

Salmonella Enteritidis

A GUIDE FOR PRODUCERS





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1 Understanding the organism

The Australian egg industry has been responding to a series of detections of *Salmonella* Enteritidis (SE) since September 2018. SE is a notifiable disease under state legislation because it causes significant illness in humans and is not considered endemic in commercial poultry in Australia.

The bacteria is able to survive for long periods without a host and can multiply in the right conditions without a host animal. This means it can be carried long distances on vehicles, eggs, packaging, clothing, in people's hair, and can survive and multiply in feed and drinking water.

SE is commonly associated with poultry but the bacteria has a very wide host range. Rodents and reptiles can be prolific carriers, with a single mouse pellet containing up to 10,000 bacteria. Wild birds, insects, livestock and domestic pets are all potential carriers of SE as well.

Sunlight will kill SE but dust protects it from direct UV light so the bacteria can be present in dirt and dust and be spread in the wind.

Infesting hens

Unlike most other *Salmonella* species SE infects a hen's ovary and oviduct, which means the bacteria gets deposited inside the contents of the egg as it forms. For this reason, washing and sanitising eggs does not eliminate the risk of eggs carrying SE.

Hens only need a very low infectious dose of the bacteria and older birds may display no symptoms of the disease. SE has been known to cause higher mortalities in some flocks and symptoms such as depression and lethargy can be observed. Young chicks are most susceptible to infection and disease.

Hens will continue to harbour and shed the bacteria for life once infected but shedding in or on the egg is sporadic. This makes egg testing unreliable as a means of identifying infected hens.

Producers also need to be confident their chick and pullet supplier remains free of the bacteria because SE can be spread by vertical transmission, meaning offspring can become infected from their parents.



Vaccination

There is no vaccine on the market registered against SE in Australia. *Salmonella* Typhimurium vaccines may protect hens against SE, but are not fool-proof, and vaccination cannot be relied upon as the sole control method.

Vaxsafe ST[©] and Poulvac[®] ST are the only registered commercial live vaccines to protect against *Salmonella* Typhimurium in Australia. It is recommended to follow label instructions, and to use according to veterinary instructions.

Maintaining a good vaccination program for other diseases, such as Infectious Laryngotracheitis (ILT), Fowl Cholera and Newcastle disease will support better flock health and reduce immune stress. This will improve a bird's immune response to potential *Salmonella* infection. It is very important to follow the vaccination procedures recommended by veterinary experts and breeders.

For comprehensive information on methods for vaccination refer to the [Australian Eggs Vaccination Manual](#). Appendix C on page 45 details a generic vaccination programme for laying hens as a guide.

For more information on vaccinating your flocks, refer to:

📖 [Vaccination Manual](#)

📖 [Salmonella Incidence Response Plan Synopsis pg 31](#)

Killing SE

The two easiest ways to kill SE are by heat or chemical use.

Temperature

There are different time and temperature requirements for killing *Salmonella*, but as a general rule 70 degrees Celsius for 30 seconds will kill the bacteria. Moist heat (steam) is useful wherever it can be used without causing damage to the item being sanitised as bacteria are more likely to be destroyed with moist rather than dry heat.

Dry heat such as a flame is an obvious fire risk so steam cleaning is generally a safer option.

Cold temperature will not kill the bacteria, not even freezing temperatures.

Chemicals

A wide range of chemicals will kill SE, but not all, so it is important to choose the right one. Your sanitation program needs to target all potential pathogens, including viruses.

Importantly, direct contact with the organism must occur. Scrubbing or high pressure washing with detergent before sanitising is therefore critical to remove biofilms, organic and foreign matter. Chemical and pH strip papers can be used to assess chemical application and protein presence swabs to test removal of protein and biofilms from surfaces.

Water quality can have an impact on the effectiveness of sanitisers – pH, hardness, nitrate levels, iron levels, conductivity and organic load are all known to lessen the efficacy of sanitisers. Mixing two or more chemicals is not good practice as it is possible that both will be inactivated by the other.

Phenolics and quaternary ammonium compounds (QUATs) are commonly used but their effectiveness depends on the active ingredient. Only third (or higher) generation QUAT compounds should be used. As a final disinfection step in a sanitation program on a farm, phenolics and QUATs may not be broad spectrum enough for the full range of bacteria and viruses encountered. The use of formaldehyde or 'thermal fogging' might be necessary, especially in the fumigation of sheds.

Regardless of the chemical that is used, it is extremely important to follow the instructions on the label as chemical tolerance can develop in SE if incorrect dilutions are used.

Table 1 - List of chemicals, their appropriate uses and indicative application rates

These application rates and uses are an indication only. Seek veterinary or sanitation consultant advice prior to using and applying any of the following chemicals.

Surface and/or Use	Conc. %	Rate of appl. L/ m2	Active Ingredients
General cleaning of surfaces <i>Note: Use products that 'foam'</i>	2%	0.5-1.0	Benzalkonium chloride (10-30%) + Phosphoric acid (10-30%)
	2%	0.5-1.0	Citric acid 10-15%, methansulphonic acids 2.5-5%, glycosides 2.5-5% <i>Detergents with disinfectant properties required for surfaces with Salmonella</i>
Cleaning of very soiled surfaces <i>Note: Use products that 'foam'</i>	1-2%	0.5-1.0	Sodium Hydroxide (1-5%)
	1-2%	0.5-1.0	Quaternary ammonium cpd. QUATs (38g/L) + Sodium metasilicate (63g/L) <i>Detergents with disinfectant properties required for surfaces with Salmonella</i>
Water storage tanks, medication tanks and drinker lines	0.40%		Hydrogen Peroxide (~250-300 g/L) + Peracetic Acid (~50-65 g/L)
Relatively clean surfaces, silos and egg handling areas; can be useful product for surfaces susceptible to corrosion	2%	0.5-1.0	Quaternary ammonium cpd. QUATs (100 g/L)
Footbaths, Shed entry			Quaternary ammonium cpd. QUATs (100 g/L) Oxidising disinfectants Iodine (16 g/L)
Poultry sheds, shed equipment and roadways	2%	0.4-1.0*	Glutaraldehyde (150 g/L) + Quaternary ammonium cpd. QUATs (120 g/L) <i>Ensure workers have full face gas mask (similar to formaldehyde safety)</i> Add 1/10 Glutaplusto to Glutachem to increase pH
	various	various	Oxidising disinfectants
Dirt floors, shed aprons and free-range areas	100%	0.5	Hot Lime: Calcium Oxide (≥ 88%) – requires high level safety
		kg/m2	Hydrated Lime: Calcium Hydroxide – requires high level safety
			Glutaraldehyde (150 g/L) + Quaternary ammonium cpd. (120 g/L)
			Chloramine 2.5 g/kg + Iron sulphate 21 g/kg + Copper Sulphate 25 g/kg
Formalin fumigation of sheds	100%	24.4 ml/m3	Formaldehyde (377 g/L) – use professionals (general recommendation)**
Thermal fogging of various disinfectants			Use products that are shown to inactivate <i>Salmonella</i> (confirmed studies)
Electrical leads/items			Alcohol wipe

Note: Ensure dilutions and application rates are according to labels for the inactivation of bacterium and *Salmonella*

* Higher application of GLUT is recommended on outside grounds and hard to clean areas, e.g. shed apron areas, drinker, feeders, side vents

** There are various products that can be used instead of Formaldehyde. e.g. thermal fogging



2 Protecting against SE

Entry to property

Strict biosecurity practices at the farm gate will minimise the risk of SE entering a production area. It is the easiest and most effective way to protect your farm.

Restrict Entry

Keep gates locked and restrict the movement of people, equipment and vehicles into production areas as much as possible. This means only allowing entry to personnel and items that are absolutely necessary for the functioning of the business. Designated parking needs to be provided outside production areas for those vehicles that do not need to travel inside (see *Figure 2* on page 10).

For all essential supplies, it is important to know that they are coming from an SE free source. Ask suppliers to show *Salmonella* testing records or a letter explaining how risks are managed. Written records of all deliveries and stock transfers, transfer personnel and vehicles are essential, and all records should be kept for a minimum period of two years.

All farm sites should have a biosecurity sign, restricting entry to any personnel and vehicles at any entry points. Where possible, vehicles such as feed trucks should use alternative roads on the property.

Figure 1 - Sample of biosecurity signage on farm gates



All properties need to have sanitation equipment available at the gate to wash down and sanitise vehicles and equipment.

Wheel/Vehicle wash

There are two types of wheel wash that can be used.

1. Bath

Install a concrete causeway that vehicles have to drive through

Fill to a depth of 200mm of sanitising solution

2. Hosing or spraying

Use a venturi system (dosing system that fits onto a regular hose)

Spray wheels and wheel wells

Solution: needs to be broad spectrum, uv-stable, organic matter stable, environmentally safe. Examples of these include:

- Iodine (16g/L) – this is generally more stable in an outside environment
- Quaternary ammonium compounds (QUATs) (100g/L) – some of these may not be suitable in an outdoor environment for long periods of time.
- Oxidising disinfectants

Changed: daily or when depleted, and checked regularly

Buying in eggs from other farms

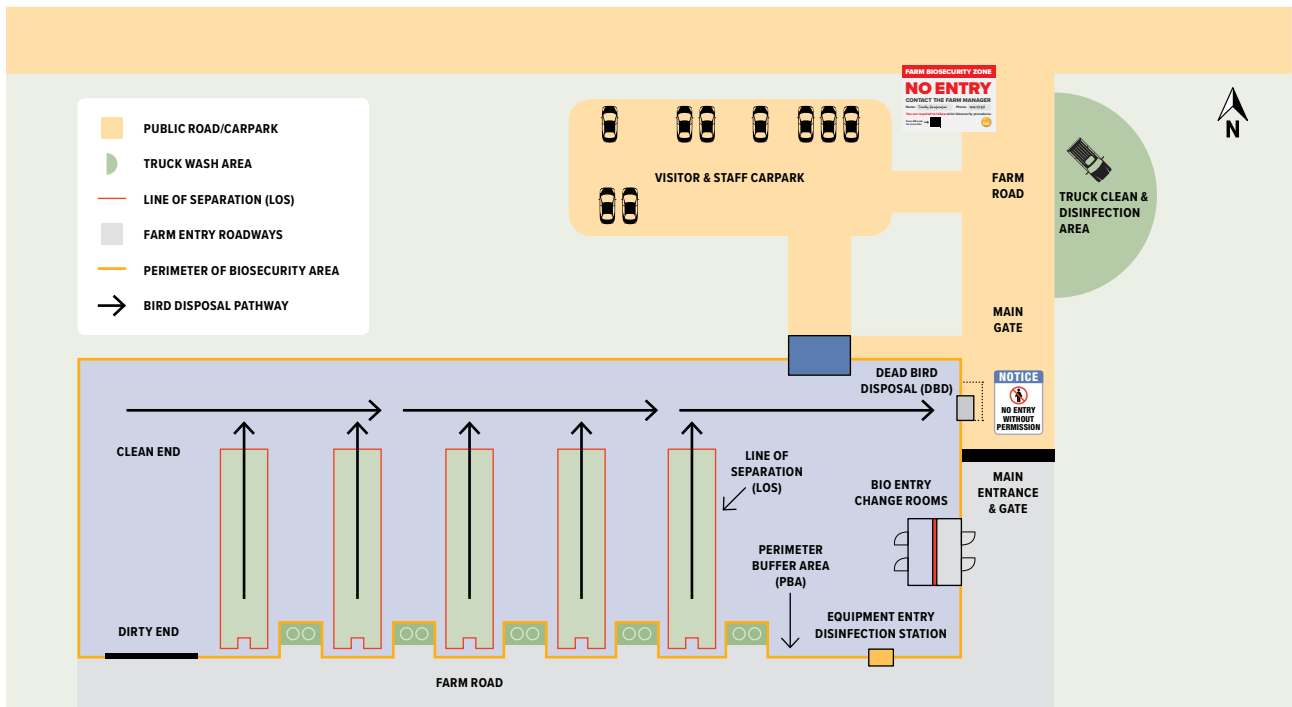
Businesses should avoid buying in eggs from other farms as much as possible because the movement from farm to farm is a biosecurity risk. If it is unavoidable, ensure incoming eggs come directly from tested SE-free farms and are not on-sold from unknown sources.

Traded eggs should be handled in any packing and grading facility at the end of the day (after a business's own eggs) and all equipment should be thoroughly sanitised afterwards.

Vehicle Movements

If there is multiple poultry production sites in a single farming business, it is important to minimise the potential for vehicles to cross-contaminate flocks. Restricting vehicle movement to one way in one day

Figure 2 - Example of an ideal layout for a farm




and following low risk (cleanest) to high risk (dirtiest) movement principles will lower contamination risks. It is also important to wash down vehicles and have designated pick-up areas.

Vehicles picking up or dropping off chicks, pullets and spent hens should only transfer one single age flock in any one day from a particular production area.

Pick-up vehicles, modules and crates should be thoroughly cleaned and disinfected between loads both on entry and exit. A thorough inspection of the vehicle and trailer should be undertaken prior to farm entry and movements of the driver and crew validated.

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People

All properties need to have clear biosecurity signage (see *Figure 1* on page 9) and entry instructions at the front gate. This includes having a visitor log book so all entries are recorded. (See *Figure 3* on page 11). These records should be kept for a minimum two-year period.

Only people essential to the running of the business should be allowed into production areas – including poultry housing areas and packing and grading facilities. Visitors should be supervised at all times.

Staff and any visitors must be vetted to ensure they have had no contact with other poultry, livestock or backyard birds in the previous 72 hours. They must have not suffered gastroenteritis and have not returned from overseas travel in the past seven days.

Any person entering the farm, including service personnel or vets, should be wearing hair nets, coverall (disposable) suits and fresh clean boots (or boot covers at a minimum). A change of clothing and boots for each shed is best practice (See *Figure 6* on page 13).

All visitors should observe the same movement rules as farm staff by moving from lowest to highest risk sites, and not the reverse.

Figure 3 - Example of a visitor logbook

FARM MANAGER NAME: _____ FARM MANAGER CONTACT NUMBER: _____

VISITOR LOG

Date	Name, Contact number (& business name)	Poultry contact in last 72hrs (Y/N)	Recent overseas travel past 7 days (Y/N & provide details)	Recent food borne illness (Y/N)	Reason for visit	Time in	Signature	Time out	Vehicle rego (if driving on)


FARM NAME: _____

Figure 4 - Example of visitors wearing protective equipment



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Other animals

Wild animals should be kept away from sheds and ranges through fencing or other means and livestock such as sheep and cattle should not be grazing in production areas.

Discourage wild birds and rodents by not having open water or feed outside and clean up any feed spills immediately upon noticing them.

Essential supplies

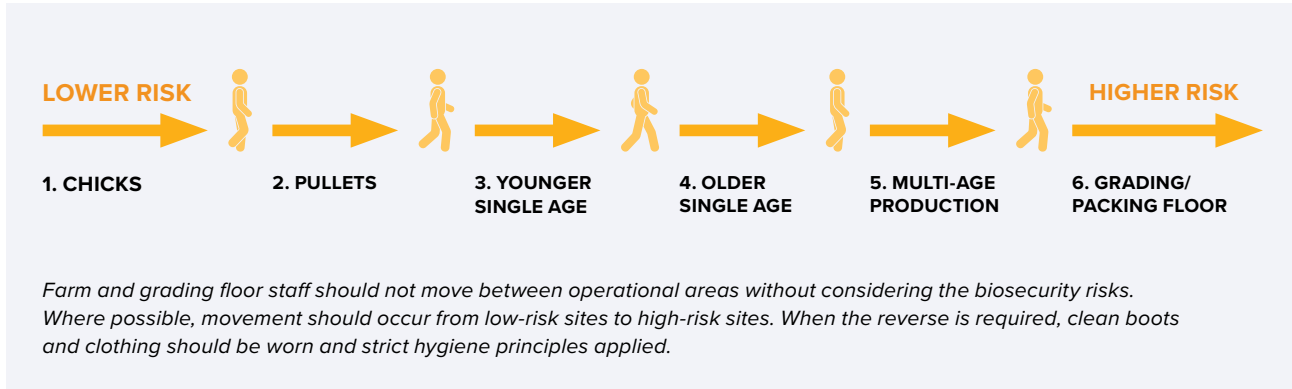
Ensure delivery and pickup vehicles are sanitised between farm visits and before and after entry onto any property. Farm management can direct contracted trucks (or other vehicles) to return to the depot to be cleaned if they are unhappy with the level of cleanliness before entering the farm.

Waste pickup vehicles should not enter the farm. This can be managed by putting a fenceline pickup arrangement in place. Feed trucks should also be kept outside the production area if possible.

Feed

Heat treatment processes for pelleted feed can reduce bacterial load but may not be sufficient to destroy all *Salmonella*. All raw ingredient and heat-treated feed batches received on-farm must be accompanied by supplier testing records or a letter outlining how the supplier manages *Salmonella* risks.

Figure 5 - Staff movement on farm



Where possible, source feed that is feedsafe accredited, as this certifies it has been tested for *Salmonella*.



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Free range

Free range farming exposes flocks to greater risks of environmental infection compared to cage and barn housing. To manage this, there needs to be greater focus on management of environmental risks, particularly preventing contact with wild animals like birds.

Robust fencing, wildlife deterrents and removal of surrounding bodies of water is critical. Any piles of debris or equipment should be removed from housing surrounds as this can harbour rodents and pests.

Dry sanitisers are available and can be dusted around the range area to minimise the risk of SE establishing itself on the range – such as

- Chloramine 2.5 g/kg + Iron sulphate 21 g/kg + Copper Sulphate 25 g/kg - this is safer to use around animals
- Hydrated lime (calcium hydroxide)

(See *Table 1* on page 7 for more information).



Figure 6 - Example of change station

At the shed

As a general rule, no-one should enter a shed unless it is absolutely necessary and there must be strictly controlled entry procedures for people that do. This includes changing footwear and using footbaths, wearing hair protection and sanitising hands.

Hand washing and sanitising facilities should be available at the entry point to any production area.

This may be in the form of a pump pack instant hand sanitiser (alcohol), or a tap, sink and hand sanitiser. It is important to understand that sanitising with organic material on your hands will not necessarily kill all germs and it is necessary to wash your hands first.

Brooding and rearing facilities should be geographically separated from production facilities and, if possible, have dedicated staff for each so movement between them is minimised. If this is not possible, movement should occur from low-risk sites to high-risk sites and if the reverse direction is required, clean boots and clothing should be worn and strict hygiene and hand washing practices applied.

Staff should shower and wear clean clothing each day. Best practice would require each staff member to shower upon entering the farm premises and change into clean clothing provided by the farm. Footwear is a particular problem as it can carry large amounts of manure and other organic matter.

Also ensure staff and other essential people on the farm have not experienced symptoms of gastroenteritis or diarrhoea in the last seven days.

While not all farms are large enough to assign individual staff to specific areas within the business, it is important that staff from grading or packing rooms do not enter sheds.

Where possible, smaller farms will need to make sure grading facilities are visited last when staff need to enter both poultry housing and grading/packing floors.

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Clean and dirty ends

It is good practice to have a “clean” end of poultry housing for personnel entry and placement of birds and a “dirty” end of the shed for manure, spent hen and waste removal.

Change stations

All farms should introduce a version of an anteroom, or changing station, at all poultry housing and packing/grading floor entrances. This means having transition zones, where people change out of the clothes they are wearing, wash and sanitise, and then put on clean clothes and boots. This involves having shed-specific clothing and footwear wherever possible.

Footbaths

These may be used as well as change zones, or less preferably instead of change zones, as a less effective alternative.

Where footbaths are used, the correct chemical must be used at the right concentration for an appropriate length of time for them to be effective. (See *Table 1* on page 7) – chemicals to use are:

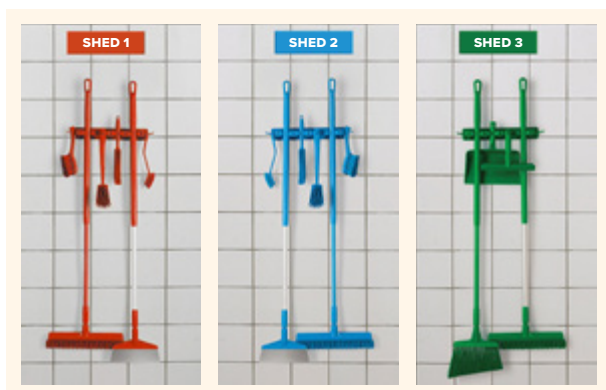
- Quaternary ammonium compounds (QUATs) (100g/L)
- Iodine (16g/L)
- Oxidising disinfectants

Brushes or scrapers should be provided to remove organic matter on footwear, prior to using the footbath.

Shed equipment

As much as possible, there should be specific equipment like buckets, barrows and brooms, dedicated to each shed. If equipment needs to be brought in from outside, it should also be sanitised in the anteroom, using the same chemical that is used in the footbath. Using different coloured equipment for different sheds or farm sites will help to reduce spread and contamination. E.g. shed or farm one = red, shed or farm 2 = blue etc.

Example of colour coding equipment



Water


Effective sanitation must be in place for all water, including drinking, washing and cooling. In most cases, treated town water will be appropriate, but in some rural areas dam or tank water needs to be filtered and treated with chlorine or an acceptable alternative such as chlorine dioxide. This includes town water reservoirs on-farm.


Surface water can become contaminated with *Salmonella* by rodents, wild birds and other environmental factors. Treating the water to reduce contamination risks can be technically challenging and it is recommended a trained person undertake this.

Refer to the *National Water Biosecurity Manual* Poultry Production for more information on water sanitation requirements.

Water should be tested for both chemical presence and microbial levels on a regular basis.

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Other animals

Companion animals and livestock should be kept out of any production areas. Any guard animals such as dogs and alpacas should be tested for *Salmonella*.

Minimising wild birds on-farm requires feed and water access and opportunities for roosting and nesting to be removed. Shed walls, roofs and floors must be kept in good repair to prevent gaps that can allow wild bird entry and all doors should be kept closed when not in use.

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Rodents and Pests

Vermin and pest bait stations should be used, particularly in areas close to feed, and checked weekly. Bait stations should be placed at regular intervals of no more than 10m apart around the outside perimeter of the shed, and a minimum of 15m between baits at the farm and range perimeters. Create a map of all placed bait stations.

Fly bait and or fly surface spray should be used as required, especially in summer.

Steps should be taken to remove feed and water sources from rodents and pests, including removing all rubbish, vegetation, trees and shrubs within the immediate vicinity of poultry housing. A clear radius of 1.5m should be maintained at all times. No poultry feed and water should ever be supplied outside the poultry housing.

Mites and lice can harbour and transmit SE so infestations should be treated as soon as possible, using an approved insecticide.

Litter beetles should be controlled with appropriate products in the cleanout period.

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Cleaning practices

During the production phases, particular attention should be paid to the monitoring and cleaning of egg residue, dust, feathers and any foreign material on egg belts, elevators and anaconda systems. In cage systems, ceilings, floors and walls should be cleaned down weekly – swept or brushed at a minimum.

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Shed cleanout

In any production or rearing shed careful process needs to be followed after a batch of birds.

1. Remove all feed stock
2. Remove all manure and organic material from the shed
3. Apply approved detergent using high pressure low volume application (preferably as a foam) to remove organic material from surfaces. QUAT products are excellent foaming cleaners/sanitiser

4. Rinse detergent with high pressure, low volume spray
5. Apply sanitiser – glutaraldehyde buffered QUAT or double chain QUAT, or oxidising chemicals
6. Flush drinker lines with sanitiser – hydrogen peroxide, paracetic acid or iodine-based chemicals
7. Apply insecticide/beetle control product, replace rodent baits
8. Drain and sanitise any cooling pads – Bromide capsule
9. Disinfect amenity rooms and apron areas
10. Range areas can be decontaminated (See *Table 1* on page 7)

Swab/test for *Salmonella* prior to repopulation of the shed – see Testing for SE on pg 18 for more information on what is required of this.

Resanitise poultry housing prior to restocking the shed if it has been left empty for more than one month after sanitisation.

Feed storage facilities and silos should be cleaned at least once a batch, and more frequently if possible.

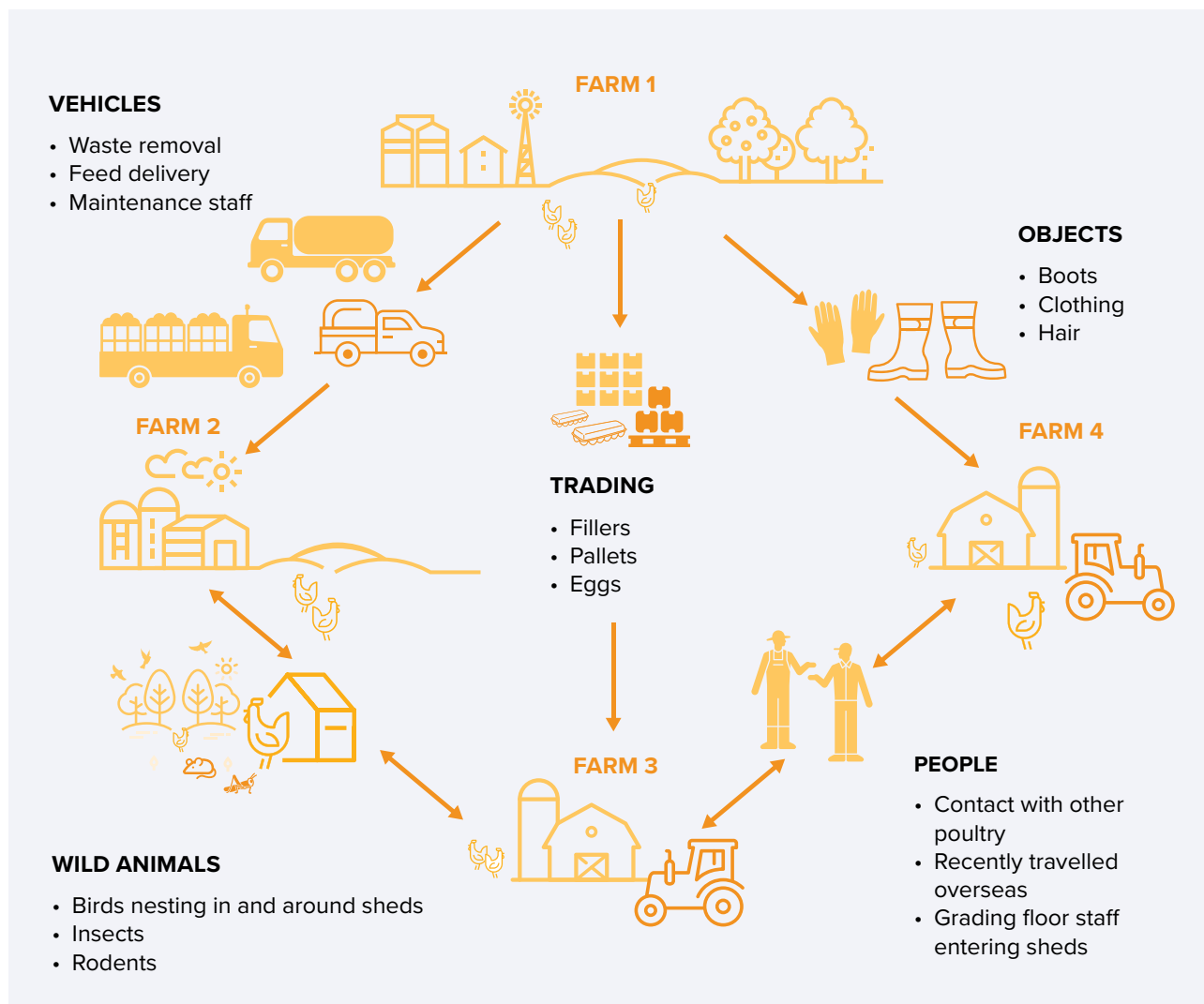
Refer to the [Salmonella Incidence Response Plan Synopsis](#) for more information about shed cleanout procedures.

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Figure 7 - Transmission routes



Storage, grading and packing

SE can survive for long periods of time on surfaces, flats or fillers, packaging materials (cartons and boxes) and pallets, and items that look clean are not necessarily so. Given the frequent movement of eggs from farms to grading and packing sites, it is essential to manage the risk of bacteria moving on items like cardboard or plastic flats. When sanitising fillers to protect against SE, the same principles of heat or chemical use apply.

Cardboard fillers used during egg grading and processing should ideally be discarded after every single use as they are absorbent and can retain bacteria for prolonged periods. If this is not possible, cardboard flats can be baked at 70 degrees Celsius for 30 seconds to kill any *Salmonella* bacteria but there is an obvious flammability risk to mitigate.

There are a number of commercial egg tray washing systems available for sanitising plastic trays and fillers, but the cost burden may be unmanageable for some businesses. Plastic trays can be cleaned manually providing there is physical washing to remove any organic material, including biofilms, and an appropriate chemical is used at the recommended concentration.

Different coloured plastic fillers may also be used to identify different sheds or production types.

Incoming goods

Businesses must only receive eggs, packaging material and other incoming goods from verified SE free sources. In addition, all deliveries need to be recorded so movement within the supply chain can be traced.



Traded eggs should be handled in any packing and grading facility at the end of the day and all equipment thoroughly sanitised afterwards.

Staff

Grading and packing staff should be kept away from poultry housing and sheds as much as possible and follow the same biosecurity principles on pet birds, livestock, overseas travel and illness as shed staff.

Businesses must maintain hygienic amenities for all staff and provide training in personal hygiene practices to prevent cross-contamination. All staff should also be trained in biosecurity and food handling practices.

Cleaning the packing/grading facility

Businesses must implement a full cleaning and sanitation program in the grading area at the end of every day and the quality of sanitation should be checked by swab testing surfaces. As with shed cleaning, it is critical to check that the chemicals being used are effective against *Salmonella*.

Where egg washing systems are in place, it is important to check the washing is properly sanitising the eggs and not spreading contamination. Any spills or broken egg material must be cleaned up as soon as it occurs.

More information on testing egg washing procedures can be found under *Testing for SE* on page 18, or on page 26 of the [Salmonella Incidence Response Plan Synopsis](#).



3 Testing for SE

It is a good idea to notify laboratories 24 hours in advance of sending samples to allow adequate time for preparation. If needed, laboratories can often supply the equipment needed to conduct swabbing procedures.

For a list of laboratories that can test for *Salmonella*, please refer to [page 16 of the Salmonella Incidence Response Plan Synopsis \(SIRP\)](#).

Swabbing

Swabbing should be conducted on a regular basis and the following frequencies are a good general guide:

Production sheds

- Sheds (and cages) should be tested 10 days prior to placement of birds for any diseases or organic loads
- Ideally each layer shed should be sampled around 17 weeks and again at 35 weeks of age
- For more information look at [pages 17-23 of the SIRP](#)

Day old chicks

- Performed prior to placing birds and again on day three after placing birds
- Some breeder flocks will have SE accreditation
- For more information look at [page 24 of the SIRP](#)

Grading and packing floor testing

- Essential where you handle any eggs from external sources
- This should be done every month
- For more information look at [page 27 of the SIRP](#)
- **Validate egg washing procedures**
- Important to check eggs are being properly sanitised
- This should be done every 6 months
- For more information look at [page 27 of the SIRP](#)

Swabs may be in the form of:

- Boot swabs (a special shoe cover)
- Gauze swabs with strings attached (or tampons)

Table 2 – Swabbing poultry housing

Type of sheds	Number of swabs
Sheds without pens or partitions	Three (3) swabs
Sheds with two or more pens	Two (2) swabs for each pen For example: <ul style="list-style-type: none"> ▪ Shed with 2 pens – 4 swabs required ▪ Shed with 3 pens – 6 swabs required
Single level shed or shed without pens or partitions	Two (2) swabs
Multi-level shed or shed with pens	Two (2) swabs for each pen or level
Deep litter + Slatted sheds	Four (4) swabs for each shed
Conventional multi-tier cages with manure belt	Two (2) swabs for each cage row
Conventional multi-tier cages with manure pit (without manure belt)	Three (3) swabs for each shed

National Monitoring and Accreditation Program

There is a National *Salmonella* Enteritidis Monitoring & Accreditation Program (NSEMAP) available to all commercial egg producers in Australia.

NSW Department of Primary Industries (DPI) administers the NSEMAP on behalf of all states.

An accreditation certificate can be issued by DPI for accredited flocks, which can be used as evidence of the *Salmonella* Enteritidis (SE) free status of these flocks and their eggs for export markets. It is estimated that more than 75 per cent of Australian layers are currently part of this program.

The NSEMAP has 3 stages

- i) Monitored Status – Stage 1/2
- ii) Monitored Status – Stage 2/2; and
- iii) Accredited Status

In order to become eligible for accreditation as SE-free, all the requirements of the guidelines must be met.

Fees will be charged on a cost-recovery basis. There is an annual accreditation fee of \$176.

All costs, as part of obtaining and maintaining accreditation in the NSEMAP (including sampling, testing and on-farm inspections), are the responsibility of the owner/s of flocks enrolled in the program.

To join, please contact

Jo Collins

Administrator NSEMAP

Work: 02 6391 3607

Email: jo.collins@dpi.nsw.gov.au

The Administrator will notify your state jurisdiction once you have joined the NSEMAP.

For more information, please visit the [NSEMAP website](#).

NOTIFICATION

Significant penalties may apply for failure to notify your state authority of an SE infection

**IF YOU THINK IT IS ON YOUR FARM NOTIFY
YOUR STATE AUTHORITY DIRECTLY,
OR CALL 1800 675 888 –
Emergency Animal Diseases Hotline**

The EAD watch hotline is a 24-hour-a-day, seven-day service

4 Producer checklist

1. Responsibility

- Have you appointed a competent biosecurity coordinator?
This could be you or anyone else properly trained in biosecurity.

2. Training

- Are all your staff and contractors trained in biosecurity procedures?
- Do you have current standard operating procedures for:
 - Egg washing and sanitation?
 - Pest control?
 - Cleaning and sanitation?
 - Biosecurity procedures?
 - Production site entry and exit?
 - Shed entry?

3. Facilities

- Do you have a biosecurity sign on all farm entry points?
- Do you have a biosecure, fully fenced perimeter?
- Do you have change zones and/or footbaths at shed entry points?

4. Personnel

- Are you allowing only essential personnel on farm?
- Does your farm have one-way human traffic flow, moving from areas of low to high risk only?
- Do staff or service personnel know not to come to work if they have gastrointestinal illnesses or food poisoning?
- Do staff or service personnel know they cannot own poultry or come into contact with any birds outside of work?
- Have you ensured that any service personnel have not visited another poultry farm in the past 72 hours?

- Do grading floor staff understand not to enter production sheds unless absolutely necessary?
- Are people visiting the site wearing protective clothing?

5. Pest Control and animals

- Is there a comprehensive pest/rodent control program in place?
- Have you ensured no other animals have access to production areas?
- Have you placed baits every 10m on the perimeter of sheds?
- Have you placed baits every 15m on the perimeter of the farm and/or range areas?
- Have you created a bait location map?
- Are you servicing baits weekly?

6. Inputs

- Are all your water sources sanitised?
- Are all your feed suppliers feedsafe accredited?

7. Transportation

- Do you have a visitor log book in place?
- Do you have vehicle, delivery and stock transport logs in place?
- Do you have wheel washing facilities in place for all vehicles entering and leaving the property?

8. Disposals

- Are all waste products disposed of so that they are not able to contaminate other sheds or poultry sites?
- Are all waste products transported in covered trucks?
- Have you dedicated clean (personnel, clean products, placement of birds) and dirty ends of the shed (spent hen, manure, waste removal)?

9. Cleaning and disinfection

- Do you regularly clean, remove dust, dirt and organic matter from any surfaces that contact eggs?
- Do you have strict cleaning procedures in place for washing, sanitising and disinfecting before placing new flocks into the sheds?
- Do you test sheds for *Salmonella*, organic matter and other pathogens prior to placing birds?
- Do you test and validate cleaning procedures to determine their adequacy?

10. Health

- Do you have a poultry vet servicing your flock?
- Are you vaccinating your flock according to an advised plan?

11. Testing

- Are you currently enrolled in a *Salmonella* Control and Monitoring program – NSEMAP or otherwise?
- Have you validated (tested) your egg washing procedures?
- Have you verified that your chick and pullet suppliers are *Salmonella* free?
- Have you verified that your feed sources are *Salmonella* free?
- Do you swab and test your:
 - production sheds?
 - feed and water sources?
 - grading and packing facilities?

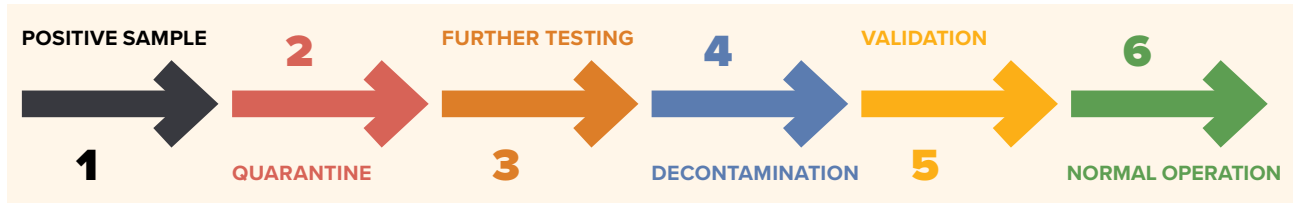
12. Audits

- Is there internal and external auditing of all biosecurity principles?



5 When a positive is detected

Response plan to a positive SE detection on farm



THE SE RESPONSE PLAN IS DESIGNED TO:

- ✓ Rapidly contain the infection on-farm
- ✓ Eliminate and remove any contaminated eggs from the supply chain
- ✓ Rapidly determine the extent of infection
- ✓ Eliminate the infection from any affected farms

1

POSITIVE SE SAMPLE RETURNED FROM:

- Regular on farm SE sampling and swabbing
- Notification by the health department of a suspected / confirmed human case of *Salmonella* infection – farm then sampled and swabbed

2

QUARANTINE

- The state chief veterinary officer (CVO) will impose a quarantine on the farm restricting the movement of all livestock, eggs, manure, equipment and farm waste

3

FURTHER TESTING

- Blood samples analysed for birds post exposure to SE
- Sheds and grading floors are swabbed for SE, including rat bait stations and all shed equipment and water sources
- Cracked and dirty eggs from all sheds are sampled and tested for SE
- State authority may also undertake further investigations, including:
 - » microbiological testing of staff
 - » tracking farm history and livestock movements
 - » assessment of biosecurity procedures, and implement any necessary changes

4

DECONTAMINATION

- Eggs from positive farms are traced through the supply chain and recalled
- All sheds, grading floors, vehicles and equipment thoroughly disinfected as directed by the CVO
- Eggs from all sheds on the site are sent for pulping and pasteurisation
- All vehicle movement ceases, unless approved by the CVO
- Secure removal of farm waste material
- State authority will stipulate where and how products or by-products should be disposed of by the farm management
- All birds for the affected sheds are depopulated. Producers are responsible for this. NOTE: Where the producer refuses to depopulate birds:
 - » All eggs from affected shed(s) must continue to go for pulping and pasteurisation.
 - » Site indefinitely quarantined
 - » The enhanced testing regime remains for all sheds.

5

DECONTAMINATION VALIDATION

- Thorough review of biosecurity & hygiene program, including pest control farm management will be required to implement a control program accordingly
- Maintain environmental testing of depopulated sheds at 7 day intervals

6

RETURN TO NORMAL OPERATION

- After two clear environmental tests, sheds may be repopulated as directed by the CVO
- Birds are not to be vaccinated with *Salmonella* vaccine (this would interfere with the ongoing monitoring program)
- Monitoring reduced to monthly sampling intervals for 6 months. Following this, testing frequency reduces to quarterly sampling
- Review future control program



