**
- ✓ **Biosecurity is the first line of defence.**
- ✓ **Vaccination is the second line of defence.**

2.3 The Importance of Communication

Vaccination teams

Vaccination teams contact the farm manager before starting the job. An experienced team leader will confirm the:

- location of the farm
- biosecurity procedures at the farm
- person to contact on arrival at the farm
- vaccine to be used and its location
- quantity and age of birds to be vaccinated
- sheds and order of vaccination
- type of housing and methods of bird restraint
- method of vaccination to be used
- issues specific to the farm being visited.

It is a good idea to write down any instructions so that they are clear. This ensures that there are no misunderstandings and that changes can be made if required. Regular communication should be maintained during the job and a report provided after the job is complete. This lets farm managers know about any problems and will help them to better manage their birds.

Farm employees

Communication is just as important for farm employees carrying out vaccinations. Employees need to talk with their supervisors so that they are clear about what they need to do and how they should do it. They should be trained in biosecurity to prevent inadvertent spread of disease.

2.3 SUMMARY

COMMUNICATE CLEARLY

- ✓ **Obtain clear instructions before vaccinating.**
- ✓ **Write down instructions.**
- ✓ **Note and report any problems during and after the vaccination.**

2.4 Personal Biosecurity

Some diseases that affect poultry can easily be spread by human contact. Because of this it is very important that vaccinators make sure they do not do things that will increase the risk of picking up or carrying a disease that affects poultry. Disease can be carried on boots, clothes, hair and skin. As part of a vaccination team you should:

- maintain your personal hygiene
- sign a Personal Quarantine Declaration when required
- follow the local biosecurity rules of the farm you are working on
- use farm-dedicated clothing and footwear where possible
- change into clean clothes and footwear or over-boots, before and after each vaccination job
- wash hands on entry and after leaving the premises
- minimise contact with ducks, geese, emus, ostriches, pet birds and pigeons, and with pigs
- NOT keep domestic birds or pigs at home
- NOT take animals with you when you visit a farm.

The team should sign the visitors' book when arriving at and leaving the farm, and should keep a diary of visits. This provides a trail that can be investigated in the case of a disease outbreak. Biosecurity requirements will increase on farms with serious disease outbreaks.

Personal biosecurity is just as important for farm employees who vaccinate birds.

2.4 SUMMARY

MAINTAIN YOUR PERSONAL BIOSECURITY

- ✓ **Maintain personal hygiene.**
- ✓ **Follow farm biosecurity procedures.**
- ✓ **Minimise contact with other poultry/birds and pigs.**

2.5 Cleaning and Sanitising

Between jobs it is essential to clean and sanitise all equipment associated with vaccination. This is part of biosecurity, and helps to ensure that the vaccination team does not spread infectious disease from one farm to another.

Cleaning and sanitising are both necessary. Cleaning is the removal of dirt from a surface, but it does not kill germs and bacteria. Sanitising (sometimes called disinfecting) involves killing the bacteria and other organisms left on a surface. Boiling equipment in water can also assist.

Wherever possible, try to avoid bringing equipment on to a farm, and use whatever is on the farm as much as possible.

A typical routine used to clean and sanitise is:

Vehicles

Sweep or vacuum the inside of the vehicle to remove any dirt and dust – particularly from floor mats. Insects (especially flies) can also carry disease. When cleaning vehicles try to remove any insects that may have been picked up on the farm. Wash the inside and outside with a sanitiser to kill any germs. Pay particular attention to cleaning the tyres.

Equipment

Brush off any loose dirt and dust from equipment, nets, surrounds and tools. Pull equipment apart if necessary, and clean it to ensure that all dirt is removed. Sanitise all equipment to kill germs. Boil equipment that will withstand high temperatures. Ensure all traces of sanitiser are removed from equipment that comes into direct contact with live vaccines.

Seek advice about the most appropriate products used to clean and sanitise. The directions on the label of any chemical product used must always be read and followed. Consult your supplier if you are unsure about any recommendations, and make sure you familiarise yourself with the Safety Data Sheet (SDS) for any chemical product you use. Killed vaccines can be harmful to humans if injected.

2.5 SUMMARY

CLEAN AND SANITISE EQUIPMENT AND VEHICLES

- ✓ **Remove dirt.**
- ✓ **Kill germs.**
- ✓ **Remove all traces of sanitiser from equipment.**
- ✓ **Minimise the transporting of insects from one property to another.**
- ✓ **Read the label on all chemicals used, and follow the directions.**
- ✓ **Familiarise yourself with the SDSs.**

2.6 Planning a Daily Routine

Vaccination teams

- As part of a vaccination team you should plan a job so that you:
- allow 48 hours between farm visits – avoid doing jobs more frequently unless permission has been provided by the farm's technical adviser
- don't visit farms for seven days after visits to overseas poultry facilities – seek medical attention if feeling ill within seven days of returning from overseas
- wear clean clothes and boots for each job
- use a complete change of clothing and footwear or over-boots between jobs

Staff wearing personal protective equipment

park vehicles outside the farm perimeter distant from the sheds in specified quarantine areas.

When you visit a farm you should always contact farm staff before entering and follow the farm's biosecurity rules. Use designated parking and change areas where these are available. Portable footbaths and hand washing facilities may be provided and should be used where required. Dispose of over-boots in appropriate bins.

Farm employees

As a farm employee, you should follow similar rules, making sure that vaccination is scheduled so that it is not interrupted by other tasks.

2.6 SUMMARY

PLAN A DAILY ROUTINE

- ✓ **Visit only one farm within a 48 hour period, unless permission is granted when special biosecurity procedures are undertaken.**
- ✓ **Wear clean clothes and boots or over-boots on each job.**
- ✓ **Park vehicles outside the farm perimeter in designated quarantine areas.**

2.7 Self-Assessment Activities

1. **Find out the biosecurity procedures your vaccination team follows:**
   a. before going to a new farm
   b. when entering the farm premises
   c. during the work day
   d. when leaving the farm each day
   e. when leaving the farm before going to the next farm.
2. **Check your home/personal situation. Do you:**
   a. keep birds at home?
   b. come into contact with wild or domestic birds?
   c. come into contact with pigs?
   d. have family or household members who have contact with pigs, birds or poultry farms?
   e. make sure that you have not visited other farms in Australia for 48 hours, unless permission is granted when special biosecurity procedures are undertaken?
   f. make sure that you have not visited farms or other contaminated premises overseas in the last 7 days?
3. **What should you do if you answered 'yes' to any of the prompts in activity 2?**
4. **If you do not follow biosecurity rules, what could happen to:**
   a. the birds on the farms you visit?
   b. you?
   c. the business you work for?

3.0 RECEIPT, TRANSPORT AND STORAGE

Receive, transport and store vaccines according to the manufacturer's instructions.

This chapter will help you manage the receipt, transport and storage of vaccines correctly.

It describes how to:

- maintain the vaccine's potency
- minimise contamination
- keep yourself safe.

3.1 Importance of Correct Receipt, Transport, Storage and Handling

Correct receipt, transport, storage and handling are essential if vaccines are to be effective. Follow the manufacturer's instructions at all times; if you don't, the vaccine may lose potency and will then not be effective at preventing disease.

Some general rules to keep in mind are to:

- ensure the vaccine company has a farm delivery address where the vaccine can be transferred into appropriate storage shortly after delivery
- check the storage temperatures required for the different classes of vaccine
- check the vaccine containers immediately on arrival to confirm that the correct vaccines have been delivered, and to ensure the vaccine is cool (for killed vaccines), totally frozen (for example Mycoplasma and Avian Encephalomyelitis vaccines), or not frozen (for example killed vaccines and coccidiosis vaccines), as appropriate
- check the number of days taken for delivery to make sure the vaccine has not been held up in transit in unsatisfactory conditions
- record the number of vaccine vials/bottles and diluents, batch numbers, and expiry dates
- keep the vaccine in an insulated container with ice or a frozen brick when moving it from the refrigerator to the place of use except in the case of killed vaccines, which should be at "room temperature" when injected
- reconstitute the vaccine away from direct sunlight
- keep reconstituted vaccine cool and away from light – use the vaccine as soon as possible once it is reconstituted.

Your role is to follow instructions and look for situations that could damage the vaccine. The main things to monitor are:

- **Temperature:** Keep the vaccine within the desired temperature range. Don't overheat or re-freeze.
- **Time:** Use within the suggested time once reconstituted. Don't use old vaccine. Check the expiry date.
- **Contamination:** Transport and store the vaccine according to the manufacturer's instructions. Don't allow the vaccine to become contaminated. Discard diluent if it changes colour.
- **Records:** Keep a record of the number of vials, doses and diluents that were used.

Make sure you consider your own safety when transporting and handling vaccines. You should familiarise yourself with the Safety Data Sheets (SDSs) for the vaccines you deal with, as they provide important safety information.

3.1 SUMMARY

FOLLOW MANUFACTURER'S INSTRUCTIONS

- ✓ **Check the vaccine on receipt.**
- ✓ **Keep the vaccine within the desired temperature range.**
- ✓ **Avoid leaving vaccines in the sun.**
- ✓ **Use within the suggested time once reconstituted.**
- ✓ **Minimise contamination of the vaccine.**
- ✓ **Familiarise yourself with SDSs.**

3.2 Transporting Vaccines

Transporting vaccines correctly involves keeping the vaccine within the temperature range set by the manufacturer. This varies depending on the type of vaccine. For example, some vaccines are stored at -20°C in a freezer, whereas others can be kept 4°C to 8°C in a refrigerator. It is important to store vaccines

at the recommended temperature so that they remain active. Freezing killed or coccidiosis vaccines will destroy their potency. Diluents accompanying some vaccines should be stored at the correct temperature.

Many vaccines are transported in insulated containers, such as an esky containing ice, a frozen brick, or dry ice, or in liquid nitrogen. You should be able to maintain the required temperature for the time it takes to transport the vaccine from the refrigerator to the place of use – whichever system is used. Avoid spillages of vaccine or liquid nitrogen and having physical contact with liquid nitrogen, as it will cause frostbite on skin.

Problems can occur if there are delays getting to the farm where the vaccinations will be done. The vaccines may thaw or reach unacceptable temperatures. If you are delayed it may be worth stopping for more ice – especially on a hot summer's day.

It is important to monitor the temperature of the container, as it can be difficult to notice any deterioration in the vaccine. This is especially the case with freeze-dried products, which may show no sign of damage.

3.2 SUMMARY

USE A SUITABLE CONTAINER TO TRANSPORT VACCINES

- ✓ **Select an insulated container.**
- ✓ **Keep the vaccine at the correct temperature by using ice, a frozen brick or liquid nitrogen, depending on the type of vaccine.**
- ✓ **Killed vaccines should be injected at "room" temperature (15-25oC).**
- ✓ **Monitor the temperature of the container.**

3.3 Storing Vaccines and Diluents

Vaccines can represent a substantial investment by the farm, not only in the cost of the vaccines themselves but also the cost of a disease outbreak if vaccination is not successful. Therefore, proper storage and regular monitoring of the condition of the vaccines are good ways to protect this investment.

Vaccines are usually kept at the correct temperature by placing them in a fridge (4-8°C) or chest freezer (-20°C). These temperatures should be checked every time vaccine is removed or at least every three months.

Refrigerators and freezers used for storing vaccines should be alarmed so that a responsible staff member can take corrective action immediately if the alarm is activated.

Refrigerators and freezers used for vaccine storage should not be used for general farm use, as constant opening and closing of the doors can increase internal temperatures to unacceptable levels.

Freezers should not be auto-defrost as these raise internal temperature on a cyclical basis, which may damage vaccine.

Some vaccines require more specialised storage to ensure maximum survival of the cells in the vaccine. Liquid nitrogen (-196°C) is used for some vaccines, whereas dry ice or low-temperature chest freezers (-70°C) are used for long-term storage of Mycoplasma gallisepticum (MG) and Mycoplasma synoviae (MS) vaccines. MG and MS vaccines can be stored at -20°C in chest freezers that do not auto-defrost for four weeks before use.

Vaccines are usually supplied as:

- freeze-dried vaccines – kept in a freezer.
- glycerol-stabilised and frozen vaccines, such as AE and Mycoplasma (called MG and MS) – kept in a chest freezer; not in an auto-defrosting freezer, as thawing and refreezing will decrease or destroy their potency. Deep frozen vaccines such as Marek's Disease vaccines – kept in liquid nitrogen in the hatchery.
- inactivated (killed) and coccidiosis vaccines – kept in the fridge, but never frozen. Don't store these vaccines adjacent to the freezing compartment or the cooling element of a refrigerator.

Vaccine Storage	
Refrigerator	**Freezer**
Inactivated Newcastle Disease (ND)	Live V4 ND
	Infectious Bronchitis (IB)
Inactivated Egg Drop Syndrome (EDS)	Infectious Laryngotracheitis (ILT)
Inactivated ND + EDS	
Inactivated Cholera	Avian Encephalomyelitis (AE)
Inactivated Coryza	*Mycoplasma gallisepticum* (MG)
Inactivated Egg Drop Syndrome (EDS)	*Mycoplasma synoviae* (MS)
Inactivated ND + EDS	Fowl Pox (FP)
Inactivated Cholera	Live Cholera
Inactivated Coryza	Live *Salmonella* Typhimurium

Vaccines must be stored away from light, as even short exposure to sunlight can lower their potency enough to make them ineffective. Every vaccine has an expiry date and should be used before this date. The potency of the vaccine may drop to unacceptable levels beyond the expiry date, making the vaccine ineffective. Hence stock rotation of vaccines in storage is important.

Check the packaging of stored vaccines to ensure that it is intact. Make sure that the rubber stoppers used to seal vaccine vials are intact, and that vacuum packs have not been punctured.

3.3 SUMMARY

STORE VACCINES AS DIRECTED

- ✓ **Follow the manufacturer's instructions.**
- ✓ **Alarm storage freezers and refrigerators.**
- ✓ **Keep all vaccines away from light.**
- ✓ **Check packaging for damage.**
- ✓ **Observe expiry dates.**

3.4 SELF-ASSESSMENT ACTIVITIES

1. **Watch an experienced vaccinator transport and store vaccines. Ask questions to make sure you know why they are carrying out their actions.**
2. **Select a poultry vaccine you are familiar with. Check the manufacturer's instructions regarding:**
   a. **how it should be transported**
   b. **how it should be stored.**
3. **What can happen to the potency of a vaccine if the manufacturer's instructions are not followed?**
4. **Would you use a vaccine that is past its expiry date? Why, or why not?**
5. **Familiarise yourself with where to find relevant information on the SDS for the vaccine you are using.**

Vaccine stored in freezer – soonest expiry on top

4.0 HANDLING BIRDS

A good stockperson minimises stress on the bird.

This chapter will help you to handle birds for individual vaccination.

It describes how to:

- minimise stress to birds
- recognise normal and abnormal bird behaviour
- pen birds for vaccination
- catch birds for vaccination.

4.1 Stock-handling Skills

Good stock-handling skills are essential for vaccinating individual birds. A good stock attendant is fully aware of the wellbeing of the birds they are working with. They aim to maximise the welfare of the birds at all times.

Birds are easily injured if they are not handled correctly. Correct handling involves smooth, unhurried movements that minimise stress to the birds. Never rush any handling activity, as this can cause bone breakages. Caring for the birds' wellbeing is more important than speed.

People have different ideas about how birds should be handled. Because of this the 4th Edition of the *Model Code of Practice for the Welfare of Animals Domestic Poultry** was written to tell people throughout the poultry industry how birds are to be handled.

The welfare code emphasises the importance of good stockpersonship in maximising animal welfare. It suggests that 'persons responsible for the care of poultry should be well trained, experienced and dedicated'. You should attempt to achieve and maintain this description.

4.1 SUMMARY

MINIMISE STRESS TO BIRDS DURING ALL ACTIVITIES

- ✓ **Handle birds according to the Welfare Code of Practice.**
- ✓ **Do not rush handling activities.**
- ✓ **Use smooth, unhurried movements.**

4.2 Bird Behaviour

An important part of being a good stockperson is the ability to identify both normal and abnormal behaviour. You must be able to detect problems by the way the birds are behaving in hatcheries or on farms. This is made more difficult by the great variability among sheds – even among sheds with the same types of birds.

It is vital that you assess the flock before, during and after vaccinating. You should be constantly using all your senses to pick up any changes from normal. When a change is detected you will need to find out what the problem is and fix it where possible.

Normal behaviour during vaccinating in sheds includes birds being noisy and flighty. They will naturally group together for safety and try to escape from the catchers. Birds normally return to feeding and drinking shortly after vaccinating.

Abnormal behaviour can vary greatly and includes the birds being extra noisy or extra flighty, panicking, packing into shed corners, shivering, not eating and drinking, or being very quiet. These behaviours are all signs of stress.

A particular behaviour to look for is packing of birds into corners, where they can quickly suffocate. Always be alert for this behaviour and regularly walk to corners to check during vaccination activities; postpone vaccination if the problem cannot be overcome.

* The *Model Code of Practice for the Welfare of Animals (Domestic Poultry)* is available from CSIRO Publications, PO Box 89, East Melbourne, Victoria 3002; or The Australian Government Publishing Service, GPO Box 84, Canberra, ACT 2601; or www.affa.gov.au.

4.2 SUMMARY

RECOGNISE NORMAL AND ABNORMAL BIRD BEHAVIOUR

- ✓ **Monitor bird behaviour at all times.**
- ✓ **Watch and listen carefully.**
- ✓ **Make sure birds do not pack into shed corners.**
- ✓ **Try to find the cause of abnormal behaviour and fix it if possible.**
- ✓ **It may be necessary to postpone vaccination if a serious problem can't be fixed.**
- ✓ **If in doubt always inform your supervisor.**

4.3 Penning Birds

Birds housed on the ground need to be penned if they are to be vaccinated individually. When birds are herded into a pen they can be caught easily. Some common handling techniques when penning birds include:

Chicks

Chicks in hatcheries are usually held in plastic boxes with holes to supply air. The boxes should not be tilted or jolted, as this scares the chicks. Day-old chicks need to be kept warm. The temperature in the chick holding room should be around 25°C.

1- to 3-week-old birds

Because birds at this age will often panic, they should be left in their brooding surrounds wherever possible. Dim or blue light during penning helps the birds to remain calm.

4- to 14-week-old birds

Birds should be herded into the pen quietly without any rushing. Do not keep them in the confined space of a pen for more than 15 minutes so that they don't overheat. If wire pens are used, cover the wire with hessian as this reduces the risk of birds packing into corners.

The most important thing is never to overcrowd a pen. A good stock attendant will constantly check for suffocation and overheating and adjust the number of birds in the pen to ensure that this does not happen.

Your farm manager or team leader will usually make decisions about the position and size of pens. These will vary according to the age of the birds, the weather and the number of catchers, and will change throughout the day as the team works through the flock.

Pens and other barriers should be set up to minimise the time required for the job and thus reduce bird stress. The vaccination site should be close to the catching pen so that bird-handling time is reduced. Choose a stable position on level, dry litter or concrete. Always avoid wet patches of litter.

If necessary, manually adjust ventilation rates in consultation with the farm manager to lower dust and overheating. Never make adjustments to ventilation without the full involvement of the farm manager.

4.3 SUMMARY

PEN BIRDS BEFORE VACCINATION

- ✓ **Avoid overcrowding, overheating and suffocation.**
- ✓ **Use smooth, unhurried movements.**
- ✓ **Reduce light intensity where possible to keep birds calm.**

4.4 Catching Birds

Birds need to be caught for individual vaccinations. Catching is sometimes referred to as 'pickup'.
To minimise stress, you should always use smooth, unhurried movements and avoid making loud noises when catching birds. Birds will naturally try to escape, so it is important that you keep a firm hold at all times.

Catching methods vary according to the birds' age. You may also need to adjust your technique, depending on how the bird is housed and the flightiness of the birds.

Catching chicks

Day-old chicks can be scooped up with both hands. Be careful that chicks do not spill from the sides of

your hands. Older chicks are scooped into a basket held on an angle.

Catching pullets

Smoothly reach into the pen and pick up a manageable number of birds. Refer to the Code of Practice for details on the number of birds that can be carried. Make sure that you support the birds correctly before you pass them, one at a time, to the vaccinator or the 'walker' (a walker is the person who carries the bird from the catcher to the vaccinator.)

When you are catching from a cage, use one hand to grasp the bird's legs. This loosens its grip on the cage floor, allowing you to gently pull it feet-first from the cage. Your other hand should be used to provide extra support to stop the bird from flapping its wings and being caught on the door.

Correct handling will minimise the chances of breaking bones. Regardless of the bird's age, **never**:

- handle the bird roughly
- lift the bird by the neck, head, wing or tail
- use crates that are not suitable for holding birds
- tilt a crate with birds in it.

4.4 SUMMARY

CATCH BIRDS FOR VACCINATION

- ✓ **Handle birds correctly to avoid injury and minimise stress.**
- ✓ **Use smooth, unhurried movements.**

4.5 Self-Assessment Activities

1. **Practise your observation skills. Make sure you can work out the difference between normal and abnormal behaviour.**
2. **Practice penning and catching birds under various circumstances. Concentrate on minimising stress and injuries to the birds. Remember that different-aged birds require different techniques. If necessary, get advice from your team leader or farm manager**

5.0 PREPARING TO VACCINATE

Effective vaccination depends on careful preparation.

This chapter will help you to prepare to vaccinate.

It describes how to:

- calculate the amount of vaccine needed
- prepare vaccines for use
- maintain and calibrate equipment
- set up the work area

Note: *Concentrate on the sections that discuss the vaccination techniques you use.*

5.1 Calculations

For vaccination to be effective, it is important to calculate the correct amount of vaccine needed for the flock. It is critical to know the exact number of birds as this determines how many doses of vaccine you will need.

For drinking water administration, all birds should have access to water containing vaccine for around 1.5-2 hours. If the time is less, not all birds will obtain a full dose of vaccine and if the time is much longer, the vaccine may die before it is consumed. Estimate how much water the birds will drink in 2 hours by using drinking water tables or by measuring how much water the birds drink at the same time of the day for 1-3 days previously. Allow for "dead" spaces at the bottom of medication tanks.

Always work from the manufacturer's recommendation unless specific instructions have been received from a veterinarian to do otherwise. Vaccine is provided in a range of dose sizes and volumes. For example, live viral vaccines may come in dose sizes ranging from 500 to 10,000 doses in a vial. Diluents may also come in a range of volumes. You might be asked to calculate the total amount of vaccine required, a dilution, or individual doses. For example:

- to inject 0.2 mL of vaccine per bird from a 1000 dose vial add 200 mL of diluent (i.e. 1000 x 0.2 mL = 200 mL)
- to water vaccinate 20,000 birds use 4 vials of 5000 doses per vial in the water (i.e. 20,000 birds/5000 doses = 4 vials).

Proper dilution of the vaccine is essential. Always read the manufacturer's instructions thoroughly so that you understand how the vaccine should be prepared. You should also check for updates, as changes to instructions are sometimes made. Use measuring containers with accurate markings that can be read easily. These containers should not be used for any other purpose.

You must be able to interpret the instructions and apply them to the birds you have to vaccinate. This means doing some maths – preferably on paper so that you or someone else can check your calculations. Remember that one simple mistake can mean that the vaccination will not be effective or that an overdose may be given.

Work through the maths with an experienced vaccinator so that you are sure of your calculations. Check your calculations regularly, especially when you are working with new vaccines.

Always make sure that you have enough vaccine to finish the job before you start.

5.1 SUMMARY

CALCULATE THE AMOUNT OF VACCINE AND WATER OR DILUENT NEEDED

- ✓ **Read instructions carefully.**
- ✓ **Be accurate with your calculations.**
- ✓ **Have someone check your calculations**

5.2 Reconstituting Vaccines for Use

Check and record the vaccine type, batch number and expiry date of the vaccine. Check the same details for the diluent if supplied.

Vaccines can be easily contaminated by small amounts of dirt or chemicals. Live vaccines, especially, are susceptible to disinfectants, chlorinated water, and other sanitisers commonly used on farms. Avoid exposing the vaccines that you use to these chemicals by:

- washing your hands and ensuring the soap is thoroughly rinsed off
- mixing in a clean area and on a clean surface that has been thoroughly rinsed to ensure that traces of disinfectant do not contaminate the vaccine during mixing with water

- using new clean needles and containers.

The damaging effects of chlorinated water can be overcome by adding 2 to 2.5 grams of skim milk powder or blue stabiliser powder/tablets to each litre of water. Stabiliser preparations are recommended as they also stabilise the pH of the water and leave less residue in drinker lines during water vaccination procedures.

Stabiliser powder/tablets or skim milk powder can also protect vaccines if the water has some mineral or organic matter contamination. Unless you are sure that you are using high quality, fresh clean water you should add stabiliser powder/tablets or skim milk powder as a precaution. Blue stabiliser powder/tablets or skim milk powder are also useful as visual markers to see where the vaccine is in the drinker lines.

When mixing, always add the vaccine to water, not water to the vaccine. This will avoid the vaccine being splashed out of the vials or containers. You should also ensure that all vaccine concentrate is removed from storage vials by rinsing them into the vaccine mixture.

Further details on reconstituting vaccines can be found in Appendix D.

5.2 SUMMARY

PREPARE THE VACCINE CAREFULLY

- ✓ **Follow the manufacturer's directions.**
- ✓ **Check the vaccine for expiry date.**
- ✓ **Do not allow dirt or chemicals to contaminate the vaccine.**
- ✓ **Add blue stabiliser powder/tablets or skim milk powder to water unless it is fresh, clean and unchlorinated.**
- ✓ **Dissolve, mix and dilute the vaccine concentrate accurately.**
- ✓ **Add vaccine to water – not water to vaccine.**

5.3 Maintenance and Calibration of Equipment

Vaccination equipment should be serviced and cleaned before each job. This includes:

- thoroughly dismantling, cleaning and sanitising all equipment to remove dirt
- servicing injecting equipment (vaccination guns) on a regular basis, and replacing 'o' rings if they are showing signs of wear or damage
- thoroughly rinsing sanitised equipment that will come in contact with the vaccine
- checking the equipment works correctly – vaccination equipment, catching gear, and anything operated by electricity should be checked
- arranging for an electrician to check electrical cords and safety switches (also called earth trips) every six months, as an extra safety precaution (as required by OH & S regulations)
- checking the equipment is calibrated, as this is especially important for equipment that must deliver a set dose of vaccine to each bird (e.g. to test the volume of injections given by automated syringe, squirt at least 10 shots into a small measuring cylinder) – normal wear and tear or even air locks can change the settings, so that some birds may receive too much or too little vaccine – note that calibration is also important for the equipment that sprays aerosol vaccines
- preparing backup equipment, as breakages and failures will sometimes occur, and making sure you have the necessary replacement equipment so that you can get around any problems quickly – depending on the vaccination technique used, backup equipment should include extra needles, syringes, plastic tubing, mixing ladles, nozzles, ice, and plastic buckets.

5.3 SUMMARY

MAINTAIN VACCINATION EQUIPMENT

- ✓ **Clean, sanitise and rinse all equipment.**
- ✓ **Check all equipment on a regular basis.**
- ✓ **Calibrate equipment.**
- ✓ **Prepare backup equipment.**

5.4 Preparing to Vaccinate Birds through the Water System

Preparation to vaccinate using drinking water involves thoroughly cleaning the header tanks, drinker lines or troughs with a sanitiser, such as citric acid, to remove algae and slime at least one day prior to vaccination. Be careful to fully flush the system with fresh water if a sanitiser is used, as vaccine may be killed if any sanitiser is left in the lines.

Remember to flush tanks thoroughly as there may be a dead space in the bottom of a medication tank. This can only be overcome with high volumes of water to remove all traces of sanitiser.

Cleansing the drinking lines with skim or low-fat milk powder solution the day before vaccination will help to reduce the effect of chemicals in the drinking line. Add milk powder at 2.5 g/L to the medication tank and flush it through the drinking lines, making sure that the milky solution reaches the ends of the lines. Blue stabiliser powder/tablets are increasingly used instead of milk powder.

It is also important to calculate how much water the birds are drinking, before using the milk powder. This is done by measuring the volume of water consumed from the medication tank over a two-hour period, preferably in the early morning. Do this for 1-3 days before the vaccination, and make sure that NO disinfectants or chemicals are used in the drinking system during this period.

It is good practice to carry out a mock vaccination using only water for new sheds or for birds of different age groups. This will allow you to deal with any potential problems, such as air locks in drinker lines, other blockages, and breakdown of pumps. Try to complete the mock vaccination within two hours.

Before vaccinating, birds can be taken off water for up to two hours so that they are mildly thirsty at vaccination time. This avoids having birds that have just had a drink just before vaccine is administered. These birds may not drink for another two hours, thus missing out on vaccination.

When vaccinating, ensure vaccine is flushed immediately to end of the line (milk powder or blue stabiliser powder/dye assists detecting this) before birds are allowed to drink. Lift drinkers if possible while filling the line with vaccine, then drop drinkers so that all birds start drinking at the same time. Don't use water sanitisers for at least one day following vaccine administration.

5.4 SUMMARY

FOR VACCINATION USING DRINKING WATER

- ✓ **Clean the water system.**
- ✓ **Flush the system with clean water or milk powder solution or blue stabiliser powder/ tablets.**
- ✓ **Calculate water consumption.**
- ✓ **Conduct a mock vaccination.**

5.5 Preparing to Vaccinate Birds by Spray Administration

Preparation for a spray vaccination involves:

- ensuring that hatchery sprayers are operated according to manufacturer's instructions
- preparing the shed – adjust the ventilation system so that movement is minimised, and reduce light levels
- obtaining and checking personal protective equipment (PPE) for the operator – operators must wear PPE that is appropriate for the vaccine being used; this usually involves respirators and eye cover to avoid exposure to sprayed vaccine mixture
- checking the spray equipment, including nozzles and operating pressure, as any problems can greatly alter the amount of vaccine each bird receives
- carrying out a mock vaccination – this uses a spray output of water to accurately measure and adjust the variables of time, pressure, and operator movement around the shed
- Keeping the lighting level down low so that birds don't continuously walk away from the vaccinator as they walk through the shed.

Make sure that the droplet size is appropriate for the vaccine being used. For example, infectious bronchitis and Newcastle Disease vaccines are sprayed with a large droplet size so that they do not enter the lower respiratory tract. In the hatchery, droplet size can be estimated by spraying vaccine on to paper in an empty chick box. Check chickens for vaccine cover by feeling how wet they are, or through the use of a dye in the diluent.

5.5 SUMMARY

FOR SPRAY VACCINATION

- ✓ Operate hatchery sprayers according to manufacturer's instructions.
- ✓ Reduce ventilation when spray vaccinating in a shed.
- ✓ Reduce light levels when vaccinating in a shed.
- ✓ Check personal protective equipment (PPE).
- ✓ Check spray equipment, including nozzles and pressure.
- ✓ Conduct a mock vaccination.
- ✓ Check vaccine cover.

5.6 Preparing to Vaccinate Birds Using Injections, Drops or Scarifiers

Preparation of syringes, vaccination guns, droppers and scarifiers involves cleaning and sterilising any non-disposable parts of the equipment (e.g. injection guns).

Dried vaccine can be removed from equipment by flushing in running water before boiling for 15 minutes in water. Do not use any chemicals or antiseptics on equipment used for live vaccines.

Make sure that a supply of disposable items such as needles and plastic tubes is available. There should be enough on hand to complete the job. Set up the work area so that there is adequate lighting, and to allow for operator comfort and efficient movement of people and birds.

Ensure that killed vaccines are at room temperature (but not over 25°C) prior to injection. Shake vigorously to ensure thorough mixing before and during administration. Killed vaccines cannot be damaged by over-vigorous shaking.

Dilute live fowl pox vaccine according to the manufacturer's instructions.

5.6 SUMMARY

FOR VACCINATIONS USING INJECTIONS, DROPPERS OR SCARIFIERS

- ✓ Clean and sterilise all non-disposable equipment.
- ✓ Set up the work area for comfort and efficiency.

5.7 Preparing to Vaccinate through the Egg

This type of vaccination is normally only conducted in commercial hatcheries and is supplied and serviced by the equipment manufacturer. Check the equipment used to deliver the 'in ovo' ('in the egg') dose of vaccine to fertilised eggs if you are involved. Equipment should be cleaned, sanitised and rinsed free of sanitiser before use.

Instructions from the manufacturer of the 'in ovo' injection equipment should be followed, as these provide detailed notes on setting up. See Chapter 6 for more details.

5.7 SUMMARY

FOR EGG VACCINATION

- ✓ Clean, sanitise and rinse all equipment.
- ✓ Set up the work area for efficiency and comfort.
- ✓ Follow manufacturer's instructions.

5.8 Self-Assessment Activities

1. Practise calculating the total amount of vaccine concentrate needed for a job and how much vaccine solution this will make up. Make sure you can adjust your calculations according to different-sized flocks.

2. Watch an experienced vaccinator reconstitute a vaccine. Practise this skill under supervision, paying special attention to diluting the concentrate.

3. Watch an experienced vaccinator maintain and calibrate their equipment. Practise these skills under supervision.

4. What other preparations should you make before administering the vaccine you use?

6.0 ADMINISTERING VACCINES

Correct administration of vaccines provides lasting protection to the health of birds.

This chapter will help you to administer vaccines.

It describes how to vaccinate using:

- drinking water
- sprays
- drops
- scarification
- injections
- the egg ('in ovo').

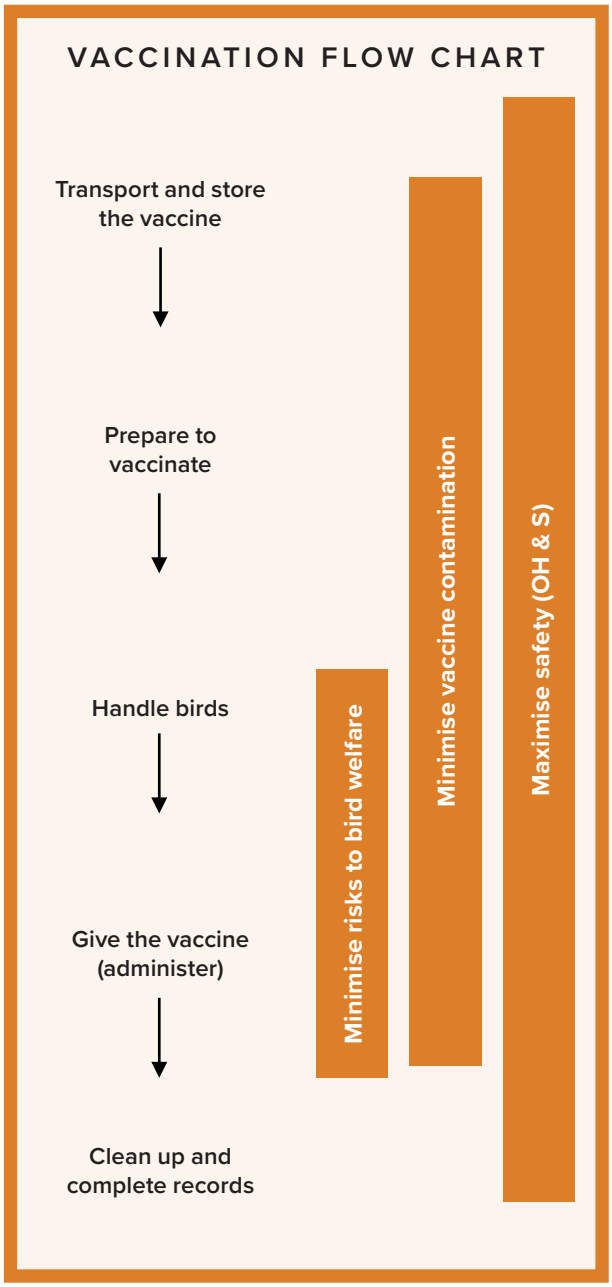
Note: *Concentrate on the sections that discuss the vaccination techniques you use.*

6.1 Vaccinating

Vaccination is often a repetitive task that requires everything to run smoothly if consistency is to be achieved. Consistency is essential and relies on vaccinators and bird handlers working together to make sure the vaccine is delivered successfully.

Vaccination methods vary according to veterinary advice, the farm manager's preference, number of birds, size of the vaccination team and the diseases being vaccinated against. Important work practices for all methods include:

- thorough preparation before vaccinating, i.e. reconstituting the vaccine, maintaining and calibrating equipment and adjusting environmental factors (see Chapter 5)
- handling birds correctly, i.e. during penning, catching and holding (see Chapter 4)
- ensuring that accurate and consistent doses are administered to the birds (see Chapters 3 and 5)
- following occupational health and safety (OH & S) guidelines, i.e. taking rest breaks, using personal protective equipment, and using well maintained vaccination equipment (see Chapters 5 and 6).



'Wing-web stab' vaccination

6.2 Routes of Vaccination

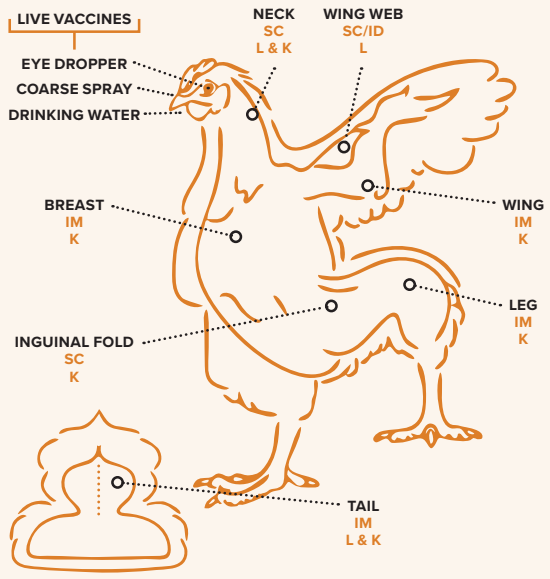
The common routes and sites of vaccination are shown in *Diagram 1*. Sites illustrated on the diagram include vaccination via drinking water, and injections in the neck, wing web, wing, breast, inguinal fold, leg and tail. The abbreviations used in Diagram 1 are:

L Live vaccine; **K** Killed vaccine;

SC Subcutaneous; **IM** Intra muscular

ID Intra dermal (alternative term for sub cutaneous)

DIAGRAM 1
ROUTE AND SITE OF BIRD VACCINATION



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6.3 Vaccination via Gravity-fed Drinking Water

Vaccination through the water system is used to vaccinate a flock without needing to handle individual birds. It should be carried out early in the morning whenever possible, with cool water used for vaccination. Check that all drinkers are working. The drinker system should be drained of water so that vaccine is not diluted when added. Vaccination can be delayed for 1-1.5 hours, depending on weather conditions, to ensure birds are thirsty when vaccinated. The nipple lines or bell drinkers should be raised above bird height when filling with water containing vaccine, to ensure all birds have equal access to vaccine when the lines or drinkers are lowered. Allow water to drain out of the end of nipple lines until milk powder or blue dye is seen, and then lower the drinker lines. Each bird should consume the required registered dose of vaccine within the vaccine administration period. If blue stabiliser powder/tablets are used, the tongues and crops of a sample of birds can be checked shortly after vaccine administration for consumption of vaccine, with blue tongues being found on at least 95% of birds.

The header tank should have been flushed with water during your preparation, to remove all dirt and organic debris. You should make sure the tank is filled with sufficient fresh cool water to last the birds for two hours. Add skim milk powder at 2 to 2.5 g/L or blue coloured stabiliser powder/tablets and mix thoroughly. Wait for 10 minutes before adding vaccine.

Turn off the water inlet tap, remove caps from vials, dissolve the vial contents and mix vaccine thoroughly under stabilised cool non-chlorinated water in a dedicated clean bucket. Vaccine clumping can be broken-up using a whisk. Then add the vaccine mixture to the header tank and stir thoroughly with a paddle or stirring pump. Allow the milky or coloured vaccine mixture to drain through the drinker system so that it is available to all the birds. Flushing the lines with water containing vaccine can be managed by observing that milky or blue water exits the end of each water line in the shed or fills every bell drinker when the lines and drinkers are raised. Walk through the shed just after vaccination to ensure that all birds drink the vaccine during the vaccination period and that the vaccine containing skim milk or blue dye reaches the ends of the lines.

The vaccine mixture should be consumed within two hours. Consumption of the vaccine can be confirmed by checking for blue staining on the bird's tongue if a

blue dye is included with the vaccine.

Do not supply clean water until all the vaccine mixture has been fully consumed.

Remember to turn the fresh water supply back on and check that all drinkers are working.

6.3 SUMMARY

VACCINATING USING A GRAVITY-FED DRINKER SYSTEM

- ✓ **Put correct amounts of vaccine, skim milk powder or blue stabiliser powder/tablets and cool water in the header tank after dissolving/mixing in a dedicated bucket. Check accuracy.**
- ✓ **Refill the drinker system evenly with vaccine mixture throughout the shed.**
- ✓ **Check that all birds are drinking during the two-hour vaccination period.**
- ✓ **Refill the drinker system with clean water after the vaccine is consumed.**

6.4 Vaccination via Direct Application into Drinkers

Vaccination by direct application into drinkers is much the same as application through the drinking system. It is a technique used to vaccinate small batches of birds where a manual drinker system is not automatically refilled with water from a header tank.

Water vaccination should be carried out early in the morning. Place the vaccine mixture into the drinkers and distribute evenly. Ensure that 2 hours water supply is available or keep replenishing the troughs until all the vaccine mixture is used up. For non-caged birds make sure the birds drink the vaccine mixture by quietly driving them gently towards the water troughs.

Total consumption of the vaccine should be completed within two hours. The birds must not be allowed access to any other water supply until all of the vaccine mixture has been consumed. Turn on the water taps following vaccination procedures and check that all drinkers are working.

6.4 SUMMARY

VACCINATE DIRECTLY INTO DRINKERS

- ✓ **Distribute the vaccine mixture evenly to the water troughs or drinkers. Check accuracy.**
- ✓ **Check that all birds are drinking over the two-hour vaccination period.**
- ✓ **Refill the drinkers with clean water after the vaccine is consumed.**

6.5 Water Vaccination using a Proportioner

Vaccination using proportioners (medicator or Dosatron) is often a more “user friendly” method of vaccinating in water. Most of the requirements above for effective water vaccination using gravity-fed or direct administration into drinkers apply. There are various types of proportioners that can dose at different rates so instructions specific to the proportioner type should be followed.

6.5 SUMMARY

VACCINATE IN WATER USING A PROPORTIONER

- ✓ **Arrange correct amounts of vaccine, skim milk powder or blue stabiliser powder/tablets and cool water for administering with the proportioner after dissolving/mixing vaccine in a dedicated bucket. Check accuracy.**
- ✓ **Refill the drinker system evenly with vaccine mixture throughout the shed.**
- ✓ **Check that all birds are drinking during the two-hour vaccination period.**
- ✓ **Refill the drinker system with clean water after the vaccine is consumed.**

6.6 Vaccination by Spray

Veterinary advice should be sought to manage spray vaccination using specific equipment to administer specific vaccines in the hatchery or in sheds, as the procedures that are required for this are very detailed.

Vaccination using a spray involves spraying the birds with vaccine mixture. This vaccination method is used mainly in hatcheries to administer the viral vaccines IB and ND and coccidiosis vaccines but can sometimes be used in sheds.

The droplet size of the spray varies according to the nozzles and the pressure used. Fine droplets, which can occur in aerosols and enter the birds' lower respiratory tract, should not be generated as these can be harmful to the bird, whereas larger ones in coarse sprays remain in the upper parts of the respiratory tract and are not harmful. The size of the droplets is important: too small and they produce severe reactions, too big and they are not effective. Always follow the manufacturer's instructions so that the droplet size is suitable for the vaccine being used.

When spray vaccinating birds in a shed the vaccination spray should be applied as evenly as possible by following a logical and systematic route through the shed. The spray should be aimed about one metre above the birds in a shed, whether you are vaccinating chicks in boxes, birds on the floor, or birds in cages. When spray vaccinating chicks in the hatchery, follow the administration instructions of the manufacturer of the sprayer or a veterinarian.

Your task is to apply vaccine on to the birds. Some will enter the eye, but most will be taken orally. Day-old birds will readily peck very small drops of water off each other and from the surfaces of the holding box.

Make sure the spray is not aimed at the birds in a shed directly. Successful application is marked by birds gently shaking their heads or snicking. Snicking is caused by the escape of air through the build-up of congestion in the nostrils or trachea. Chicks should not be taken from their boxes for at least 10 or 15 minutes after spraying.

Atmospheric conditions can markedly alter the quality of the spray application. The spraying time may need to be adjusted according to the humidity and temperature. More spray is used when humidity is low (because it evaporates), whereas less spray is required on very humid days.

6.6 SUMMARY

VACCINATE USING A SPRAY

- ✓ **Adhere to veterinary advice.**
- ✓ **Use the correct droplet size.**
- ✓ **Apply the spray evenly.**
- ✓ **Apply the spray one metre above the birds when sprayed in a shed.**
- ✓ **Adhere to the spray manufacturer's instructions.**
- ✓ **Adjust the amount of spray according to the humidity of the air.**
- ✓ **Maintain accuracy during application.**

6.7 Eye and Nasal Drop Vaccination

Eye drop vaccination involves placing a droplet of vaccine on the eyeball of each bird. A special dropper is used to deliver an accurate volume in each drop. Some vaccines are supplied with the dropper attached and are designed to deliver a specified volume of vaccine. If the vaccine needs to be diluted, ensure that the correct quantity of diluent is added to the vaccine to provide a full label dose of vaccine per bird.

Do not mix two different eye drop vaccines as this will dilute each vaccine by half. Do not give two eye drop vaccines into the same eye during a single vaccination procedure. The vaccine dropper must not touch the eye or eyeball. Always hold the dropper bottle inverted in a vertical position to ensure the correct droplet size and to avoid loss of vaccine.

It is important that the droplet spreads across the eyeball and does not run off the eye surface. This means that you must hold the bird on its side with the eye pointing upwards so that the drop does not roll off the eyeball. Each bird should be held until it blinks after the droplet is applied. The whole process must not be rushed, or it may not be successful.

The nasal drop vaccination method involves the chick being held with a finger blocking one nasal opening. The head is gently tilted backwards and a drop of vaccine placed in the other nostril. Again, it is important that the bird is held in such a way that the vaccine runs into the bird's nostril.

Some vaccines contain a dye to show that the bird has been correctly vaccinated. If not, add blue dye to the vaccine. The dye stains the bird's nostrils and tongue shortly after a correct vaccination which can be used to confirm correct administration.

6.7 SUMMARY

VACCINATE USING EYE OR NASAL DROPS

- ✓ **Hold the bird so that the vaccine does not roll off the eye or out of the nostril.**
- ✓ **Use the correct dropper.**
- ✓ **Ensure one drop contains one label dose of vaccine**
- ✓ **Do not rush the process.**
- ✓ **Maintain accuracy during application.**
- ✓ **Check to confirm that at birds have blue stained tongues shortly after vaccination.**

6.8 Skin and Feather Scarification

Skin scarification involves a scarifying needle being dipped into the vaccine mixture. The scarifying needle is then used to vaccinate the bird by puncturing the wing web (for chicks) or the comb (for older birds). The freeze-dried vaccine has to be dissolved and diluted, using a syringe to add diluent supplied by the vaccine company. The needle should deliver one dose of diluted vaccine per bird.

Be sure to re-dip the scarifying needle in the vaccine mixture before vaccinating each bird. Check the needle frequently to ensure its cleanliness and use a fresh tissue to clean it if necessary. Do not use disinfectants on dirty needles.

A critical aspect of vaccination using skin scarification is to make sure that the vaccine mixture is introduced into the skin tissue itself and not injected subcutaneously. It is also important that the vaccine mixture does not come into contact with the eyes or mouth of the bird, as it can cause lesions at these sites.

The feather-follicle method of vaccination involves administering the vaccine into the bird's feather follicles. Five or six feathers are carefully removed from the outside surface of the thigh (about 2 cm^2), and the vaccine is applied vigorously to the follicles by using a bristle brush dipped into the vaccine mixture.

The correct technique involves using a stiff bristle brush to force vaccine into the follicle. Make sure you remove the correct number of feathers and re-dip the brush for each bird.

Reconcile the number of birds vaccinated against the number of label doses in the vial to ensure that the applicator delivers a full dose of vaccine to each bird. The vaccination site can be checked for "pocks" around 7 days after vaccination to confirm effective administration.

6.8 SUMMARY

VACCINATE USING SKIN SCARIFICATION

- ✓ **Use the correct applicator and diluted vaccine quantity.**
- ✓ **Dip the scarifying needle into the vaccine mixture for each bird.**
- ✓ **Don't use disinfectants on dirty needles.**
- ✓ **Don't inject under the skin.**
- ✓ **Keep the vaccine mixture away from the bird's eyes or mouth.**

VACCINATE USING THE FEATHER FOLLICLE TECHNIQUE

- ✓ **Remove a patch of five or six feathers.**
- ✓ **Use a stiff brush to apply the vaccine.**

6.9 Vaccination by Intramuscular Injection

Intramuscular injections deliver vaccine mixture deep into a muscle. Three sites are used: the breast muscles, the thigh muscles and the tail muscle. The injection is made to a depth sufficient to place the vaccine in the middle of the muscle, for example in the fleshiest part of the breast.

Ensure that vaccination is carried out at room temperature (15-25°C). Shake vigorously to ensure thorough mixing before and during administration.

A 12.5 mm long 18-19 gauge needle attached to an automatic syringe, which should be calibrated before use each day, is commonly used. The length and diameter of the needle will vary according to the

age of the bird: smaller for younger birds, larger for older birds.

The needle should be changed if it is blunt, or at least every 1000 birds. Attachments for automatic syringes are available, which decontaminate needles between each bird and are useful in minimising the risk of cross-contamination and infection.

Reconcile the number of doses of vaccine against the number of birds vaccinated to ensure all birds received a full dose.

Operator safety is an important consideration with intramuscular injections. You need to be particularly careful to hold the bird firmly so that the needle penetrates the bird and not yourself. The vaccinator should wear protective gloves. Consult the Safety Data Sheet if self-injection occurs. Intramuscular injections into the breast are the easiest for inexperienced operators, but care needs to be taken to avoid hitting organs or entering the abdominal cavity.

6.9 SUMMARY

VACCINATE USING INTRAMUSCULAR INJECTIONS

- ✓ **Shake the vaccine vigorously to mix.**
- ✓ **Inject vaccine at room temperature (15-25°C).**
- ✓ **Inject into the breast, tail or thigh muscle.**
- ✓ **The injection should reach to the middle of the muscle.**
- ✓ **Change the needle regularly.**
- ✓ **Hold the bird securely.**
- ✓ **Maintain accuracy of application.**
- ✓ **Ensure staff are not injected.**

6.10 Vaccination by Subcutaneous Injection

Subcutaneous injections are given just under the skin. To do this you need to pinch a skin fold with your fingers so that the needle cannot penetrate into a muscle. The needle should penetrate one fold of skin only – never both sides of the skin fold.

Subcutaneous injections are usually given into the breast, the leg or the lower neck. Accuracy is critical, as incorrect placement of the needle can lead to the formation of lumps, lameness or head swelling, depending on the injection site.

Disposable sterile needles are used for subcutaneous injections. The needle should be changed on a regular basis and immediately if it becomes contaminated in any way. Changes are routinely made after 1000 birds.

Day-old chicks

Live Marek's Disease vaccines can be administered by this method. Day-old chicks are picked up from the box or conveyor belt by the vaccinator. The chick is held in the palm of the hand, and the thumb and index finger are used to raise a fold of skin over the neck. The needle on the automatic vaccinating gun is passed between the finger and thumb into a 'pouch' of skin and the injection made parallel to the neck. A swelling of vaccine can be felt under the skin.

If automatic injectors are used, the vaccinator places the chick into an entry slot. When the chick's head is detected by pressure, electrical or light sensors, an automatic injection is triggered. Excessive speed should be avoided to prevent missing the injection of any birds.

Older birds

Killed vaccines can be administered to older birds by this method. The bird is usually presented to the vaccinator in such a way as to enable a fold of skin over the neck to be lifted with the needle directed away from the head.

6.10 SUMMARY

VACCINATE USING SUBCUTANEOUS INJECTIONS

- ✓ **Pinch a fold of the bird's skin.**
- ✓ **Inject the vaccine mixture into the pouch that is formed.**
- ✓ **Change the needle regularly.**
- ✓ **Maintain accuracy of application.**
- ✓ **Ensure staff are not injected.**

6.11 Vaccination of the Egg

This type of vaccination is normally only conducted in commercial hatcheries. Vaccine can be injected into fertile eggs during day 18 of incubation. This is sometimes called an 'in-ovo' vaccination and occurs with the eggs in their filler trays.

The eggs can be vaccinated as they pass through an automated machine or manually by a vaccinator. For both the set-up and the vaccination procedure, refer to the manufacturer's and veterinary instructions for advice on this specialised vaccination method.

6.11 SUMMARY

VACCINATION OF THE EGG ('IN OVO')

- ✓ **Follow manufacturer's recommendations.**
- ✓ **Vaccinate on the recommended day of incubation.**

6.12 Occupational Health and Safety Issues

Operator comfort is essential to achieving a quality job when vaccinating individual birds or using aerosols. Some operators sit and some stand. This choice depends on the birds to be vaccinated and your personal preference.

Your ability to do a good job depends not only on your position, but also the temperature, ventilation, air quality, use of rest breaks, and the handling methods used. You may need to decrease your vaccination rate at times to maintain quality.

Do not be tempted to keep vaccinating if you cannot maintain quality. Excessive vaccination time can lead to repetitive strain injuries.

Team leaders constantly monitor the quality of the vaccination and increase rest breaks when conditions are poor. Maximum concentration must be maintained to ensure a proper job. Team leaders also make sure the team complies with Occupational Health and Safety (OH & S) legislation.

The air that vaccinators breathe is sometimes poor, with high dust levels and the smell of ammonia. Adequate ventilation and fresh air are important to reduce operator discomfort and aid in the prevention of fatigue.

Vaccinators should wear masks or respirators to prevent respiratory problems developing. They should also wear eye cover to avoid exposure to vaccines used as sprays, particularly when using Newcastle Disease vaccine. The virus has on rare occasions caused conjunctivitis in humans.

Avoid injecting vaccine mixture into your or the catcher's skin, wear protective gloves when injecting killed vaccines and dispose of used needles into a needle disposal container. Refer to the relevant SDS in case of accidental injection or contact with vaccine.

6.12 SUMMARY

CHOOSE A COMFORTABLE POSITION WHEN VACCINATING

- ✓ **Select a position that minimises fatigue.**
- ✓ **Wear appropriate personal protective equipment (PPE).**
- ✓ **Maximise the safety of yourself and others.**
- ✓ **Take regular rest breaks to maintain quality.**
- ✓ **Refer to SDSs if necessary.**

6.13 Self-Assessment Activities

1. **Watch experienced vaccinators at work. Ask them to show you how they vaccinate, using step-by-step actions so that you can see what they do.**
2. **What safety considerations should you be aware of when vaccinating?**

Preparing for subcutaneous injection

7.0 COMPLETE VACCINATION PROCEDURES

Finish the job properly.

This chapter will help you to complete vaccination procedures.

It describes how to:

- clean up
- check birds
- cull birds
- keep records.

7.1 Clean-up

Vaccination equipment can spread vaccine and disease organisms from farm to farm. Once the vaccination is complete it is important to clean up thoroughly. All equipment such as used vials, scarifying equipment, needles, buckets, measuring cylinders, and protective clothing should be sprayed with disinfectant before being removed from the shed.

Put disposable equipment into a rubbish bin unless you are advised otherwise on the vaccine label. Make sure any sharp objects, such as needles or scarifying equipment, are made safe by first putting them into a suitable hard-sided sharps disposal container.

Non-disposable equipment should be washed, sanitised and allowed to dry. Get advice before using chemicals, as any residue may deactivate the next vaccine you mix. Measuring containers and buckets should be labelled and stored away so that they are not used for other purposes.

Personal protective equipment (PPE) such as overalls, face masks, gloves and boots should be washed and allowed to dry. These items should be washed separately from other clothes. Where farm or footwear is supplied it should be left on farm

7.1 SUMMARY

CLEAN UP AFTER THE VACCINATION

- ✓ Remove all items from the shed after disinfection.
- ✓ Put disposable items into appropriate bins.
- ✓ Wash and sanitise non-disposable items.
- ✓ Clean all PPE used.

7.2 Checking Birds

When the vaccination team is working in the shed they are responsible for the birds' welfare. The team works together so that problems are minimised and the birds' behaviour is returned to normal after the job.

It is especially important that someone in the team watches the birds after they are vaccinated to see if their behaviour is normal. Stop vaccinating and check what is going wrong if the birds show any signs of undue stress (e.g. flightiness or inactivity). Things to check for include injuries, smothering, bleeding at the site of injection, and any reactions to the vaccine.

Birds on the floor will naturally pack together in response to the activity in the shed. One team member should be watching this at all times and should spread the birds, if necessary, to stop smothering. This is especially important towards the end of vaccinating.

Some live bacterial vaccines contain a low level of endotoxin that can cause birds to collapse temporarily or become depressed. These birds will recover but the event should be reported to the farmer or farm manager.

The final thing to check is that birds are given water and feed quickly so that stress is minimised. This is the responsibility of the farm manager, but vaccination teams usually make sure that it has happened before they leave the shed. Ventilation should be reviewed and adjusted by the farm manager on exit from the shed.

Conscientious vaccination teams also notify the farm manager of any problems found in a shed. This includes faulty fans, feeder problems, leaking drinkers, signs of rodents or wild birds, and any other maintenance issues.

7.2 SUMMARY

CHECK THE WELFARE OF VACCINATED BIRDS

- ✓ Know your responsibilities.
- ✓ Watch birds carefully.
- ✓ Identify any behaviour outside the normal range.
- ✓ Report any problems.

7.3 Culling Birds

Culling is the process of identifying a seriously sick or injured bird and removing it from the flock. Culls are birds identified as needing to be removed from the flock. Vaccination culls are usually birds with serious injuries, and do not usually exceed 1 in 1000 birds (0.1% of the flock). Cockerels and runts, and birds with other abnormalities are usually also culled.

Your responsibility in the culling process is to identify and separate the birds with problems. It is up to the farm manager to decide what to do with these birds – that is, whether to kill them or not.

Sometimes you may be asked to euthanise birds, but most farm managers will do the job themselves or get their staff to do it. Never kill a bird without permission, unless there is an immediate need to do so. Ensure that you follow the Welfare Code and the "Development and Extension of Industry Best Practice for On-Farm Euthanasia of Spent Layer Hens" as to permissible methods of euthanasia.

7.3 SUMMARY

IDENTIFY BIRDS TO BE CULLED

- ✓ **Identify and separate birds with serious problems.**
- ✓ **Follow farm manager or team leader instructions.**

7.4 Records

Records are needed to show what happened in a vaccination job. This is an important part of quality assurance, because your records may be audited to see that you have achieved the required standards. Records also help protect you if there is a dispute with a farm manager some time after the vaccination.

Records are usually kept in a diary, on a form, or by a combination of both. Important information to record includes details of the farm, the birds, number vaccinated, the vaccine(s) used, including batch number(s), vial sizes, diluent batch numbers, and any problems you encounter. Other information may also be recorded, provided that you have a reason to keep the record. Some farms require this type of information to be entered onto forms related to their quality assurance programs.

Your role may include recording the vaccination details. This means writing clearly and filing the records in the appropriate place so that they can be analysed later. It is especially important to check that the number of birds vaccinated matches the number of doses shown on the vaccine vials.

7.4 SUMMARY

RECORD THE VACCINATION

- ✓ **Fill in vaccination records.**
- ✓ **Write clearly.**
- ✓ **File the records in the appropriate place.**

7.5 Self-Assessment Activities

1. **Check the procedures used by your team or farm for:**
   a. **clean-up**
   b. **checking birds**
   c. **culling birds.**
2. **Ask your team leader or farm manager to explain the records your team/farm keeps.**
3. **Practise completing the records you need to keep.**

APPENDICES

Appendix A
Self-Assessment

The following page shows a series of questions that you can use to assess your vaccination techniques and performance. Tick each one when you are sure that:

- you can carry out the task
- you know why you need to carry out the task
- you can vary the task according to circumstances.

Question	Yes
BEFORE YOU VACCINATE: Can you:	
Follow biosecurity procedures as specified by the farm and vaccination team?	
Seek vaccination instructions and confirmation with farm or team management?	
Communicate with the team to ensure smooth operation of the vaccination process?	
Select, check and maintain equipment and tools suitable for vaccination?	
Set up equipment according to the age of the birds and the type of vaccine administered?	
Calculate vaccine dilutions and doses?	
Implement occupational health and safety requirements by identifying risks and implementing suitable controls?	
DURING A VACCINATION: Can you:	
Handle birds according to the relevant Codes of Practice to facilitate correct vaccination?	
Regularly assess the quality of the vaccination?	
Vaccinate according to instructions?	
Achieve industry quality standards for vaccination?	
Vaccinate according to manufacturer's guidelines?	
Assess bird welfare regularly?	
AFTER YOU VACCINATE: Can you:	
Check the welfare of vaccinated birds and make adjustments where necessary?	
Cull birds according to instructions?	
Measure vaccine uptake according to manufacturer's guidelines?	
Record and report relevant information according to farm and team requirements?	
Complete exit biosecurity procedures in line with farm and team procedures?	
Clean, sanitise and maintain equipment and tools according to team procedures?	

Appendix B

Examples of Poultry Vaccines used in Egg Layer Breeders and Commercial Egg Layers

Method	Vaccine
Through drinking water	AE, IB, NDV4, ILT, live infectious bursal disease (IBD), chicken anaemia virus (CAV), *E. coli*, *Salmonella* Typhimurium
Coarse Spray or Aerosols	IB, Coccidiosis, *E. coli*
Gel droplet	Coccidiosis
Eye drop	IB, AE, IBD, NDV4, ILT, CAV, MG and MS Coccidiosis
Skin scarification	Fowl pox
Intramuscular injection	Live and killed Fowl cholera, IBD (killed), ND (killed), and EDS, Coryza, *Ornithobacterium rhinotracheale* (ORT) *Campylobacterium hepaticus* (Spotty Liver Disease), *Salmonella* Typhimurium and killed autogenous bacterial vaccines
Subcutaneous injection	IBD (killed), Type 1 Marek's, Herpes Virus of Turkeys (HVT), fowl cholera, NDV (killed) and EDS
Through the egg	HVT and other Marek's disease vaccines (Rispens, Bivalent)

Note:

1. Vaccines may change over time and new vaccines may become available.

2. IBD, CAV and IBD vaccines are used for layer breeder birds.

Appendix C

Generic Vaccination Program for the Commercial Egg Layer Fowl*

Age	Vaccine	Type	Method
At hatch	Marek's (Rispens +/_ HVT)	Live	Injected
	Infectious Bronchitis	Live (mild strain)	Coarse Spray
	Fowl Pox	Live	Wing Stab
	Coccidiosis	Live	Coarse Spray
	Salmonella Typhimurium	Live	Coarse Spray
2 weeks	Infectious Bronchitis	Live (mild strain)	Water/Spray
	Fowl Pox	Live	Wing Stab
	Newcastle Disease (V4)	Live	Water/Spray
	Coccidiosis	Live	Eye
	Salmonella Typhimurium	Live	Water
6-12 weeks	*Mycoplasma gallisepticum* and *M. synoviae*	Live	Eye drop
	Newcastle Disease	Live	Water
	Infectious Laryngotracheitis	Live	Water
	Fowl Pox	Live	Wing Stab
	Infectious Bronchitis	Live (more virulent strain)	Water/Spray
	Avian Encephalomyelitis	Live	Eye/Water
	Fowl Cholera	Killed	Inject
	Coryza	Killed	Inject
	Egg Drop Syndrome	Killed	Inject
	Spotty Liver Disease	Killed	Inject
	Salmonella Typhimurium	Live	Water
14-16 weeks	Newcastle Disease	Killed	Inject
	Infectious Laryngotracheitis	Live	Water/Eye
	Infectious Bronchitis	Live (more virulent or different strain)	Water
	Fowl Cholera (booster)	Killed	Inject
	Coryza (booster)	Killed	Inject
	Spotty Liver disease	Killed	Inject
	Salmonella Typhimurium	Live	Inject
Every 8 weeks (layers)	Infectious Bronchitis (boosters)	Live with alternating serotype vaccines	Water

* Some of these vaccines are optional depending upon the disease history of the farm and the area where the farm is located. Veterinary advice should be sought in choosing an appropriate vaccination program for the farm.

Appendix D

Reconstituting Vaccines

Freeze-dried vaccines

Two ways that freeze-dried vaccines can be reconstituted are:

1. A small amount of diluent is injected with a syringe into the vial, which is shaken to dissolve the vaccine pellet. The resulting solution is then sucked back into the syringe and injected into a larger diluent container. This container is then shaken to further mix the vaccine with the diluent. Repeat this step with a small volume of the diluted vaccine to completely flush out the vial contents. The diluent is provided by the vaccine manufacturer and is used instead of water to reconstitute the vaccine. It is important to use the diluent provided by the manufacturer as it is tested to be compatible with the vaccine. It helps the vaccine mix into a solution ready for vaccination. This technique is suitable for vaccines used for injections or as an eye drop. A whisk can be used to break up any vaccine clumps.
2. The vial top is removed and the vial is held on an angle as it is dipped in the prepared mixing fluid to about half-fill the vial. The vial is shaken to dissolve the pellet, and then tipped back into the mixing fluid before being put in the watering system header tank.

Frozen liquid nitrogen

The preparation and use of liquid nitrogen vaccines such as Herpes Virus of Turkeys (HVT) and other Marek's vaccines are very specialised tasks, which require detailed instructions and training of staff (mainly in hatcheries) to ensure safe and effective vaccination. The handling of liquid nitrogen and the removal of frozen vials can have significant occupational health issues. The tasks involved are specialised, and standard operating procedures, manuals and training courses are provided by vaccine companies, poultry company staff and consultant veterinarians.

Appendix E

Mycoplasma Vaccination Procedure

- MG (ts-11) and MS-H vaccines are live frozen (not freeze-dried) vaccines. Hence, special precautions must be implemented during their transport, storage, thawing, administration and subsequent management.
- Check that the vaccines are frozen on delivery and have not thawed at any stage during transport (vials that have thawed and refrozen will show separation within the vial and frozen vaccine may be on an angle.
- Store in an alarmed, non-defrosting freezer at -20°C or less. Thawing-refreezing can inactivate the vaccine.
- Use within 4 weeks of receipt.
- Keep frozen until use when transporting from storage to farms.
- Thaw unopened vials rapidly in a large (5-10 L) volume of warm (35°C) water.
- Include a blue dye (0.3 mL per 30 mL bottle) in the vaccine after thawing.
- Eye drop administer the entire contents of a vial within 2 hours after thawing.
- Check that there is dye on the tongues of a sample of vaccinated birds shortly after vaccination to confirm correct administration.
- Do not use antibiotics effective against avian mycoplasmas for one week prior to and for four weeks after vaccination, or routinely thereafter in either feed or drinking water, or the vaccine could become ineffective.

Appendix F

Killed Vaccination Procedure

- Check that the vaccine is not frozen on delivery.
- Store vaccine at 2-8°C in an alarmed refrigerator. Do not freeze, as freezing destroys the emulsion, making the vaccine ineffective. Discard any vaccine bottles showing “separated emulsion”.
- Check that the correct vaccine is to be administered. Check the expiry date and record the batch number. Rotate stock to use the oldest vaccine first.
- Remove the vaccine from the refrigerator the day before use, or warm in a water bath to allow the vaccine to reach 15-25°C.
- Transfer the vaccine to the farm in a container without ice so that the vaccine is administered at 15-25°C.
- Shake the vaccine vigorously to ensure thorough mixing prior to and during administration. Addition of a blue dye to a vaccine bottle can demonstrate the extent of shaking necessary.
- Calibrate the vaccination gun prior to and during use as required, by injecting at least 10 doses into a syringe or measuring cylinder to confirm the correct dose of the injection.
- Penning up, catching and handling of birds must be done carefully to prevent smothering or physical damage to birds and to ensure that all birds are vaccinated.
- Dimming lights in the house reduces flightiness of birds but there must be adequate light intensity where the birds are being vaccinated for safe and efficient vaccination.
- Handlers must hold the birds securely and present the birds correctly to the vaccinators to facilitate efficient and safe vaccination. If bird struggles or flaps, regain control before presenting it to the vaccinator.
- Vaccinators should wear protective gloves. If vaccine is injected accidentally into staff, management should be immediately advised and appropriate medical attention sought.
- Use new needles every 1000 birds. The length of the 18-19 gauge needles should be appropriate for the bird size and the vaccination technique.
- Inject the required dose (usually 0.5 mL) of vaccine into the fleshiest part of the breast or under the skin of the lower neck, as per label instructions.
- Ensure that a full dose of vaccine is injected before withdrawing the needle. This step can be done incorrectly if the procedure is being rushed.
- The farm manager should observe vaccine administration to confirm that the vaccine is being injected correctly into the fleshiest part of the breast and safely to prevent “needle-stick” injuries to staff.
- Reconcile the number of doses used against the number of birds vaccinated.
- Dispose of empty containers by wrapping in paper and putting in the garbage. Discarded needles should be placed in a designated and appropriately labelled “sharps” container.
- Record the vaccine name and batch number on the house chart/vaccination schedule.
- Blood test at least 20 birds six weeks following vaccination for IBD, ND or EDS as appropriate.

Appendix G

Drinking Water Vaccination Procedure using a Medication Tank

- Store live freeze-dried organism vaccines in an alarmed freezer. Mycoplasma and Avian Encephalomyelitis frozen vaccines must not be stored in an auto-defrosting freezer, as freezing-thawing inactivates the vaccines.
- Clean the medication tank and water lines the day before vaccination and flush with clean water.
- Check that the correct vaccine is to be administered. Check the expiry date. Rotate stock to use the oldest vaccine first. Record the batch number.
- Read the vaccine manufacturer's recommendations on the label and label insert.
- Vaccinate early in the morning.
- Transport vaccine to farms in insulated containers containing ice or ice bricks, and keep out of sunlight.
- Check that all drinkers are working.
- Turn drinkers off and allow flock to drink remaining water in the drinkers over a 20 minute period.
- Withdraw water from the flock for 1-1.5 hours depending on weather conditions by raising the drinker lines or drinkers above bird height.
- Calculate the quantity of water that will be drunk within 1.5-2 hours and add 5-10% to allow for "dead spots" in the medication tank.
- In a clean room add and mix blue stabiliser powder/tablets or 2.5 g skim milk powder or solution/litre of water into a small volume of cool water and mix into cool water to be used for vaccination.
- Remove the metal cap from the vaccine bottle, submerge the vaccine bottle in 1-2 litres of chlorine-neutralised water in a clean dedicated container, remove the rubber bung, allow water to enter the vaccine bottle while gently mixing to dissolve the vaccine pellet, rinse the vaccine bottle thoroughly and ensure that the vaccine is mixed well throughout the water in the container.
- Thoroughly mix the dissolved vaccine into the neutralised water in the medication tank.
- The nipple lines or bell drinkers should be raised above bird height when filling with water containing vaccine to ensure all birds have equal access to vaccine when the lines or drinkers are lowered. Alternatively, prime the water lines with vaccine before the lights come on in the morning.
- Allow water to drain out of the end of nipple lines until milk powder or blue dye is seen exiting from all nipple lines, and then lower the drinker lines to bird height.
- Increase light intensity and activate feeders.
- Walk the flock at least twice during the administration period to encourage uniform consumption and to make sure that vaccine is flowing to all the drinkers.
- Monitor the time taken to consume the vaccine to confirm the water quantity calculations were correct.
- Turn on the mains water when the vaccine water is fully consumed and check for air locks.
- Record the vaccine name and batch number on the house chart/vaccination schedule.
- Checking tongues for blue colouration as per the manufacturer's instructions and blood testing can be used to evaluate the efficiency of vaccination.

Appendix H

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