



# Extension and communication strategies to improve biosecurity

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by R. Osmond

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# Foreword

The Australian egg industry is diverse, comprising farms of different sizes, production systems and varying levels of biosecurity. Infectious diseases pose a constant threat and the impacts of outbreaks such as avian influenza and *Salmonella* Enteritidis can be devastating to individual farms and to the entire industry. Biosecurity plays a pivotal role in safeguarding the health, welfare, and productivity of commercial egg production in Australia. Maintaining robust biosecurity measures across all egg producing sectors is essential to mitigate the risk of emergency animal disease and food safety pathogen outbreaks, protect animal welfare, and ensure the supply of safe eggs for Australian consumers.

This project was conducted to develop targeted biosecurity extension and communication strategies designed with stakeholder input and engagement across all sectors. The purpose of this approach is to increase the level of ownership of the strategy, leading to improved knowledge and uptake of biosecurity practices across all sectors.

This project was funded from industry revenue which is matched by funds provided by the Australian Government.

This report is an addition to Australian Eggs Limited's range of peer reviewed research publications and an output of our R&D program, which aims to support improved efficiency, sustainability, product quality, education and technology transfer in the Australian egg industry.

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# Table of Contents

Foreword.....	ii
Acknowledgments.....	iii
About the Author .....	iii
List of Tables .....	v
Executive Summary.....	vi
Overall Conclusions.....	vii
1 Introduction .....	1
2 Project aims.....	2
3 Methodology.....	3
4 The current biosecurity landscape in Australia for egg producers.....	5
4.1 Biosecurity and food safety legislation, regulations and standards.....	5
4.2 Engagement with egg producers.....	7
4.3 Biosecurity resources .....	7
5 Strengthening Biosecurity: Extension and Communication Strategies .....	9
5.1 Large scale egg farms .....	9
5.2 Medium sized egg farms.....	14
5.3 Small scale egg farms.....	18
6 Roadmap to implement strategies .....	22
7 Egg farms and biosecurity: planning fact sheet .....	27
8 Recommendations and conclusions .....	29
References .....	30
Appendices.....	31
8.1 Appendix 1: List of workshop attendees.....	31
8.2 Appendix 2: Government biosecurity resources available online.....	33
8.3 Appendix 3: Australian Eggs and Egg Farmers Australia biosecurity resources available online .....	38
Plain English Summary .....	40

# List of Tables

<b>Table 1 List of regulators invited to online workshop. ....</b>	<b>31</b>
<b>Table 2 List of large egg farms invited to the online workshop. ....</b>	<b>31</b>
<b>Table 3 List of medium sized egg farms invited to the online workshop.....</b>	<b>32</b>
<b>Table 4 List of small sized egg farms invited to the online workshop.....</b>	<b>32</b>
<b>Table 5 Government and RDCs (other than Australian Eggs) biosecurity related information and resources available online .....</b>	<b>37</b>
<b>Table 6 Australian Eggs and Egg Farmers Australia biosecurity related information and resources available online .....</b>	<b>39</b>

# Executive Summary

Biosecurity is the foundation of commercial egg production, playing a crucial role in safeguarding the industry against the incursion of emergency animal diseases and ensuring food safety. With heightened concerns over disease outbreaks and foodborne illnesses, the implementation of rigorous biosecurity measures is more important than ever.

Biosecurity encompasses a range of practices designed to prevent the introduction and spread of infectious agents, protecting the health of flocks and the quality of eggs produced. Effective biosecurity protocols not only mitigate the risk of diseases such as avian influenza and *Salmonella* Enteritidis, but also enhance welfare and productivity.

Australia's commercial egg sector includes operations that vary in scale and production systems; from large-scale fully integrated companies to much smaller owner-operator farms, with eggs currently produced in three main production systems: cage, barn and free-range. Regardless of size or system, all producers face similar biosecurity challenges and must implement comprehensive strategies to prevent the introduction and spread of infectious diseases. Due to the diversity of egg producers and production systems, there is no one-size-fits-all approach to communicating and engaging with each sector.

Previous studies have identified how biosecurity is currently managed across the different sectors and production systems of the Australian egg industry. These studies also provided recommendations where consultation with relevant stakeholders, and working with the different segments, is required to develop the most appropriate and applicable communication and extension strategies to target each group.

This project engaged with producers from each of the different segments through a series of online workshops. The purpose of the workshops was to identify how producers from each sector obtain their information regarding biosecurity, ways to engage and further actions to improve knowledge and adoption of biosecurity practices. The extension and communication strategy for each egg sector was developed based on the information discussed during the workshop. While there are some similarities in the approaches that should be taken regarding extension and communication practices to improve biosecurity between the sectors, there is also some differences that reflect how the different sectors engage and like to receive information.

Key themes of training, utilising industry champions to share experiences, developing templates and standard operating procedures and fostering a culture of biosecurity within the workforce and a freely accessible app for online biosecurity management were identified across sectors.

In addition to these strategies, a roadmap of actions is outlined together with a document for planning authorities to assist in understanding key biosecurity considerations when new farms are developed.

# Overall Recommendations and Conclusions

There are many similarities across the different sectors of the egg industry regarding challenges and how these challenges can be addressed through enhanced communication and extension activities. However, each sector requires resources designed specifically to align to their production system.

It is recommended that the industry adopt each sector specific strategy focussing on the following areas:

- Identify key industry champions to share their experiences and include in social media, through webinars training and videos.
- Develop online biosecurity training for each sector and continue to enhance the current training resources available including emergency biosecurity procedures and drills.
- Identify a suitable biosecurity app and make this readily available for all sectors as a free app to encourage usage and enhanced traceability.
- New producers lack the knowledge of where to go for suitable information and rely on website searches. There is a need for better aligned resources for the smaller sector with better search engine optimisation so that suitable and relevant information is the first in website searches.
- Build a biosecurity culture through messaging about why biosecurity is important so that all people, staff and contractors, value the importance of biosecurity. Consistent messaging through visual reminders and managers and owners 'walking the walk' will reinforce biosecurity practices and help build a robust biosecurity culture.
- Develop a range of templates and SOPs that industry can adapt to their individual business.
- Develop and encourage local networks and peer to peer learning of the different sectors through current industry networks and discussion groups.

The benefits of implementing these biosecurity strategies extend beyond individual farms to the entire egg industry. Through collaboration and commitment, the Australian egg industry can implement and maintain high biosecurity standards that will reduce the risk of disease introduction and spread. The industry is only as strong as its weakest link.



# 1 Introduction

The biosecurity landscape in Australian egg production is complex. Farms of various sizes, structures, and production systems are common across the country, each with their own level of on-farm biosecurity practices. Emergency animal diseases such as avian influenza and food safety outbreaks continue to remain a threat, with two states (Victoria and New South Wales) currently experiencing cases of high pathogenic avian influenza. This remains a high priority area for the industry, highlighting the importance of increased biosecurity compliance.

Previous studies by Scott *et al.* (2018) and Hernandez-Jover *et al.* (2020) offer valuable insights into the adoption and perceptions of biosecurity practices among Australian poultry farmers. Scott *et al.* (2018) found that the perceived importance of and compliance with biosecurity practices were positively correlated. Most farmers recognised the importance of biosecurity, however 39% believed an avian influenza outbreak was unlikely on their farm. Factors influencing biosecurity practices included industry structure, type of ownership, and the age of the business and infrastructure. Hernandez-Jover *et al.* (2020) identified driver of biosecurity engagement and concluded that effective biosecurity engagement requires targeted communication and resources tailored to different producer types and motivations. Recommendations include reviewing biosecurity manuals for relevance, co-creating accessible biosecurity information, incorporating biosecurity practices into regulations, engaging less responsive producer groups, and utilising existing networks and media for broader outreach.

International studies conducted by Racicot *et al.* (2012) and Laconi *et al.* (2023) also offer similar insights into biosecurity compliance on poultry farms and the factors that influence it. Racicot *et al.* (2012) examined the relationship between personality traits, experience, education, and biosecurity compliance on poultry farms in Québec. The research revealed that certain personality traits, such as conscientiousness and openness to experience, were positively associated with higher levels of biosecurity compliance. Additionally, farmers with more experience and higher levels of education were more likely to adhere to biosecurity protocols. Similarly, Laconi *et al.* (2023) examined stakeholders' perceptions of biosecurity implementation in Italian poultry farms. They found that while stakeholders generally recognised the importance of biosecurity, there were significant differences in how biosecurity measures were perceived and implemented. Factors such as farm size, production system, and regional regulations influenced the adoption of biosecurity practices. The study emphasised the need for tailored biosecurity strategies that consider the unique challenges and needs of different farm types, as well as the importance of engaging all stakeholders in the development and implementation of biosecurity policies.

The shared responsibility approach for biosecurity means that it is critical that all sectors of the egg industry understand what this means and implement suitable on-farm practices. The studies conducted here and overseas highlight the similarities of biosecurity compliance and the challenges associated with achieving it. It also highlights the need for tailored biosecurity measures that consider the varying capabilities and attitudes of different poultry farmers to enhance biosecurity compliance and effectiveness across the industry.

The current project aims to build on information generated from previous research by engaging directly with egg producers from each of the different sectors to develop relevant biosecurity communication and extension strategies. This approach will ensure that the right strategies are developed for each sector. Gathering the insights of the biosecurity and food safety regulators is also vital to this process as they are at the coal face when outbreaks occur. Engaging with industry and relevant stakeholders throughout the process ensures that the developed strategies are practical, tailored to real-world conditions, and have a higher likelihood of successful implementation.

## 2 Project aims

The overarching aim of this project was to develop extension and communication strategies that focus on improving biosecurity compliance within each of the different egg sectors in Australia. To achieve this the following objectives of the project were to:

1. To engage all sectors of the industry to develop biosecurity extension and communication strategies that will target the small, medium and large segments of the Australian egg industry.
2. Develop biosecurity strategies that can be used to improve biosecurity compliance across the different sectors.
3. Develop a planning document that can be used by planning authorities regarding biosecurity requirements.

## 3 Methodology

### Phase 1

A desktop review of literature on biosecurity practices conducted on Australian egg farms was undertaken. Additionally, international papers focusing on poultry farmers' behaviour regarding biosecurity practices were reviewed. The purpose of the literature review was to identify the current knowledge regarding the attitudes and biosecurity practices of poultry producers. A stocktake of the different biosecurity resources currently available for Australian egg producers was conducted.

### Phase 2

A series of online group workshops were held with four different target groups:

- state regulators
- large scale egg producers
- medium scale egg producers
- small scale egg producers

For each group:

- A list of potential participants was developed for each group, ensuring that all states were represented.
- Group participants were confirmed with the project steering committee. The criteria for each sector was decided on by the steering committee.
- Each group entailed at least 10 people/businesses and included egg producers from each state and across production systems.
- For the regulators group, departmental officers from state government biosecurity and food safety departments, as well as the national body FSANZ, were invited.
- Invitations were sent via email to the individuals and businesses identified to be included in the online workshops.
- Final group lists are provided in Appendix 1.
- All online workshops were held in April 2024.
- Key areas covered at each workshop:
  - The current situation regarding on-farm biosecurity and food safety on-farm, including training.
  - The type of information that is currently utilised by egg producers and how they obtain their information.
  - The current biosecurity risks and challenges faced by egg producers.
  - Where improvements can be made and actions to address challenges and how improve biosecurity on-farm and for the industry.

Producers unable to attend the workshop but still interested in participating were asked if they would complete a questionnaire following the workshop. Those that agreed were sent the questionnaire via email. The questionnaire was based on the key themes discussed at the workshop and was sent to a biometrician for advice on the content and structure.

### Phase 3

Information collected during phase 1 and phase 2 was used to develop three extension and communication strategies, one for each sector; small, medium and large. Information collected from each workshop plus the questionnaire responses was summarised and formed the basis of each relevant strategy.

Each strategy focused on the following areas:

- Background and overview: highlighting the key characteristics of each sector.

- Resources utilised: highlighting the main biosecurity resources utilised for implementing biosecurity practices and training on-farm.
- Industry challenges: highlighting the challenges identified at the farm and industry level.
- Strategic actions to improve biosecurity: highlighting key actions that can be taken to address challenges to improve biosecurity knowledge and compliance.
- Timeframes for strategic biosecurity actions: highlighting immediate, short and medium term actions to progress.

A face-to face workshop was originally planned to bring together a multi-disciplinary group to review the draft strategy. This workshop did not take place, and instead the draft strategies were sent to online workshop participants requesting feedback. Any feedback was addressed and included in the strategies.

In addition to the strategies, a draft fact sheet for planning authorities was developed to highlight biosecurity considerations for planning authorities when assessing development and environmental applications for poultry farms.

# 4 The current biosecurity landscape in Australia for egg producers

## 4.1 Biosecurity and food safety legislation, regulations and standards

Egg producers across Australia are required to comply with different regulatory requirements. This can at times be confusing as the laws between states can differ particularly when it comes to food safety requirements. While not explicitly falling under biosecurity, food safety requires many biosecurity measures to mitigate risks associated with pathogens like *Salmonella*. Good biosecurity practices translate to good food safety.

The following briefly outlines the biosecurity and food safety requirements for egg producers each state. The legislation search tool for poultry also has links directly to the relevant state legislation. <https://chicken-meat-extension-agrifutures.com.au/poultry-legislation-search-tool/>

### National

- All egg producers must comply with the Food Standards Australia New Zealand (FSANZ) Standard 4.2.5 – Primary production and processing standard for eggs and egg product.
- AUSVETPLAN is in place for responding to emergency animal disease incidents in Australia.
- Egg Standards Australia (ESA) is a voluntary quality assurance program that demonstrates compliance with egg production standards, including biosecurity.

### Victoria

- A property identification code (PIC) is required for properties that have 50 or more birds.
- A food safety Management Statement (FSMS) is required for egg producers with 50 or more birds.

### New South Wales

- A PIC is required for properties with 100 or more poultry birds.
- All egg producers have a general biosecurity duty under the NSW Biosecurity Act.
- Egg producers must meet the requirements of the *Salmonella* Enteritidis control order.
- Licensing is required for egg producers supplying more than 20 dozen eggs per week.

### Queensland

- A PIC is required for all properties with 100 or more birds and the property registered as a Registered biosecurity entity (RBE).
- All producers that supply eggs must be accredited and have a documented food safety management plan.
- Newcastle disease vaccination is required for all laying hens in Queensland.
- All egg producers have a general biosecurity obligation under the Queensland Biosecurity Act to manage biosecurity risks.

### Western Australia

- A PIC is required for all properties with 100 or more birds.
- All egg producers must have a FSMS to demonstrate how they comply with the FSANZ standard 4.2.5.

### South Australia

- Under the food standards, producers with more than 50 birds must be accredited.

- All producers selling to a food business must be accredited regardless of the number of birds.
- Commercial egg producers who require a food safety accreditation also must have a PIC.

#### Tasmania

- Egg producer with less than 50 birds and producing less than 20 dozen eggs per week do not need to be accredited, however they do need to formally register their activity with Biosecurity Tasmania. A FSMS is encouraged.
- Commercial egg producers (with more than 50 birds and producing over 20 dozen eggs per week) require full accreditation as a primary producer and have an approved food safety program in place.

## 4.2 Biosecurity resources

Biosecurity activities, materials and resources for egg producers in Australia are essential components of communication and extension. The state and federal government departments, along with Australian Eggs, provide a range of videos, tools, training and on-farm resources to assist egg producers implement effective on-farm biosecurity measures. These resources are designed to educate and support producers in adopting best practices for biosecurity, from simple visitor entry procedures through to high level biosecurity and what to do in the event of an emergency disease.

In addition to written resources such as fact sheets, reports, manuals, posters and templates, egg producers can also access training resources to enhance their biosecurity knowledge and skills such as videos, online tools and face-to-face accredited courses in poultry production. Industry organisations and government departments offer workshops, webinars, forums and online courses covering various aspects of biosecurity management and emergency animal disease preparedness.

Technology also plays a crucial role in modern biosecurity management for egg producers. Various digital apps are now available to streamline record keeping and traceability for movement on, and off the farm, however the uptake of these tools has been varied and is not currently widespread across the industry.

The list of resources available is quite extensive (Appendix 2). Despite the abundance of resources, not all sectors readily utilise this information to implement effective biosecurity measures. Differences in the size and scale of operations can influence how these resources are used, as well as length of time in the industry. Smaller producers may face challenges such as limited knowledge of what information is available, access to training or financial constraints, while larger operations may have challenges with staff and contractor compliance.

## 4.3 Engagement with egg producers

The Australian egg industry has a diverse range of knowledge and skills within their egg producers across the different segments. Due to this diversity, there is no one-size-fits-all approach to engaging with each of these sectors. This is of particular importance given the different backgrounds, ideals, skill and knowledge levels that exist across Australia's egg industry.

There are various ways in which egg producers are engaged through different initiatives and activities. A range of engagement activities for poultry producers and industry occur across each state from government, state and national industry bodies, poultry associations and Australian Eggs. These activities focus on various topics that vary from production, welfare and environmental sustainability to biosecurity and food safety.

In addition to the range of resources a summary of the activities include:

### Webinars

- Quarterly webinars are held by Australian Eggs on current research projects are topics of industry interest.
- State government departments hold ad hoc webinars on different topics for different audiences, for example biosecurity, local councils.

### Poultry Health Liaison Groups

- Each state agricultural department hold meetings twice yearly with veterinarians, government, research and key industry people about biosecurity relevant information.

### State based industry forums, meetings and workshops

- Commercial egg producer associations have member meetings in each state.
- World Poultry Science Association – states with active sub-branches hold industry forums for members and industry.
- Australian Eggs holds regular forums and workshops each year for all poultry producers.
- State based egg consultative committee meetings and egg industry engagement meetings.

### Food safety authorities

- Conduct regular audits with accredited businesses.
- Education provided to support new producers that become accredited.
- Engage directly with new egg producing businesses to regular updates.

### Social media and online

- Social media presence through Facebook, LinkedIn and Instagram.
- Regular subscription newsletters.
- Each state government has relevant websites and hotlines for biosecurity and food safety.
- Small-scale free range community of practice and website.
- Australian Eggs is currently developing induction resources.
- Virtual reality tool on biosecurity is available online.

### Extension services

- Some state departments have extension services for egg producers that provide direct contact with egg producer enquiries.
- Farm visits, field days and producer discussion groups.
- Direct email and SMS communication.



# 5 Strengthening Biosecurity: Extension and Communication Strategies

## 5.1 Large scale egg farms

### Overview

The Australian egg industry is diverse. Eggs are a low-cost, high quality protein source, with per capita consumption increasing steadily each year. However, the production of eggs is not without its challenges. Infectious diseases pose a constant threat and the impacts of outbreaks such as avian influenza and *Salmonella* Enteritidis can be devastating to individual farms and to the entire industry.

Biosecurity plays a pivotal role in safeguarding the health, welfare, and productivity of commercial egg production in Australia. Developing and implementing a comprehensive biosecurity extension strategy is essential to address the challenges faced by industry and ensure the sector's sustainability.

This strategy for large-scale egg farms focuses on maintaining robust biosecurity measures to protect poultry health, ensure farm profitability, and meet regulatory requirements. This document outlines the current situation and key challenges, together with identified actions for industry to progress to improve the biosecurity compliance.

### Background and context

The large egg production sector in Australia comprises of a small number of companies that contribute significantly to the total number of eggs produced nationally each year. It is characterised by its advanced infrastructure and comprehensive management systems. This sector is distinguished by several key characteristics that set it apart from other segments of the poultry industry.

#### *Vertical integration and modern infrastructure*

One of the defining features of large-scale egg farms is their vertically integrated production systems. This approach encompasses all stages of production, from breeding and hatching to feed production and egg processing. Vertical integration allows for greater control over the entire supply chain, enhancing efficiency and ensuring consistent quality. Farms in this sector often operate multiple production systems, including cage, barn, and free-range, allowing them to meet diverse market demands and consumer preferences.

Large egg farms typically have modern infrastructure designed to optimise productivity and biosecurity. Advanced housing systems equipped with climate control, automated feeding, and egg collection systems are common. This infrastructure not only maximizes efficiency but also supports high standards of animal welfare.

#### *Scale and specialisation*

Large egg farms in Australia are defined by their scale, typically housing more than 150,000 laying hens. This scale requires a high degree of specialisation and these farms often employ specialised veterinarians to oversee the health and welfare of poultry, ensuring biosecurity measures are effectively implemented, and that any health issues are quickly addressed.

#### *Comprehensive biosecurity systems*

Large-scale farms implement a range of biosecurity measures, including:

- Training and education: All personnel, including long-term staff, contractors, and casual workers, receive thorough training in biosecurity protocols. This training is regularly updated to reflect the latest industry standards and disease risks. Training is usually developed in-

house incorporating external material from industry manuals and guidelines or provided through external training providers.

- Quality assurance systems: These farms have robust quality assurance and traceability systems in place, ensuring that every aspect of production meets stringent standards.
- System-wide risk mitigation: By systematically identifying, managing, and continuously improving biosecurity practices, farms can effectively mitigate risks and maintain operational and financial security.
- Access control: Access to production areas is strictly limited to authorised personnel, with some farms requesting showering of staff prior to access. Visitor access requires strict protocol is followed by those granted access.
- Pest control and waste management: Effective pest control and waste management systems are critical components of biosecurity.
- Water quality testing: Regular testing of water sources ensures that they remain free from contaminants that could harm poultry health.
- Personal protective equipment (PPE): The use of PPE, such as on-farm only protective clothing and footwear, is provided to prevent the transfer of pathogens.
- Record keeping and traceability: practices in place to trace product, vehicle and people movement.
- Fencing and signage: Farms are well fenced, with gated entry and have appropriate biosecurity signage in place at strategic locations across the farm.

### **Resources utilised**

The large egg sector accesses biosecurity information from various channels including Australian Eggs, industry bodies and government agencies. The information within these resources is often utilised to enhance individual business training activities to ensure high standards of on-farm biosecurity.

- Australian Eggs: Information available on their website plays an integral role in providing resources such as manuals, training materials, posters, and guidelines. Australian Eggs organises forums, workshops, and training courses that facilitate information sharing and best practices across the industry.
- State and federal governments: Government agencies offer updates and regulations pertinent to biosecurity practices. These bodies often collaborate with industry stakeholders to develop comprehensive biosecurity frameworks and relevant training for emergency animal disease responses.
- International sources: Learning from international experiences is crucial, especially regarding diseases like avian influenza.
- Veterinary consultants: Both company veterinarians and external consultants are integral to sourcing the latest biosecurity advice and scientific research. Regular consultations ensure that farms remain compliant with best practices and can swiftly implement new measures as needed.
- Active industry engagement: Large egg farms actively engage with the broader industry, participating in forums, seminars, and conferences. This engagement allows them to stay abreast of the latest research and developments in poultry health, nutrition, and biosecurity. Collaboration with veterinarians and researchers ensures that these farms adopt best practices and innovative solutions to emerging challenges.

### **Industry challenges**

Despite the strengths that this sector has, the large egg farms also face several challenges.

1. Staff turnover: High turnover rates necessitate continuous training, risking gaps in biosecurity adherence. Less experienced workers may not fully grasp the importance of biosecurity measures.
2. Reactionary approach: The industry often responds to issues post-occurrence rather than preventing them proactively.
3. Compliance of biosecurity protocols: Ensuring that staff, contractors and external providers adhere to biosecurity protocols is challenging. Even with extensive training and monitoring, there's a need to trust that employees and contractors are following correct protocols and not avoiding required biosecurity practices.
4. Inconsistent biosecurity views: Varied understanding and prioritisation of biosecurity among stakeholders can undermine efforts. Importance of fostering a mindset where everyone continuously thinks about and prioritises biosecurity. Non-compliance, even by a single individual, can compromise the entire biosecurity chain.
5. Understanding the 'Why': Ensuring that staff and contractors understand the critical reasons behind biosecurity measures is a continuous challenge. Lack of understanding can lead to lapses in following protocols. Contractors may have less at stake, making them less motivated to comply.
6. Free range and pest control: Maintaining biosecurity in free-range systems is particularly challenging, with issues with controlling pests like rodents and wild birds. Regulatory restrictions on pest control measures, such as rodenticides, further complicate the situation.
7. Product registrations: Compliance with external regulations, such as vaccination and product registrations, adds complexity and cost. There is a risk of losing some important vaccines and products from the market.

### **Strategic actions to improve biosecurity**

Improving biosecurity in the large egg production sector requires innovative and targeted strategies. Several opportunities exist to enhance biosecurity practices, increase awareness, and ensure compliance across all levels of the industry.

#### *Develop standardised standard operating procedures (SOPs)*

Creating a standardised set of biosecurity SOPs and work instructions will provide a clear set of on-farm biosecurity practices that can be adapted for individual farms across all industry sectors. These SOPs should cover all essential aspects of biosecurity, from access control and hygiene protocols to disease monitoring and emergency response plans. By providing a common framework, these SOPs will ensure that all farms, regardless of size or production system, adhere to consistent and effective biosecurity measures.

#### *Conduct more specialised on-farm training*

Hands-on training is important for farm staff. Regular on-farm training sessions focused on key areas such as rodent management and shed disinfection as examples will help staff understand the practical aspects of biosecurity. These training sessions should be interactive, allowing staff to ask questions and practice techniques under the guidance of experienced trainers. These resources should incorporate external materials, such as those provided by Australian Eggs, to ensure that the latest industry standards and practices are included. By customising these materials, farms can address unique challenges and scenarios specific to their operations, making the training more relevant and effective for their staff.

#### *Conduct regular on-farm biosecurity drills*

Biosecurity drills simulate real-life scenarios to test and reinforce the biosecurity measures in place. Conducting regular drills ensures that all staff are familiar with the procedures they need to follow in the event of a disease outbreak or other biosecurity threat. These drills can highlight areas where

procedures may be unclear or insufficient, allowing for timely adjustments and improvements. By making biosecurity drills a routine part of farm operations, farms can ensure that staff are always prepared and responsive to biosecurity challenges.

#### *Develop real-life case studies with 'industry champions'*

Sharing real-life case studies from farms and individuals that have successfully managed disease outbreaks can be a powerful educational tool. Industry champions who have firsthand experience with the implications of disease can provide valuable insights and lessons learned. These case studies should detail the steps taken to manage and overcome the outbreaks, the challenges faced, and the long-term benefits of robust biosecurity practices. Hearing from peers can resonate more strongly with farm staff and management, driving home the importance of strict biosecurity measures.

#### *Develop clear 'Why's' on the importance of biosecurity*

Ensuring that all staff understand the reasons behind biosecurity measures is vital for fostering a culture of compliance. Developing clear explanations and rationale – the 'why's' – for each biosecurity practice will help staff appreciate their importance. These explanations should be communicated through training sessions, signage, and regular meetings. When staff understand how their actions directly impact the health of the flock, the profitability of the farm and the security of their job, they are more likely to adhere to biosecurity protocols diligently.

#### *Training on the implications of international outbreaks*

Providing specific training on the implications of international disease outbreaks helps farm staff understand the potential risks and necessary precautions. Engaging subject matter experts can offer advanced knowledge and insights into biosecurity practices, learning from international experiences and equipping industry with the skills needed to enforce compliance and address challenges proactively. Staying informed about international biosecurity threats is critical for proactive and effective risk management.

#### *Link with other industries for biosecurity research and extension*

Collaboration with other agricultural sectors and livestock industries can provide valuable insights and resources for biosecurity research and extension. By sharing knowledge and best practices, the egg production sector can benefit from advances and innovations in biosecurity that other industries have already developed. This collaborative approach prevents duplication of effort and accelerates the adoption of effective biosecurity strategies. Joint research projects and cross-industry workshops can be particularly beneficial for addressing common biosecurity challenges.

#### *Utilise state-based groups to build local networks*

State-based groups and associations can play a pivotal role in disseminating biosecurity information and fostering local networks. These groups can organise workshops, training sessions, and information-sharing meetings that are tailored to the specific needs and challenges of local farms. Building strong local networks ensures that biosecurity information and resources are readily accessible, and it promotes a sense of community and shared responsibility amongst all sized sectors.

#### *Have a free biosecurity app available for the Industry*

A dedicated biosecurity app can be an invaluable tool for increasing compliance and awareness across the industry. The app could be trialled and tested as suitable, then made freely available to all egg producers. Making the app free and widely available ensures that all farms, regardless of size, can benefit from these resources.

#### *Additional practical resources to supplement industry forums and workshops*

Develop written materials and visual aids such as videos and webinars in tandem with industry forums and workshops to provide a comprehensive learning experience. Providing practical take-home resources that can be implemented immediately on-farm improves the ease at which the

information is adopted at the farm level.

#### *Translated materials*

Many farms have employees where English is a second language. To ensure that all employees fully understand biosecurity protocols, key documents and training materials should be translated into relevant languages. This approach helps bridge language gaps and ensures all staff can access and comprehend essential information. Additionally, implementing a buddy system that pairs new employees with experienced staff who speak the same language can provide hands-on guidance and support, reinforcing the training and improving compliance.

#### **Timeframes for strategic biosecurity actions**

The following priority areas were identified for immediate action:

- Utilise 'industry champions' to start emphasising the importance of biosecurity: Key people identified. Their experience and insights can be shared through various platforms such as industry forums, webinars and videos.
- Implement biosecurity apps: Identify a suitable app that has been trialled across the industry and subsidise the cost so that it is free of charge for industry wide uptake.
- Develop a set of standardised biosecurity SOPs: These can streamline biosecurity practices, making it easier for farms to maintain consistent standards and traceability.
- Develop more on-farm practical training with farm staff: Having external providers deliver practical information on-farm can enhance the message.
- Continue state-specific biosecurity exercises: State-based biosecurity exercises driven as a collaboration between government and industry are essential to maintain key relationships. Having examples tailored to address the unique challenges and requirements of different farming systems is vital so that all parties are adequately prepared to handle local biosecurity threats.

#### **Short to medium term (1-5 years) priorities**

- Enhance industry forums with take-home tools: Develop and distribute take-home practical information that supplements the industry forums. Making these resources widely available and communicated ensures all farm staff can access and benefit from them.
- Increased visibility of online tools and resources: Increase efforts to increase the visibility and accessibility of online biosecurity tools and resources. This can involve improving website usability, optimizing search engine visibility, and promoting these resources through industry newsletters and social media channels.
- Build local networks within states: Encourage state based groups to form and meet regularly to share information and to foster stronger linkages and communication between producers.
- Conduct regular biosecurity drills: Develop a set of protocols that all farms could adopt or adapt so that it is relevant for their business.

These efforts collectively aim to shift biosecurity from a reactionary to a preventative approach, ensuring that all stakeholders are educated, engaged, and equipped to maintain high biosecurity standards. By pursuing these opportunities, the large egg production sector can significantly enhance its biosecurity practices, safeguarding poultry health and ensuring the sustainability and profitability of the industry.

## 5.2 Medium sized egg farms

### Overview

Biosecurity plays a pivotal role in safeguarding the health, welfare, and productivity of commercial egg flocks in Australia. Maintaining rigorous biosecurity measures is essential to mitigate the risk of disease outbreaks, protect animal welfare, and ensure the long-term viability of the egg industry. Developing and implementing a comprehensive biosecurity extension strategy is needed to address the challenges faced by industry and ensure the sector's sustainability.

This extension strategy aims to enhance biosecurity compliance and mitigate risks, ultimately ensuring the sustainability and profitability of these farms. The strategy focuses on leveraging resources, addressing industry challenges, and implementing strategic actions to improve biosecurity practices across the sector.

### Background

The medium-sized egg sector is characterised by flocks ranging from 40,000 to 150,000 hens and often operate with small staff numbers. This sector recognises the importance of biosecurity and that it is critical for business continuity and will often rely on external consultants, such as veterinarians, for biosecurity advice. Due to relatively small hen numbers compared to larger egg laying companies, these farms will often have multi-aged flocks which presents its own unique biosecurity challenges.

These farms are likely to use external contractors for essential services like feed supply and vaccination. Some farms will rear their own pullets and have staff trained to provide vaccinations to minimise risks associated with shared suppliers.

The medium sector keeps records for traceability, however regular auditing can be an added expense that is not always practical for farms of this size. Online apps and QR codes have been trialled for online biosecurity logs and movement, however implementation can be challenging.

Training mostly consists of induction training of new staff, which includes biosecurity. Ongoing training is usually less structured due to smaller teams where regular discussions and reminders occur during daily interactions or at team meetings. Contractors are required to follow biosecurity procedures while on farm.

### Resources utilised

The key areas where information is sourced includes:

- Australian Eggs website: This is a primary resource for comprehensive biosecurity information, guidelines, and manuals, such as the Healthy Hens manual and different posters. Great resources, however their effectiveness can wane over time due to complacency.
- State government departments: Each state provides relevant information regarding state specific biosecurity and food safety regulations.
- Veterinary experts: Not all medium sized egg businesses have the ability to employ a vet on staff, so will rely on contacting external poultry veterinary experts for specialised advice and verification of information.
- National Farm Biosecurity Manual: A government resource providing detailed biosecurity guidelines for farmers.
- Experience and networking: Many medium sized egg farms have been in the egg business for a long time. They utilise personal experience and industry connections to stay informed about biosecurity practices and developments.

### Industry challenges

Medium-sized egg farms faces several biosecurity challenges that can significantly impact farming operations and overall biosecurity compliance. These challenges include:

1. **Cost implications:** Implementing comprehensive biosecurity measures can be costly. For medium-sized farms, these costs can sometimes seem disproportionate to the perceived risks, especially in a relatively disease-free country like Australia. The financial burden can be a deterrent, leading some farms to compromise on biosecurity measures, thereby increasing vulnerability to disease outbreaks. The high costs for high level biosecurity measures disproportionately affects smaller producers, creating potential competitive disadvantages and economic barriers.
2. **Shared suppliers:** Medium-sized farms often rely on shared suppliers for essential services and resources, such as feed and vaccination crews. This reliance increases the risk of disease transmission. Shared suppliers may service multiple farms, and any lapse in biosecurity at one location can have cascading effects on others. For instance, contaminated feed or improperly vaccinated pullets can introduce pathogens to a previously healthy flock, leading to significant health and economic repercussions. The interconnectedness of farms through common suppliers requires strict biosecurity protocols across the supply chain, which can be challenging to enforce.
3. **Egg trading:** Trading eggs with other farms presents a biosecurity risk. Without proper handling and biosecurity measures in place, trading can facilitate the spread of diseases between farms. Ensuring that trading partners adhere to rigorous biosecurity standards is crucial. However, inconsistencies in biosecurity practices and regulatory requirements across state jurisdictions and trading partners can complicate efforts, making biosecurity more challenging.
4. **People movement:** Family-run farms are common in medium-sized farms, which can often see a higher degree of movement on and off the farm with inconsistency of biosecurity practices being followed as family members and staff go about their daily activities. This constant movement increases the likelihood of inadvertent contamination.
5. **Staff complacency:** Maintaining high levels of biosecurity compliance among staff is essential but challenging. Over time, staff can become complacent, especially if the farm has not experienced a recent disease outbreak. This complacency can lead to lapses in biosecurity protocols. Continuous training, regular reminders, and fostering a culture of biosecurity are necessary to combat complacency.
6. **Vaccination of pullets:** Medium-sized farms often face challenges in maintaining consistent and effective vaccination practices. This can be due to reliance on external vaccination crews who may not follow the farm's biosecurity protocols. Concerns about the transparency of suppliers, especially regarding vaccination and health status of flocks. Inadequately vaccinated pullets can become vectors for disease, posing a significant threat to the health of the entire flock.
7. **Free range farming practices:** Free-range farming requires a different approach to biosecurity compared to other farming systems, which sometimes leads to inconsistencies in audits and control measures. For example: having small gaps in shed walls is unacceptable in barn systems as it can let rodents in, but the large pop holes in free range systems is acceptable even though rodents and other pests have easy access into the barn. Wild birds can carry diseases like avian influenza, which can easily spread to domestic flocks through direct contact with poultry or through contaminated feed and water sources. Rodents and insects can harbor and spread a variety of pathogens, including *Salmonella*.

#### **Strategic actions to improve biosecurity**

To address these challenges and improve biosecurity compliance, the following strategic actions are

proposed:

#### *Creating a biosecurity culture amongst staff – ‘Walking the walk’*

Creating a biosecurity culture among staff is fundamental to ensure that biosecurity measures are consistently implemented and maintained. This involves more than just setting rules and protocols; it requires fostering an environment where every staff member understands the importance of biosecurity and is committed to upholding it in their daily tasks.

A biosecurity culture begins with farm managers and supervisors leading by example, consistently demonstrating good biosecurity practices and emphasizing their importance in meetings and training sessions. This approach ensures that biosecurity is not seen as an occasional requirement but as an integral part of the farm's operation.

Regular training sessions and workshops can reinforce this culture, providing staff with up-to-date information on biosecurity threats and best practices. Additionally, recognising and rewarding staff who consistently follow biosecurity protocols can motivate others to do the same. Creating a sense of collective responsibility and pride in maintaining high biosecurity standards is key to embedding these practices deeply into the farm's operational culture.

#### *Training for all levels of staff*

Comprehensive training programs for staff should cover all aspects of biosecurity, from recognising potential threats to implementing preventive measures and responding to biosecurity breaches. These programs should be designed to cater to different learning styles, incorporating visual aids, hands-on demonstrations, and written materials.

Use external experts for training to provide additional insights and reinforce the importance of biosecurity. Training can also be tailored to specific roles within the farm, ensuring that everyone, from managers to farm hands, understand their responsibilities in maintaining biosecurity.

#### *Developing templates for standard biosecurity requirements*

Developing templates for standard biosecurity requirements that can be used across all businesses in the egg sector ensures consistency and simplifies the implementation of biosecurity measures. These templates should cover a range of biosecurity practices, including protocols for cleaning and disinfection, pest control, visitor management, and emergency response.

Standard templates make it easier for farms to comply with best practices. They can also be customised to address specific needs or challenges of individual farms while maintaining core standards. This approach helps to create cohesive and consistent biosecurity practices across the industry.

Having standardised templates reduces the burden on individual farms to develop their own protocols from scratch, allowing them to focus on implementation and compliance. It can also make internal auditing and monitoring of biosecurity practices easier.

#### *Industry collaboration*

In the egg production industry, trading eggs directly between farms can introduce significant biosecurity risks, as it facilitates the movement of potential pathogens. To mitigate these risks, developing centralised systems or clearinghouses for egg trading can be a strategic solution. These centralised hubs reduce the need for direct farm-to-farm interactions and minimise the likelihood of disease transmission.

#### *Cost management*

Find ways to make biosecurity measures affordable and practical for medium sized producers to



ensure widespread implementation. Focus on implementing cost-effective biosecurity measures that small businesses can afford and consider a tiered approach to biosecurity based on risk levels. For example: balancing the cost of audits and certifications to ensure farms of all sizes can maintain high biosecurity standards.

#### *Improved traceability of eggs – Consistency in state requirements for egg stamping*

Improving the traceability of eggs once they leave the farm is crucial for managing biosecurity risks and ensuring food safety. One effective method is implementing consistent state requirements for egg stamping, which helps track eggs from their origin to the point of sale. This consistency across states ensures that eggs can be reliably traced back to their source when required.

#### **Timeframes for strategic biosecurity actions**

The following priority areas were identified for immediate action:

- Creating a biosecurity culture amongst staff: 'Walking the walk' means embedding biosecurity principles into the daily routines and mindset of every employee, ensuring that biosecurity measures are not just guidelines but integral to farm operations. Establish clear communication regarding the importance of biosecurity to staff.
- Develop templates for standard biosecurity requirements: Standard operating procedures can streamline biosecurity practices, making it easier for farms to maintain consistent standards and traceability.
- Implement an industry wide biosecurity app: Identify a suitable app that has been trialed across the industry and subsidise the cost so that it is free of charge for industry wide uptake.
- Develop more on-farm practical training with farm staff: Have external providers deliver practical information on-farm to enhance the message.

#### **Short to medium term (1-5 year) priorities**

- Develop cost benefit analysis of the different biosecurity practices: For medium-sized egg farms, implementing biosecurity measures can be a costly exercise. However, a comprehensive cost-benefit analysis can help identify the most cost-effective practices, ensuring that farms achieve optimal biosecurity without undue financial strain. Farms can make informed decisions about biosecurity investments, ensuring that resources are allocated effectively to protect poultry health and sustain farm operations.
- Develop transparency in vaccination protocols and reporting mechanisms: Transparency helps build trust among stakeholders, including staff, suppliers, and regulatory bodies, by providing clear and accessible information about vaccination practices.
- Consistency in state requirements for egg stamping: Identify opportunities for state authorities to work together so that stamping requirements are consistent and traceable across state boundaries.

These strategic actions collectively aim to strengthen biosecurity compliance, with actions that can be addressed at all levels – at the farm, by industry and also by government.

## 5.3 Small scale egg farms

### Background

The Australian egg industry comprises various sectors that produce eggs in different production systems and sized farming enterprises. Small scale egg producers are key contributors to the industry, providing niche markets and smaller retailers with high-quality, locally produced eggs. Typically operating with flocks ranging from 1,000 to 40,000 hens, these eggs are often produced in pastured and free-range systems, prioritising animal welfare and sustainable practices. Unlike larger operations, small egg producers do not usually engage consultant advisors or specialist veterinarians, relying on publicly available information to make effective biosecurity decisions.

A distinctive feature of small egg producers is their strong desire to connect directly with their customers. This direct engagement is often achieved through social media platforms and farm tours, which allow consumers to experience how eggs are produced. These interactions not only build trust and loyalty but also provide an invaluable opportunity for education and transparency about their farming practices. However, the close interaction with the public also requires strict biosecurity measures to prevent the introduction and spread of disease and food safety pathogens.

By addressing the specific needs and challenges of the small egg production sector, this biosecurity extension strategy aims to safeguard flock health, enhance consumer confidence, and ensure the sustainability of small egg producers. Through education, community engagement, resource development, support networks, and ongoing monitoring, small egg producers can achieve a high standard of biosecurity, protecting both their livelihoods and the broader poultry industry.

### Resources utilised

The small egg sector relies on getting their information mostly from online sources and from other like-minded producers. It can be difficult for people entering the industry to find relevant information. As it is not always easy for smaller landholders to locate relevant information, unfortunately it can be when things go wrong that biosecurity becomes increasingly important.

The main sources of information include:

- Online resources: Google searches to find relevant biosecurity documents and guidelines specific to egg production.
- State government websites: The main websites used for information and resources relating to biosecurity, general poultry production, food safety reference documents and guidelines are state government departments. Planning and environmental information is accessed from local government bodies to understand regulations and compliance requirements.
- Peer-to-peer learning: Learning from other producers and sharing information through informal networks.
- Industry webinars and conferences: Regular participation in industry-specific webinars and conferences helps to stay updated with the current information. However, most forums have all sized enterprises present and questions are rarely asked.

### Training

Training varies farm to farm and is based on the experience of the producer. In general, induction training takes place that includes information regarding biosecurity and the expectations of staff members. While there is training conducted on-farm specifically regarding biosecurity procedures, it was widely acknowledged that poultry specific online training would be seen as positive.

Examples of the training conducted with staff include:

- All staff are trained on the farm's biosecurity plan using the Australian egg biosecurity manual as a reference.

- New staff members undergo a thorough induction process, which includes reading through the farm's biosecurity rules and regulations, of which they must agree to abide by.
- New staff must read and understand the farm food safety procedures. This is to ensure staff are aware of and compliant with biosecurity practices, holding the farm to its integrity and opening communication channels with staff.
- Farm owners or managers are generally present when staff are on-site to supervise and ensure protocols are followed. This hands-on approach helps maintain high biosecurity standards.
- Ongoing training and communication:
  - Regular staff meetings (weekly or fortnightly) are held to discuss any biosecurity issues or updates. This consistent communication ensures staff remain aware of biosecurity importance and current protocols.

### **Industry challenges**

While there are some similarities across the industry, each production system and sector does have its unique challenges. Some of the main challenges faced by the small sector regarding biosecurity include:

1. **Wildlife and pest control:** One of the most significant challenges is managing the impact of wild birds and animals, such as cats. Wildlife and pests such as rodents can travel long distances, introduce and spread disease.
2. **Shared suppliers and consistency in biosecurity practices among suppliers:** The use of shared delivery vehicles and ensuring that suppliers consistently follow biosecurity protocols poses a considerable risk. Even with clear requirements in place, the adherence to these practices by suppliers and their personnel remains a variable outside direct farm control. Producers can request compliance, however, verifying that delivery drivers and suppliers follow through is difficult.
3. **Staff compliance:** Trusting staff to follow biosecurity rules diligently is another major concern. There is always a risk that employees might not adhere to protocols strictly, especially if they are unwell but still report to work. Ensuring staff fully understand and commit to biosecurity practices is crucial.
4. **Public access and interaction:** Having farm tours and farm shops brings its own challenges. Visitors may inadvertently bring contaminants into designated biosecure areas and not respect farm protocol. Designating specific areas and restricting staff movement between secure farm areas are important measures.
5. **Lack of information for start-ups:** Many new entrants lack the understanding of biosecurity as information relevant to them is not readily available.
6. **Technology barriers:** Connectivity issues may hinder the adoption of technology suited to biosecurity for enhanced biosecurity and improved traceability.

### **Strategic actions to improve biosecurity**

Addressing these challenges requires an approach that includes improving biosecurity culture among staff, enhanced information access and biosecurity training.

#### *Improved communication and support*

Implement regular updates from biosecurity authorities and industry bodies. This is a proactive way to help producers stay informed. These can be provided online through webinars, or face-to-face and conducted quarterly.

#### *Enhanced information access*

Creating a centralised online repository with comprehensive biosecurity guidelines and resources specifically for small-scale egg producers. Content tailored specifically to the needs and challenges faced by the sector, with links to relevant tools, resources and contacts that producers can utilise.

Improved search engine optimisation for free range farming information will make it easier to find when new entrants are conducting online searches.

#### *Develop comprehensive biosecurity training module*

Training should cover all aspects of biosecurity, from recognising potential threats to implementing preventive measures and responding to biosecurity breaches. These programs should be designed to cater to different learning styles, incorporating visual aids and written materials. Preferably this training could be made available on-line for people to access at times convenient to them.

The module should be easily accessible and comprehensive, covering both theoretical knowledge and practical application. It should also include what to expect if a notifiable disease is detected on your property. Training can also be tailored to specific roles within the farm, ensuring that everyone, from managers to farm hands, understand their responsibilities in maintaining biosecurity.

#### *Templates for standard biosecurity requirements*

Develop templates for standard biosecurity requirements applicable for all areas of the egg business. This will ensure consistency and simplify the implementation of biosecurity measures, making it easier for farms to comply with best practices. Templates can cover a range of biosecurity practices, including protocols for cleaning and disinfection, pest control, visitor management, and emergency response. Templates can also be customised to address specific needs or challenges of individual farms while maintaining core standards.

Having standardised templates also reduces the burden on individual farms to develop their own protocols from scratch, allowing them to focus on implementation and compliance. It also facilitates easier internal auditing and monitoring of biosecurity practices.

#### *Better onboarding for new entrants*

Develop and provide new entrants with detailed information starter-kits that includes all necessary information and guidelines for setting up and maintaining biosecurity and food safety standards. This should include the full understanding of some of the greatest risks to an enterprise, including *Salmonella* Enteritidis. Many small producers learn through trial and error, which can be costly and inefficient. A structured support system, including mentorship and accessible resources, would help new producers integrate more smoothly and adopt best practices from the beginning.

#### *Collaborative platforms*

Develop opportunities for peer networks and discussion groups to facilitate continuous learning and mutual support among poultry producers. By participating in these groups, producers gain valuable information that helps them strengthen their biosecurity protocols and respond effectively to emerging challenges. Additionally, enhanced peer-to-peer learning initiatives focus on forming groups of similar-sized producers. These groups provide platforms for exchanging practical experiences, addressing common challenges, and sharing solutions.

#### *Develop case studies with 'industry champions'*

Sharing real-life case studies from farms and individuals that have successfully managed disease outbreaks can be a powerful educational tool. Industry champions who have firsthand experience with the implications of disease can provide valuable insights and lessons learned. These case studies should detail the steps taken to manage and overcome the outbreaks, the challenges faced, and the long-term benefits of robust biosecurity practices. Hearing from peers can resonate more strongly with farm staff and management, driving home the importance of strict biosecurity measures.

#### *Consistency in state requirements for food safety and biosecurity*

This should cover all areas of the supply chain including pullet suppliers and feed delivery. There is currently inconsistency regarding the requirements of different businesses that are a critical

component of the supply chain. Consistent requirements across states eliminate discrepancies and confusion that could arise from varying regulations, thereby streamlining the traceability process and enhancing overall biosecurity.

#### **Timeframes for strategic biosecurity actions**

The following priority areas were identified for immediate action:

- Regular industry updates: Conduct quarterly updates with biosecurity authorities and industry bodies to help producers stay informed.
- Develop templates for standard biosecurity requirements: Standard biosecurity templates can streamline biosecurity practices, making it easier for farms to maintain consistent standards.
- Develop online biosecurity training module: An online training resource for all sectors of the egg industry would be well utilised.
- Enhance information access: Increase efforts to increase the visibility and accessibility of online biosecurity tools and resources into a centralised online repository. The Small-scale free range poultry community of practice is an example of where this could be located.
- Utilise 'industry champions' to start emphasising the importance of biosecurity. Identify key people so experience and insights can be shared through various platforms such as industry forums, webinars and videos.

#### **Short to medium term (1-5 years) priorities**

- Develop starter-kits for new entrants to the industry: A comprehensive biosecurity starter kit would be beneficial for people new to the industry.
- Collaborative platforms: Develop opportunities for peer networks, discussion groups and cross-industry collaboration to facilitate continuous learning.
- Consistency in state requirements: Identify opportunities for state authorities to work together so that biosecurity requirements are consistent and traceable across the supply chain and state boundaries.
- Build local networks within states: Encourage state based groups to form and meet regularly to share information and to foster stronger linkages and communication between producers.

#### **Long-term ideas to progress:**

- **Vaccination and compensation policies:** There is interest to progress options that investigate allowing vaccination for enhanced disease prevention, particularly for addressing threats like Salmonella Enteritidis (SE) and Highly Pathogenic Avian Influenza (HPAI). Investigate options for compensation for *Salmonella* Enteritidis outbreaks on farm that are not deemed 'at-fault'. Currently compensation only exists for other exotic disease such as avian influenza.

While this does not sit specifically within the remit of an extension strategy, this is an extra layer of protection that this sector of the industry is interested in pursuing.

By addressing the specific needs and challenges of the small egg production sector, this biosecurity extension strategy aims to safeguard flock health, enhance knowledge, and ensure the sustainability of small egg producers. Through education, community engagement, resource development and support networks, small egg producers can achieve a high standard of biosecurity, protecting both their livelihoods and the broader poultry industry.

## 6 Roadmap to implement strategies

Each sector has identified the key actions to progress towards improved on-farm biosecurity compliance that will require input from all sectors of the industry. While there are some differences in how to address the biosecurity challenges faced by the industry, there are also similarities across the different sectors. Regardless of farm size, one commonality amongst all egg producers is their genuine concern for the health and welfare of their hens. All producers, whether managing a small family farm or a large commercial enterprise, share a commitment to doing the right thing for their flocks. This shared dedication provides a strong foundation for the adoption of biosecurity measures across the industry.

Strategic actions have been grouped into key themes that are common across all sectors. This roadmap emphasises the importance of fostering collaborative efforts between industry, researchers, extension officers and government and utilising multiple communication channels to reach the different groups. Of note is that all priority actions were considered options that could be started in the short term but may need a longer-term approach given the time that may be required to develop and implement.

### **Industry champions**

Within each sector, there are people that have experienced a biosecurity event firsthand. Each person that has experienced such an event has a unique experience and story to tell that can resonate with other producers and key industry people. Sharing these stories can have a powerful impact as it brings to life the impact that such an event can have on the livelihoods of the people affected. These messages can also help producers understand that disease outbreaks can happen anywhere and at any time and on any farm. The best line of defence that farms have is strict biosecurity practices and procedures that are followed by everyone.

#### *Implementation and timeframe*

1. Identify key people for within each sector, and if possible, each state, that are willing to share their story.
2. Each story should focus on key messages that are unique to their experience.
3. Make short 5 min videos with each industry champion and make widely accessible through online platforms.
4. Stories can also be shared through face-to-face events such as industry forums and online through webinars.
5. For immediate action by Australian Eggs and government.

### **Training**

A lot of good training material currently exists, however there were some gaps identified during the current project that should be addressed.

#### *Implementation and timeframe*

1. Run regular practical on-farm training designed specifically for farm staff. Utilise external expert providers to deliver the training.
  - i. Examples of training include rodent management and shed disinfection. Incorporate external materials, such as those already developed by Australian Eggs.
  - ii. Implement an annual training plan with external providers. Focus should be on how to implement specific practices into different production systems.
2. Develop and distribute take-home practical information that supplements the industry forums for producers to implement quickly into their own systems.
  - i. Implement immediately, and is ongoing for yearly Australian Eggs workshops.
3. Develop online biosecurity training modules for each sector.

- i. Each sector has key characteristics and the training should reflect this.
  - ii. Identify where the online training can be homed. An example is with Poultry Hub Australia as it is independent.
  - iii. The training should be freely available to encourage widespread use.
  - iv. Training can be incorporated as part of state-based food safety accreditation.
- 4. Develop starter-kits for new entrants to the industry.
  - i. Develop in consultation with industry and government to ensure that important information is included for new entrants.
  - ii. The biosecurity starter kit needs to be comprehensive and relevant for people new to the industry so that they are aware of the main risks, why biosecurity is important and the key practices to implement.
  - iii. This resource should be made available through state government websites and other suitable online sources such as the small-scale free-range poultry website.
  - iv. A key resource that should be developed within the next 2-3 years.
- 5. Biosecurity drills should be incorporated into yearly training activities.
  - i. Australian Eggs to review and update current training and tools available for farms to develop emergency biosecurity procedures.
  - ii. Develop specific criteria to conduct biosecurity drills that individual farms can adapt.

### **Biosecurity templates and standard operating procedures (SOPs)**

Creating a standardised set of biosecurity templates and SOPs will provide a clear set of on-farm biosecurity practices that can be adapted for individual farms across all industry sectors. These documents should cover all essential aspects of biosecurity, from access and hygiene protocols, contractor and supplier protocols, flock monitoring and emergency response plans.

#### *Implementation and timeframe*

1. Have biosecurity templates and SOPs developed for all different production systems, including pastured egg production with smaller numbers of hens and mobile housing units.
2. These resources should be developed immediately so that individual farms can adopt them into current biosecurity plans and practices.
3. Resources can be made available online for free access and promoted through suitable publications, newsletters and industry and government social media accounts.

### **Building local networks**

Having a local network for egg producers to regularly get together is a great opportunity for people to get to know other producers in their area and to share experiences.

#### *Implementation and timelines*

1. Develop discussion groups (peer-to-peer) with small and medium sized producers. Held twice a year, with key themes discussed and industry expert presentations.
2. Key state government biosecurity and food safety authorities to conduct quarterly updates to help small and medium sized producers stay informed.
3. Utilise already established networks such as local extension officers or Egg Farmers Australia to create opportunities for egg farmers to keep up to date but also network amongst their local producer groups.
4. Immediate action – in the short term identify key industry people in each state that can initiate and drive these groups. The long-term success of each group will be dependent on them being self-sustaining due to being run by the group members themselves.

### **Building a biosecurity culture**

Ensuring that all staff understand the reasons behind biosecurity measures is vital for fostering a culture of compliance. Developing clear explanations and rationale – the 'why's' – for each

biosecurity practice will help staff appreciate their importance. These explanations should be communicated through training sessions, signage, and regular meetings. When staff understand how their actions directly impact the health of the flock, the profitability of the farm and the security of their job, they are more likely to adhere to biosecurity protocols diligently.

#### *Implementation and timelines*

1. Develop key resources that farms can use to help instil the importance of biosecurity. For example, 30 second video snippets of farm workers talking about the reasons they think biosecurity is important. Individual farms can then add these resources into their training materials during induction. Industry champion videos will also be a good resource to use.
2. 'Walking the walk' means embedding biosecurity principles into the daily routines and mindset of every employee, ensuring that biosecurity measures are not just guidelines but integral to farm operations. Establish clear communication regarding the importance of biosecurity to staff.

#### **Industry wide biosecurity app**

Many apps currently exist to streamline biosecurity protocol and risk assessments for visitor and contractor entry. There is currently no industry wide app that has gained widespread adoption by the egg industry.

#### *Implementation and timelines*

1. Identify biosecurity apps that are suitable for the egg industry.
2. Independently trial the usability and suitability of each app for each industry sector.
3. Australian Eggs to subsidise the cost so that it is free of charge for industry wide uptake.
4. Promote the use of the app through food safety authorities so that all accredited egg producers are aware of its availability to the industry.

#### **Increased visibility of resources available**

It is not always easy for egg producers to find the available information due to lack of knowledge of where to look.

#### *Implementation and timelines*

1. Increase efforts to increase the visibility and accessibility of online biosecurity tools and resource by improving search engine optimisation through enhanced metadata and tags for individual resources and actively promoting resources through industry newsletters and social media channels.
2. Remove biosecurity relevant information from pay-walls so that all information is freely available. For example, the mass disposal planner.
3. These changes could be made immediately and continue indefinitely with each new resource developed.
4. For the small sector, information specific to this sector could be housed into one centralised online repository such as the small-scale free range poultry community of practice website.

#### **Biosecurity protocols of shared suppliers**

As part of the supply chain, feed, pullet suppliers, flock vaccination crews, spent hen catching and transport crews plus egg transport are all required to know and manage their biosecurity risks.

People, vehicles and the movement of eggs and birds is one of the greatest risks of disease spread. Many suppliers will supply the small and medium sized sectors, visiting multiple farms per day. Ensuring that these parts of the supply chain have adequate access to training, templates and other relevant information is important to ensure industry wide biosecurity compliance.



#### *Implementation and timelines*

1. Biosecurity messaging is extended to all suppliers in the egg supply chain.
2. Relevant biosecurity information can be included on feed bags and with feed stores.
3. All templates, SOPs and training should include this sector of the industry.
4. Engage with companies that provide day-old chicks to develop shared biosecurity messages to the suppliers of their product.
5. Farms to have strict on-farm procedures for all suppliers to follow that is communicated through supply arrangements.

**Continue state-specific biosecurity exercises:** The success of state-based biosecurity exercises with support from government and industry, with examples tailored to address the unique challenges and requirements of different regions, ensuring that all farms are adequately prepared to handle local biosecurity threats.

#### *Implementation and timelines*

1. Industry and government to continue to lead industry. Implement recommendations immediately and continue as required on an ongoing basis.

#### **Cost benefit analysis for different biosecurity practices:**

For farms where cost is a barrier to implement biosecurity practices, a better understanding of costs to implement different biosecurity measures and the payback regarding reducing risk would be beneficial.

#### *Implementation and timelines*

1. Australian Eggs to engage an agricultural economist to develop a calculator that all farms could use to determine the cost/benefit of the different biosecurity practices.
2. Initiated in the short term for delivery within the next 2 to 3 years.

#### **Long-term ideas to progress**

While the following do not sit specifically within the remit of an extension strategy, these challenges were consistently acknowledged by each sector.

#### **Vaccination**

The vaccination topic was multi-faceted.

#### Challenges to pursue:

1. The current climate with registering vaccinations and the availability of current vaccinations was raised. There is a requirement for a more streamlined approach to having vaccines continually registered.
2. There is interest to progress options to investigate allowing vaccination for enhanced disease prevention, particularly for addressing threats like *Salmonella* Enteritidis and highly pathogenic avian influenza.
3. There needs to be greater transparency in vaccination protocols and reporting mechanisms from pullet suppliers.
4. There is also the opportunity to further investigate options for compensation for *Salmonella* Enteritidis outbreaks on farm that are not deemed 'at-fault'.

#### **Consistency in state requirements for egg stamping and traceability**

1. Identify opportunities for state authorities to work together so that egg stamping requirements are consistent and traceable across the supply chain and state boundaries.

2. Stamp should indicate point of origin for all eggs supplied in Australia.
3. Greater transparency and traceability in spent hens.

## 7 Egg farms and biosecurity: planning fact sheet

One of the key objectives of this project was to develop a draft fact sheet for planning authorities. Each State planning authority has their own set of guidelines for development and environmental permits to operate a poultry farm. While biosecurity is not considered part of the planning and environmental approval process, there are many biosecurity considerations that should be considered for new and expanding poultry farms.

The following outlines information that would be suitable for a fact sheet for those assessing poultry related development and environmental permit applications.

### 7.1 Biosecurity considerations for new poultry farms

Biosecurity is the protection of poultry from pests and disease. Diseases can be spread through various means, including feral or domestic animals, people, vehicles, equipment, water supply, air and dust. When planning and environmental authorities are considering new poultry farm applications, the following biosecurity measures should be considered.

#### Location

- Consider the proximity of other poultry farms and related facilities (such as hatcheries, composting and egg grading facilities).
- It is recommended to have at least 1000 m separation between poultry farms to reduce the risk of disease spread.
- Hatcheries and breeding/rearing farms require greater separation distance from other poultry related operations.

#### Farm layout and design

- Proper design and placement of buildings and fencing is crucial to prevent access by native animals, feral animal and pests.
- If other species are present on farm they must be kept completely separate from poultry.
- There should be clear production area boundaries.
- Grading facilities should be separate to the production area.

#### Pest control

- Farm should have strategies in place to minimise the risk of pests, rodents, and wild birds.
- There should be provisions for feed to be stored in clean, dry and enclosed containers.
- Feed should be only made available to birds inside housing units as feed outside attracts wild birds.
- Farms must have an appropriate rodent control program in place within the production area.

#### Water management and distance from water bodies and wetlands

- There is an adequate supply of clean and fresh water for production purposes, including water for drinking, cleaning and range irrigation. Town water supplies and bore water is preferred.
- Any surface water (for example, dam, river) used for production purposes must have appropriate sanitation procedures in place.
- Maintain a distance from water bodies and wetlands. This is important for environmental purposes and also for biosecurity. Wild birds and waterfowl are attracted to water bodies and can be carriers of many poultry diseases.
- Manage the range to avoid water accumulation during rain events.

### **Waste and Dead Bird Management**

- There are provisions in place to appropriately dispose of farm waste such as nesting material.
- Dead birds are disposed on in a manner that is approved.
- An emergency disease disposal plan should be in place and any approvals for on-site burial are complete.
- The Australian Eggs Mass Disposal planner outlines options available for each farm in the event of an emergency animal disease and if mass disposal is required. This online tool is currently available for members only. A similar online tool is <https://www.mass-disposal-tool-agrifutures.com.au/>

### **Licensing and accreditation**

- All commercial poultry farms must be registered through their relevant state agricultural department.
- All egg producing farms that supply or sell eggs to the market need to be registered and accredited through the relevant state food safety organisation.
- Refer to your relevant state government department for specific guidelines and compliance requirements.

## 8 Recommendations and conclusions

There are many similarities across the different sectors of the egg industry regarding challenges and how these challenges can be addressed through enhanced communication and extension activities. However, each sector requires resources designed specifically to align to their production system.

Implementing robust biosecurity strategies is essential for enhanced compliance across all sectors of the industry. By focusing on key areas such as training, templates, standard operating procedures, local networks, industry champions, and fostering a biosecurity culture, the industry can improve the adoption of effective on-farm biosecurity practices. Leveraging modern technology, such as a biosecurity app, and ensuring the visibility and accessibility of resources further enhance the industry's capacity to acknowledge and maintain high biosecurity standards.

It is recommended that the industry adopt each sector specific strategy focussing on the following areas:

- Identify key industry champions to share their experiences and include in social media, through webinars training and videos.
- Develop online biosecurity training for each sector and continue to enhance the current training resources available including emergency biosecurity procedures and drills.
- Identify a suitable biosecurity app and make this readily available for all sectors as a free app to encourage usage and enhanced traceability.
- New producers lack the knowledge of where to go for suitable information and rely on website searches. There is a need for better aligned resources for the smaller sector with better search engine optimisation so that suitable and relevant information is the first in website searches.
- Build a biosecurity culture through messaging about why biosecurity is important so that all people, staff and contractors, value the importance of biosecurity. Consistent messaging through visual reminders and managers and owners 'walking the walk' will reinforce biosecurity practices and help build a robust biosecurity culture.
- Develop a range of templates and SOPs that industry can adapt to their individual business.
- Develop and encourage local networks and peer to peer learning of the different sectors through current industry networks and discussion groups.

In lieu of the workshop originally planned for this project, the project team will identify and produce a short video of a small-scale industry champion to share their story of how having an emergency animal disease on their farm has affected their business. We will also develop an online biosecurity course specifically for small scale egg producers. The outcomes of these activities will be shared via email with Australian Eggs.

The benefits of implementing these biosecurity strategies extend beyond individual farms to the entire egg industry. Through collaboration and commitment, the Australian egg industry can implement and maintain high biosecurity standards that will reduce the risk of disease introduction and spread. The industry is only as strong as its weakest link.

## References

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Raicot, M., Venne, D., Durivage, A. & Vaillancourt, J.P. (2012) Evaluation of the relationship between personality traits, experience, education and biosecurity compliance on poultry farms in Québec, Canada. *Preventative Veterinary Medicine*, 103, 201.

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# Appendices

## 8.1 Appendix 1: List of workshop attendees

**Names removed for privacy reasons**

Contact name	Company	State	Response
		NSW	Interested but not able to attend
		NSW	Attended
		NSW	Interested but not able to attend
		Qld	Attended
		Qld	Attended
		SA	Attended
			Not able to attend
		Vic	Attended
		Vic	Attended
		WA	Attended
		Tas	Attended
		National	Attended
		National	Australian Eggs

**Table 1 List of regulators invited to online workshop.**

Company	State	Response
	Qld	Attended
	Qld	Attended
	Qld	Was unavailable to attend on the day due – happy to complete questionnaire
	WA	Attended
	WA	No response
	Vic	Attended
	Vic	Not available
	NSW	Attended
	Vic	Did not hear back regarding suitable person
	SA	Not available – happy to complete questionnaire
	NSW	No response
	NSW	Happy to attend but unavailable on day – apology given
	Tas	Attended
		Attended

**Table 2 List of large egg farms invited to the online workshop.**

Company	State	Response
	SA	Attended
	SA	No response
	Vic	Unavailable but happy to complete questionnaire
	Vic	No email
	Vic	Attended
	NSW	Attended
	NSW	Forwarded information to livestock manager – did not attend.
	WA	Attended
	WA	No response
	WA	No email
	TAS	Emails bounced
	Qld	No response
	Qld	Attended

**Table 3 List of medium sized egg farms invited to the online workshop.**

Company	State	Response
	Qld	Attended
	Qld	No longer in eggs
	Qld	Attended
	Qld	Attended
	NSW	Happy to attend but unforeseen circumstances prevented it. Happy to answer questionnaire
	NSW	Contacted three times – no reply
	NSW	Happy to be involved – did not show for workshop
	NSW	Not interested in being involved
	Vic	Contacted three times – no reply
	Vic	Contacted three times – no reply
	SA	Contacted three times – no reply
	WA	Attended
	Tas	Contacted twice – no reply
	Tas	Too busy to attend but happy to answer questions separately

**Table 4 List of small sized egg farms invited to the online workshop.**



## 8.2 Appendix 2: Government biosecurity resources available online

Title	Type	Date published / last updated	Target audience(s)	Provider(s)
NSW biosecurity guidelines for free range poultry farms	Booklet	Jul-07	Free range layer farmers	NSW DPI
Moving poultry into and within NSW	Fact sheet	Dec-14	All poultry farmers	NSW DPI
Biosecurity - Highly pathogenic avian influenza	Fact sheet	Aug-20	All poultry farmers	NSW DPI
Biosecurity - <i>Salmonella</i> Enteritidis in the commercial layer & egg industry	Booklet	Sep-21	Commercial layer farmers	NSW DPI
Caring for free-range poultry after a flood	Fact sheet	Jun-22	All poultry owners	NSW DPI
Poultry keeping on a small scale	Fact sheet	May-03		NSW DPI
Biosecurity emergencies	Web pages			NSW DPI
Emergency Animal Disease Response Specific Training (Emtrain)	eLearning		All NSW DPI employees and partners	NSW DPI
AIMS Awareness e-learning course	eLearning		Veterinarians registered in NSW	NSW DPI
VETLEARN - Veterinarians, Hobby Farms and Backyard Livestock	eLearning		Veterinarians	NSW DPI
Emergency Animal Disease Surveillance Online training	eLearning		Veterinarians and veterinary students	NSW DPI
Eggs	Web pages			NSW Food Authority
<i>Salmonella</i> Enteritidis	Web pages	Not available		NSW DPI
How to comply with the Biosecurity ( <i>Salmonella</i> Enteritidis) Control Order 2020	Booklet	Jun-22	Licensed egg and poultry producers, incl. grading and packing facilities in NSW	NSW DPI
VISITORS sign template - Biosecurity Order	Template		All poultry farmers	NSW DPI
<i>Salmonella</i> Enteritidis	Fact sheet	Sep-18	All layer farms	NSW DPI
NSW egg monitoring diary	Book	Nov-19	All layer farms	NSW Food Authority
Prevent the spread of <i>Salmonella</i> Enteritidis	Fact sheet	Mar-19	All layer farms	NSW DPI
Rodent control and <i>Salmonella</i> Enteritidis	Fact sheet	Apr-19	All layer farms	NSW DPI
<i>Salmonella</i> Enteritidis Testing: Environmental Swab Submission Form	Form	Jul-20	Veterinarians	NSW DPI
Specimen submission form - <i>Salmonella</i> , SE / ST screening	Form	Jun-20	Veterinarians	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program (NSEMAP)	Web pages	Not available	Commercial layer farmers	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program Guidelines	Booklet	Not available	Commercial layer farmers	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program - Approved Laboratory Form	Form	Not available	Commercial layer farmers	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program - Approved veterinarian application form	Form	Not available	Veterinarians	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program - Audit form	Form	Not available	Auditors	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program -	Form	Not available	Commercial layer farmers	NSW DPI

Owner Agreement - Initial Accreditation				
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program - Approved veterinarian recommendation for initial accreditation form	Form	Not available	Veterinarians	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program - Owner Agreement - Re-Accreditation	Form	Not available	Commercial layer farmers	NSW DPI
National <i>Salmonella</i> Enteritidis Monitoring & Accreditation Program - Approved veterinarian recommendation for re-accreditation form	Form	Not available	Commercial layer farmers	NSW DPI
Good management practices (GMPs) for egg producers	Web pages	Not available	All layer farms	NSW DPI
Small-scale poultry keeping - feeding	Fact sheet	Nov-07	Small scale poultry farmers	NSW DPI
Small-scale poultry keeping - brooding and rearing chickens	Fact sheet	Nov-07	Small scale poultry farmers	NSW DPI
Small-scale poultry keeping - housing layers	Fact sheet	Nov-07	Small scale poultry farmers	NSW DPI
Building the poultry penthouse	Booklet	Jun-05	Small scale poultry farmers	NSW DPI
Guide for free range production of eggs and meat birds	Podcast		Free range layer farmers	NSW DPI
Backyard chickens	Fact sheet	Not available	Backyard chicken owners	NSW DPI
Biosecurity management plan	Web pages	Not available	All poultry producers	NSW DPI
Farm workers and visitors	Web pages	Not available	All farmers who employ seasonal workers or have visitors (including utility service providers)	NSW DPI
Biosecurity Warrior program			Community and schools	NSW DPI
Biosecurity in your backyard	Videos	2018	Community, schools and peri urban	NSW DPI
One Biosecurity program	Program			PIRSA
Moving poultry to SA from interstate	Web page			PIRSA
Avian influenza	Web page			PIRSA
Newcastle disease	Web page		Poultry farms with over 1000 chickens	PIRSA
<i>Salmonella</i> Enteritidis (SE)	Web page		All layer farms	PIRSA
Infectious laryngotracheitis (ILT)	Web page	Nov-23	All poultry farms	PIRSA
Vaccinations and antibiotics for poultry	Web page	Feb-23	All poultry farms	PIRSA
Antimicrobial drugs registered for use in poultry in Australia	Fact sheet	Jul-21	All poultry farms and veterinarians	PIRSA
Biosecurity for spent litter/manure removal from broiler farms	Fact sheet	Feb-19		PIRSA
Caring for livestock during a heatwave	Web page	Oct-23	All poultry farms	PIRSA
Regulations for SA egg producers (incl. Food Safety Scheme)	Web page	Jun-23	All layer farms	PIRSA
Property identification codes (PIC)	Web page	Sep-23	Commercial poultry producers of eggs or meat who is required to have food safety accreditation must have a PIC	PIRSA
Poultry health - Fancy flock vaccination	Fact sheet	Apr-14		PIRSA
Poultry and pigeon biosecurity	Web page			NRE TAS
Biosecurity checklist for bird keepers	Fact sheet	Not available		NRE TAS
Small scale poultry/bird owner - general biosecurity duty	Web page	Jul-23	Small scale poultry/bird owner	NRE TAS
Egg Food Safety Scheme (Tasmania)	Web page	Jun-23		NRE TAS

Egg Food Safety Scheme	Fact sheet	Not available	Small commercial egg producers	NRE TAS
Egg producer application forms	Web page	Jun-23	All egg farmers	NRE TAS
Eggs (Tasmanian Egg Industry page)	Web page	May-23	All egg farmers	NRE TAS
Biosecurity guidelines for poultry/bird shows	Web page	May-23		NRE TAS
Biosecurity fact sheets and other publications	Web page	Jul-23	All egg farmers	NRE TAS
Composting and mad cow disease - understanding the risks in using restricted animal material (RAM)	Fact sheet	Aug-19		NRE TAS
Using poultry litter as fertiliser - minimising the risk	Fact sheet	Jan-15		NRE TAS
Property owners guide to biosecurity	Fact sheet	Apr-16	All property owners	NRE TAS
Biosecurity practices for property visitors	Fact sheet	Apr-16	All property owners	NRE TAS
Include your animals in your bushfire plan	Fact sheet	Nov-22	All property owners	NRE TAS
Biosecurity Emergency Management	Web page	Jun-23	All property owners	NRE TAS
Biosecurity (home page)	Web page	Not available		Ag VIC
Poultry diseases	Web page	Not available	All poultry owners	Ag VIC
Biosecurity for poultry producers	Web page	Not available		Ag VIC
Avian influenza (bird flu)	Web page	Aug-23		Ag VIC
Avian influenza factsheet	Fact sheet	Aug-23		Ag VIC
Avian influenza FAQs for backyard poultry owners	Web page	Oct-23	Backyard poultry owners	Ag VIC
Keeping backyard poultry	Web page	Aug-23	Backyard poultry owners	Ag VIC
Food safety for egg producers	Web page	Jul-20	All egg farmers	Ag VIC
Complying with the egg production standard	Web page	Oct-22	All egg farmers	Ag VIC
Recording keeping templates	Template	Not available	All egg farmers	Ag VIC
Food safety management statement template with a worked example	Template	Jul-15	All egg farmers	Ag VIC
Nutrition panel calculator	Tool	Sep-23	All egg farmers	Ag VIC
Avian influenza information for veterinarians	Web page	Oct-23	Veterinarians	Ag VIC
Newcastle disease	Web page	Aug-23	All poultry owners	Ag VIC
Vendor declaration form (Newcastle disease vaccination)	Form	Jul-18	All poultry owners	Ag VIC
Application for a Permit to Purchase, Possess and Administer Newcastle Disease Vaccine	Form	Jul-18	All poultry owners	Ag VIC
Quarantine advice when introducing new birds	Web page	Oct-23	All poultry owners	Ag VIC
<i>Salmonella</i> Enteritidis	Web page	Aug-23	All egg farmers	Ag VIC
<i>Salmonella</i> Enteritidis (A summary of recommended biosecurity practices to protect your business from <i>Salmonella</i> Enteritidis)	Fact sheet	Not available	All egg farmers	Ag VIC
Farm biosecurity planning and templates	Web page	Oct-22	All farmers	Ag VIC
Agriculture Victoria BMP coversheet template	Template	Not available	All farmers	Ag VIC
Practical biosecurity steps on your farm	Web page	Mar-23	All farmers	Ag VIC
Biosecurity - Making it work on your farm - webinar recording	Video	Oct-22	Small landholders	Ag VIC
OUTBREAK Animal and Plant Pests and Diseases	Web pages			Australian Government

Biosecurity basics	Video	Aug-19		Australian Government
Feed mill biosecurity guidelines	Video	8-Oct-19	Mill Hands	AgriFutures Chicken Meat Program
Exhibition bird biosecurity	Video	19-Feb-17	Exhibition Poultry Groups	AgriFutures Chicken Meat Program
Biosecurity and disease prevention	Web page	2023 (?)	All poultry farmers	Poultry Hub Australia
Biosecurity on your property (playlist)	YouTube channel	Mar-11	All livestock owners	Australian Government
Poultry & birds	Web page		Poultry and bird owners	DPIRD
Biosecurity and Agriculture Management Act 2007	Web page		All primary producers	DPIRD
Stickfast fleas: control and eradication	Web page	Jul-23	Backyard poultry flocks	DPIRD
Chickens, eggs and organochlorines	Web page	Jun-22	All poultry producers and owners	DPIRD
Regulation of poultry production	Web page	Mar-22	All poultry producers	DPIRD
Sampling and post-mortem resources for veterinarians	Web page	Jul-20	Veterinarians	DPIRD
Poultry biosecurity checklist for small landholders	Web page	Dec-19	Small poultry producers/landholders	DPIRD
Newcastle disease	Web page	Nov-19	All poultry and bird owners	DPIRD
Newcastle disease - information for commercial poultry producers	Web page	Jun-18	Commercial poultry producers	DPIRD
Code of practice: managing the risk of Newcastle disease in Western Australia	Web page	Jun-18	All poultry producers	DPIRD
Newcastle disease sample collection - Western Australia	Web page	Dec-18	Veterinarians	DPIRD
Newcastle disease surveillance laboratory submission form	pdf	Jul-19	Veterinarians	DPIRD
Avian influenza	Web page	Nov-19	All poultry and bird owners	DPIRD
Biosecurity for poultry producers	Web page	Nov-16	All egg farmers	Queensland Government
Biosecurity risks to poultry farms	Web page	Nov-22	All commercial poultry producers	Queensland Government
Developing a biosecurity plan for your poultry farm	Web page	Nov-16	All commercial poultry producers	Queensland Government
Biosecurity and free-range poultry farming	Web page	Nov-16	Free range poultry farmers	Queensland Government
Managing sick poultry and emergency situations	Web page	Mar-23	All poultry owners	Queensland Government
Avian influenza	Web page	Mar-23	All poultry owners	Queensland Government
Moving designated birds	Web page	Jul-16	All poultry owners	Queensland Government
Bird biosecurity (Eight simple steps will help prevent disease in your birds; Bird show participants; Exhibition bird biosecurity video; Biosecurity video clips [generic not poultry specific]; The National Australian Poultry Identification Scheme [game birds])	Web page	Nov-19	All poultry and bird owners	Australian Government
Avian influenza (bird flu)	Web page	Aug-23	All poultry and bird owners	Australian Government
Avian influenza (bird flu) [In general]	Web page	Dec-23		Australian Government
Facts about avian influenza	Web page	Dec-23		Australian

				Government
Domestic poultry and birds	Web page	Dec-23		Australian Government
Human health information	Web page	Dec-23		Australian Government
Preventative action by the Australian Government	Web page	Dec-23		Australian Government
Commercial poultry producers [links to other resources]	Web page	Dec-23		Australian Government
Contact with wildlife	Web page	Dec-23	Wildlife managers	Australian Government
Information for veterinarians	Web page	Dec-23	Veterinarians	Australian Government
Bird flu and our health	Web page	Nov-19	Everyone	Australian Government
National biosecurity manual - exhibition poultry	Manual	Jun-11	Poultry exhibitors	Australian Government
Biosecurity guidelines for exhibition poultry - club log book	Template	Jun-11	Poultry exhibitors	Australian Government
Biosecurity guidelines for exhibition poultry - log book for individuals	Template	Jun-11	Poultry exhibitors	Australian Government
Protect your birds against bird flu and diseases	Web page	Nov-19	All poultry and bird owners	Australian Government
Protect your birds against bird flu and diseases	Web page	Nov-19	All poultry and bird owners	Australian Government
National biosecurity training hub	Training	2023	Everyone	Various, led by AHA and PHA
EAD (emergency animal disease) foundation online course	Training		Everyone involved in livestock industries	AHA
EAD (emergency animal disease) online training for vets	Training		Poultry veterinarians	AHA
EAD (emergency animal disease) surveillance online training	Training		Poultry veterinarians	AHA
Biosecurity emergency response training Australia (BERTA)	Training		Poultry veterinarians	AHA
FarmBiosecurity app	app		Livestock producers	farmbiosecurity
Farm Biosecurity Action Planner (biosecurity management plan template)	Template		Livestock producers	farmbiosecurity
Newcastle disease management program	Web page		Livestock producers	AHA
6 easy steps to completing your on-farm biosecurity plan	Video	Jul-17	Livestock producers	AHA

**Table 5 Government and RDCs (other than Australian Eggs) biosecurity related information and resources available online. Content provided by Felicity McIntosh.**

## 8.3 Appendix 3: Australian Eggs and Egg Farmers Australia biosecurity resources available online

Title	Type	Date published	Target audience(s)	Provider(s)
Ask the Eggsperts - 'Optimising free range performance through management'	Video	27-Jan-21	Free range egg farmers	Australian Eggs
Australian Eggs	YouTube channel	Apr-12	All egg farmers	Australian Eggs
Chemical search and filter tool	Tool		Farmers	Australian Eggs
Decontamination for the Australian poultry industry	Video	31-Mar-21		Australian Eggs
For visitors	Poster	Unknown	Farmers	Australian Eggs
Healthy hens - How do you manage biosecurity in the free range environment?	Video	Nov-22	Free-range egg farmers	Australian Eggs
Healthy hens - How do you manage biosecurity on an egg farm?	Video	Nov-22	All egg farmers	Australian Eggs
Healthy hens - Why is biosecurity important?	Video	Nov-22	All egg farmers	Australian Eggs
Keep your farm disease free	Poster	Unknown	Farmers	Australian Eggs
Protect your birds from people	Poster		All egg farmers	Australian Eggs
Safe water for healthy birds	Poster		All egg farmers	Australian Eggs
National Farm Biosecurity Manual POULTRY PRODUCTION	Manual	May-09	Farmers	Australian Eggs
National Farm Biosecurity Technical Manual for Egg Production	Manual	Sep-20	Farmers	Australian Eggs
National Water Biosecurity Manual POULTRY PRODUCTION	Manual	2009	Farmers	Australian Eggs
On-farm biosecurity risk identification framework for the Australian layer industry	Report	Nov-19	All egg farmers	Australian Eggs
Reduce <i>Salmonella</i> in egg storage and transport	Poster		All egg farmers	Australian Eggs
Review of rodent control for the Australian chicken meat and egg industries	Manual	Aug-20	All egg farmers	Australian Eggs and AgriFutures Chicken Meat Program
<i>Salmonella</i> Risk Assessment Toolkit	Toolkit		Farmers	Australian Eggs
Snapshot Survey	Industry survey	Oct-23	All egg farmers	Australian Eggs
Vaccination prevents disease	Poster	Unknown	All egg farmers	Australian Eggs
Vaccination training manual	Booklet	2018	All egg farmers	Australian Eggs
Mass disposal preparedness for the poultry industries - final report summary	pdf		All egg farmers	Australian Eggs and AgriFutures Chicken Meat Program
Mass disposal preparedness for the poultry industries - final report	pdf		All egg farmers	Australian Eggs and AgriFutures Chicken Meat Program
Guide to rodenticides for Australian egg farmers	pdf	2021	All egg farmers	Australian Eggs and AgriFutures Chicken Meat Program
Biosecurity plan [workbook] template - booklet 1 - Instructions for using the template	pdf		All egg farmers	Australian Eggs
Biosecurity plan [workbook] template - booklet 2 - Template document	pdf		All egg farmers	Australian Eggs
Biosecurity plan [workbook] template - booklet 3 - Internal biosecurity audit guide	pdf		All egg farmers	Australian Eggs
Protect your birds from other animals	Poster		Free-range egg farmers	Australian Eggs
Healthy birds = healthy returns - Check your birds regularly	Poster		All egg farmers	Australian Eggs
Advice to producers on selling backyard hens and their obligations	pdf		All egg farmers	Australian Eggs
Sizing of the backyard and micro-	pdf	Oct-21	Industry	Australian Eggs

commercial egg production in Australia				
Traceability in the egg industry	Video	Nov-21	Industry	Australian Eggs
How to find information about biosecurity on your egg farm	Video	Mar-21	Egg farmers	Egg Farmers Australia
Egg Farmers of Australia	YouTube channel	May-20	Egg farmers	Egg Farmers Australia
SE guide for producers	Manual		Egg farmers	Australian Eggs
SE swabbing procedures	Procedure		Egg farmers	Australian Eggs - Members
<i>Salmonella</i> response plans	Manuals		Egg farmers	Australian Eggs - Members
Egg Standards of Australia	Templates		Egg farmers	Australian Eggs - Members
Biosecurity virtual reality training tool	Online	May-23	Egg farmers	Australian Eggs - Members
Avian influenza guide	Pdf		Egg farmers	Australian Eggs - Members
Health Hens, Safe Eggs, Health People: Biosecurity information for new staff in the Australian egg industry	Manual	2022	Egg farmers	Australian Eggs - Members
<i>Salmonella</i> poster series	Posters		Egg farmers	Australian Eggs - Members
Healthy hens poster series	Posters		Egg farmers	Australian Eggs - Members
Signs of disease posters	Posters		Egg farmers	Australian Eggs - Members
Avian influenza checklist	Template		Egg farmers	Australian Eggs - Members
Avian influenza gap analysis for the egg industry	Report	Sept-22	Egg farmers	Australian Eggs - Members
HPAI Prevention: Managing waterfowl	Fact sheet		Egg farmers	Australian Eggs - Members

**Table 6 Australian Eggs and Egg Farmers Australia biosecurity related information and resources available online. Content provided by Felicity McIntosh.**

# Plain English Summary

<b>Project Title:</b>	<b>Extension and communication strategies to improve biosecurity</b>
Australian Eggs Limited Project No	INNO019
Researchers Involved	R. Osmond and F. McIntosh
Organisations Involved	Department of Agriculture and Fisheries, Queensland 203 Tor St Toowoomba Qld
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<b>Objectives</b>	To develop targeted biosecurity extension and communication strategies for the small, medium and large egg sectors
<b>Background</b>	Australia's commercial egg sector includes operations that vary in scale and production systems; from large-scale fully integrated companies to much smaller owner-operator farms, with eggs currently produced in three main production systems: cage, barn and free-range. Regardless of size or system, all producers face similar biosecurity challenges and must implement comprehensive strategies to prevent the introduction and spread of infectious diseases. Due to the diversity of egg producers and production systems, there is no one-size-fits-all approach to communicating and engaging with each sector.
<b>Research</b>	This project engaged with producers from each of the different segments through a series of online workshops. The purpose of the workshops was to identify how producers from each sector obtain their information regarding biosecurity, ways to engage and further actions to improve knowledge and adoption of biosecurity practices. The extension and communication strategy for each egg sector was developed based on the information discussed during the workshop. While there are some similarities in the approaches that should be taken regarding extension and communication practices to improve biosecurity between the sectors, there is also some differences that reflect how the different sectors engage and like to receive information.
<b>Outcomes</b>	The outcomes of this project include: <ul style="list-style-type: none"> <li>• Biosecurity extension strategies for each of the egg industry sectors.</li> <li>• A draft fact sheet for planning authorities</li> </ul>
<b>Implications</b>	Implementing robust biosecurity strategies is essential for enhanced compliance across all sectors of the industry. By focusing on key areas such as training, developing templates and standard operational procedures, local networks, industry champions and fostering a biosecurity culture, the industry can improve the adoption of on-farm biosecurity practices. Leveraging modern technology such as a biosecurity app and ensuring the visibility and accessibility of resources further enhance the industry's capability to acknowledge and maintain high biosecurity standards.



**Key Words**

Biosecurity, extension, strategy

**Publications**

N/A