Cross Industry Biosecurity and Emergency Animal Disease (EAD) Awareness

by Animal Health Australia
May 2018
Cross Industry Biosecurity and Emergency Animal Disease (EAD) Awareness

Final Report

by

Animal Health Australia

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Foreword

Improving biosecurity and Emergency Animal Disease (EAD) awareness is crucial for protecting and preserving animal health in Australia’s livestock industries, maintaining access to international markets and reducing unnecessary production costs.

Small and emerging animal industries are not often targeted in communication and extension activities promoting biosecurity and EAD practices, resulting in low awareness. This project aimed to measure industry awareness about biosecurity then develop and distribute materials that would assist in raising the awareness of these industries by creating and distributing industry specific messaging and materials.

The findings from this project indicate that future communication campaigns, including both general biosecurity messaging as well as industry specific targeted messaging, are warranted to ensure that producers across the whole livestock industry are included and informed. Representatives of industry bodies, where present, should be included in all stages of future communications efforts.

This report is an addition to AgriFutures Australia’s diverse range of over 2,000 research publications and it forms part of our Emerging Industries arena, which aims to support the early-stage establishment of high potential rural industries.

Most of AgriFutures Australia's publications are available for viewing, free downloading or purchasing online at www.agrifutures.com.au.

John Harvey
Managing Director
AgriFutures Australia
About the Author

Animal Health Australia (AHA) is a not-for-profit public company that facilitates innovative partnerships between governments, major livestock industries and other stakeholders to protect animal health and the sustainability of Australia's livestock industry.

Acknowledgments

Dr. Marta Hernandez-Jover and Ms. Lynne Hayes from Charles Sturt University for industry consultation before and after the biosecurity communications. Without their help this project would not have been possible.

Participating industry bodies and producers for their participation in the project.

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHA</td>
<td>Animal Health Australia</td>
</tr>
<tr>
<td>CSU</td>
<td>Charles Sturt University</td>
</tr>
<tr>
<td>EAD</td>
<td>Emergency Animal Disease</td>
</tr>
<tr>
<td>FMD</td>
<td>foot-and-mouth disease</td>
</tr>
</tbody>
</table>
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Executive Summary

What the report is about

- Initial surveys of industry representatives and a cross-industry questionnaire of producers indicated biosecurity and Emergency Animal Disease (EAD) awareness across new and emerging industries was low prior to this project. Consultation suggested that, in general, most of the identified industries do not actively participate in a specific extension program related to biosecurity, animal health or EAD awareness and reinforced the requirement for the project.
- The outcomes of this research will inform future communication and extension strategies with new and emerging industries. In particular, this project highlights the need to provide industry specific information and tailor communications and extension activities to increase producer engagement. However, this project also indicates general messaging can be effective for relaying information, especially if materials remain relevant and useful to any producer or industry.
- The project also highlights the need for further engagement with these industries on biosecurity and EAD awareness in the future.

Who is the report targeted at?

This report is targeted at AgriFutures (as the project funders) and future providers of communications to Australian livestock industries, specifically producers from new, emerging and maturing industries.

Where are the relevant industries located in Australia?

The industries targeted by this project are varied and located throughout Australia. Membership, producer engagement, production value and markets differ between these industries. However, producers from any of the industries have the potential to benefit from this project.

The new, emerging and maturing industries identified for inclusion in this project were:

- Alpaca
- Buffalo
- Camel
- Crocodile
- Dairy goat
- Dairy sheep
- Deer
- Duck
- Emu
- Fibre goat
- Game bird
- Kangaroo
- Marron
- Ostrich
- Rabbit
- Redclaw
- Turkey
Background

Aims/objectives

The aim of this research is to identify and communicate with new, emerging and maturing industries the need to implement:

- on-farm biosecurity;
- biosecurity practices required for good business risk management; and
- a producer’s responsibilities in reporting a notifiable disease as well as their role in an EAD event.

As a result, a primary objective of this research was to develop and distribute materials that will assist in raising this awareness and measure the resulting change.

Methods used

In collaboration with researchers from Charles Sturt University (CSU), this project consisted of four phases to achieve the research objectives:

1. Undertake a survey to gather information on new, emerging or maturing industries and identify preferred methods of communication by participants in the sector. The survey consisted of two parts:
   - industry representative semi-structured interviews; and
   - a cross-sectional study of producers among these industries.

   This phase provided the opportunity to assess whether or not engagement would continue with a sector, essentially a go-no-go step.

2. Develop key messages and communication materials to meet the requirements of each target sector. Biosecurity resources were utilised from the Farm Biosecurity website (an existing website that provides information to mainstream Australian livestock industries).

3. Develop a communications plan and extension strategy to disseminate the developed materials.

4. Assess the impact of the communication activities by measuring change in awareness.

Results/key findings

The CSU research team collected base line information from new, emerging and maturing industries in Australia which suggested most industries did not actively participate in an existing extension program which provide information on biosecurity, animal health or EADs. Further, industries had a low awareness of the EAD Watch Hotline and the Farm Biosecurity Program website.

Industry consultation indicated most sectors favoured information which was delivered in passive (email) and active (website) electronic formats. Biosecurity concerns tended to be industry specific. The key messages developed were kept broad to increase biosecurity awareness in general. The communication material consisted of a variety of formats to reach multiple audiences and followed an informed extension strategy. Analysis of the short-term impacts of the project and perception of change suggests communication activities raised awareness for the need to implement on-farm biosecurity, biosecurity practices required for good business risk management and a producer’s responsibilities in reporting a notifiable
disease as well as their role in an EAD event. However, the CSU research team was limited by the timeframe of the project and was unable to evaluate the long-term impacts.

The presentation of visual communication materials, posters and videos, received positive feedback across industry, specifically the videos which demonstrate biosecurity risks and practices. In general, the majority of producers who participated in the final interviews highlighted areas in which information could be targeted to specific sectors. It was suggested that tailoring messaging, images or information could make the materials more useful and relevant to a producer in these industries.

**Implications for relevant stakeholders**

The industry sectors of focus were provided with educational tools and information to improve awareness of biosecurity practices and EAD preparedness and reporting responsibilities. Engagement with industry participants provides the opportunity for producers to be responsible if an EAD event occurs, improve market access and protect animal health in their operations. Effective biosecurity practices can assist producers by reducing unnecessary production costs associated with the presence of diseases, pests and weeds. Australia’s market access and livestock industries, both mainstream and emerging, benefit from collective biosecurity measures. Cross industry awareness is therefore essential.

This project provided a snapshot of new, emerging and maturing industry knowledge of biosecurity and EAD in Australia. The initial industry consultation suggested biosecurity and EAD awareness was low for these industries. Greater consideration is required for future communication campaigns to ensure producers across the whole livestock industry are captured and informed.

**Recommendations**

Where they exist for an industry, representative bodies should be used for the dissemination of information on biosecurity and EADs. Consultation about the messaging with industry representatives prior to the dissemination of materials would be a useful extra step for future communications to resolve some of the identified issues. It can be difficult to contact industry representatives or producers, so plenty of time to do so should be included in future communications efforts.

As some of these industries haven’t had much experience with biosecurity previously, it may be beneficial to provide more basic biosecurity messaging in future to help producers understand what biosecurity is and then build upon this. Finding producers who are already carrying out biosecurity practices on their farm and sharing their story with others in the industry (through articles or videos) may also be valuable in future.

For industries who feel biosecurity is not a priority for them compared to issues such as marketing and sustainability, it would be worth developing messaging that shows the relationship between these issues and biosecurity or how good biosecurity practices within that industry help to strengthen Australia’s biosecurity as a whole. Providing examples of EADs that have impacted on other industries may assist producers in those industries that haven’t experienced a serious EAD outbreak to realise how important biosecurity is and its relevance to them.

It is recommended that a variety of communication materials should continue to be disseminated to these industries to increase the number of producers reached with the biosecurity communications. Future communications to new, emerging and maturing livestock industries should aim to provide both general biosecurity messaging as well as some industry specific or targeted messaging to account for nuances in the different production systems.
Introduction

Background to the project

Biosecurity is crucial for protecting and preserving animal health in Australia's livestock industries, maintaining access to markets and reducing unnecessary production costs. Therefore, awareness of biosecurity risks and practices on-farm is essential across all livestock enterprises. However, new, emerging and maturing industries are often not the target of communication in the biosecurity space. In collaboration with Charles Sturt University (CSU), Animal Health Australia (AHA) undertook research to raise awareness of on-farm biosecurity practices and Emergency Animal Disease (EAD) preparedness in Australia's new, emerging and maturing industries.

The development of extension strategies and materials to promote on-farm biosecurity and EAD preparedness specific to new, emerging and maturing industries provides an opportunity to target the key biosecurity risks concerning each industry. The communication activities support the implementation of on-farm biosecurity practices for good business risk management. They also alert the producer to their responsibility in reporting a notifiable disease as well as their role in responding to an EAD event.

New, emerging and maturing industries are diverse in size and level of commercial operation. For example, the kangaroo industry involves wild harvest while industries such as the alpaca, dairy sheep, dairy and fibre goat and duck industries have both hobby and commercial/semi-commercial operators. Therefore, producers are likely to have different drivers influencing adoption of best-practice from information dissemination. As a result, the diversity of new, emerging and maturing industries refutes the notion of a 'one-size fits all' approach and so dissemination of relevant information must cater to the diversity of these industries to be accessible to all levels of producers.
Objectives

Objectives of the project were:

1. Raise awareness of the need to implement on-farm biosecurity practices
2. Raise awareness of what biosecurity practices are required for good business risk management
3. Raise awareness of the producers’ responsibilities in reporting a notifiable disease as well as their role in responding to an EAD event
4. Develop and distribute materials that will assist in raising this awareness
Methodology

In collaboration with CSU, this project consisted of four phases to achieve the research objectives. All activities used to collect information by the CSU research team for this project were approved by the Human Ethics Committee of the Faculty of Science, CSU.

Phase 1:

An initial survey was undertaken to gather baseline information on new, emerging or maturing industries and identify preferred methods of communication by participants in the sector. This phase provided the opportunity to assess whether or not engagement would continue with a sector, essentially a go-no-go step. The survey consisted of two parts, a consultation with industry representatives and questionnaire targeted at industry producers.

Industry consultation

In total, 17 industry representatives were contacted to participate in semi-structured interviews. The interview questions aimed to provide an overview of the industry, biosecurity and animal health concerns and the industries current biosecurity awareness programs. The interviews were qualitatively analysed and recommendations made to guide further communication and extension activities.

Cross-sectional study amongst producers

A questionnaire was developed to gather information on demographics, general husbandry, animal movements, biosecurity, animal health management and communication networks. There was a total of 37 questions with the majority of them being close-ended. Questionnaires were modified to be industry specific after consultation with industry representatives. A similar questionnaire format was followed for 15 of the 17 industries. Questionnaires for kangaroo and redclaw producers were significantly different from other industries to reflect the specificities of these farming system (i.e. harvesting rather than farming). Industry consultation indicated the online distribution was the best approach to reach majority of producers. Survey Monkey® was used for distribution to all producers with the exception of 138 dairy goat producers who received postal questionnaires. A reminder to complete the survey was sent three weeks after initial distribution to increase the response rate of participants.

Data from all completed and returned questionnaires were checked for errors and descriptive analysis was completed using IBM SPSS Statistics for Windows. A content analysis of questions targeting biosecurity practices was used to calculate a simple composite ‘biosecurity score’ (maximum score of 9) for foot-and-mouth disease (FMD) susceptible industries (alpaca, dairy goats and fibre goats), see Table 1.

A producer’s individual score was calculated based on their responses provided in the questionnaire. Questions included whether they record things such as visitors, treatments, and incidence of disease and deaths in their animals. They were also asked about whether they isolate new animals on their property, visitors’ biosecurity practices and how they dispose of dead animals.
Table 1. Biosecurity practices used to calculate overall biosecurity score of producers of new and emerging industries

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate isolation of incoming animals upon arrival &gt;21 days?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Are visitors required to wash their hands before and after handling your animals?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Are visitors with contact with animals provided with clothes/overalls?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Do you keep records of visitors?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>How often do you inspect your animals?</td>
<td>Daily or weekly</td>
<td>1</td>
</tr>
<tr>
<td>Do you record the number of animals with disease?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Do you record the number of animals that died or were euthanased?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Do you record treatment routines?</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>How do you dispose of dead animals?</td>
<td>Any selected</td>
<td>1</td>
</tr>
<tr>
<td>• Burn /Bury/Compost/Collected by external service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Leave to decompose in paddock</td>
<td>If also selected</td>
<td>0</td>
</tr>
</tbody>
</table>

A content analysis of biosecurity knowledge was performed to assess thematic categories and subsequently interpretive coding was used to assign the relative biosecurity knowledge of producers from each industry. Four categories were created:

0. No knowledge (I don’t know / incorrect reference to introduction and spread of diseases);

1. Low level of understanding of biosecurity (general mention of disease prevention but no reference to introduction and/or spread);

2. Moderate level of understanding of biosecurity (correct reference to practices preventing the introduction or the spread);

3. High level of understanding of biosecurity (correct reference to practices preventing the introduction and spread of disease).

**Phase 2:**

Key messages and communication materials were developed to promote on-farm biosecurity practices and generate greater awareness about EAD preparedness and reporting responsibilities (Table 2). To be relevant across industries, general messaging was used and biosecurity resources were utilised from the Farm Biosecurity website (an existing website managed by AHA and Plant Health Australia that provides information for mainstream Australian livestock industries – see [www.farmbiosecurity.com.au](http://www.farmbiosecurity.com.au)).

Industry specific messaging was also used to target individual new, emerging and maturing industries (Table 3).
Table 2. Key general biosecurity messages

<table>
<thead>
<tr>
<th>Key message number</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Look, check, ask a vet, if you see anything unusual in your livestock report it. Early disease detection is vital for every industry – big or small.</td>
</tr>
<tr>
<td>2</td>
<td>Whether you farm crocodiles or cattle, red claw or rabbit; biosecurity makes good business sense for all producers.</td>
</tr>
<tr>
<td>3</td>
<td>Secure your farm, secure your future</td>
</tr>
<tr>
<td>4</td>
<td>Don’t think your industry is too small to be affected by an emergency disease outbreak. It only takes one sick animal to bring down an entire livestock sector. If you suspect a disease call the emergency animal disease watch hotline on 1800 675 888.</td>
</tr>
<tr>
<td>5</td>
<td>You might be part of a small industry, but you have a big role to play in ensuring you maintain good on-farm biosecurity practices.</td>
</tr>
<tr>
<td>6</td>
<td>Emergency animal diseases can just as easily affect Australia’s new and emerging industries, so protect your farm and your profits by implementing a biosecurity plan today.</td>
</tr>
</tbody>
</table>

Table 3. Specific industry specific biosecurity messages

<table>
<thead>
<tr>
<th>Industry</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>Don’t be a turkey – Look, check and ask a vet.</td>
</tr>
<tr>
<td>Ostrich</td>
<td>Don’t bury your head in the sand - Look, check and ask a vet</td>
</tr>
<tr>
<td>Emu</td>
<td>It’s our national symbol, let’s keep it that way. Biosecurity matters to all animal industries great and small.</td>
</tr>
<tr>
<td>Marron and redclaw</td>
<td>Don’t let an emergency or exotic animal disease get its claws into your business. If you see a suspicious disease, report it.</td>
</tr>
<tr>
<td>Deer</td>
<td>Don’t get caught like a deer in the headlights - implement biosecurity on your property to avoid the risk of an exotic disease or pest incursion.</td>
</tr>
<tr>
<td>Camel</td>
<td>Don’t let pests and diseases become the hump in your business plans</td>
</tr>
<tr>
<td>Buffalo</td>
<td>Beef up your bovine biosecurity to avoid the risk of an exotic disease incursion.</td>
</tr>
<tr>
<td>Crocodile</td>
<td>Don’t be snapped up by an exotic animal disease, call the emergency animal disease watch hotline if you suspect anything unusual in your crocs.</td>
</tr>
<tr>
<td>Kangaroos</td>
<td>Hop on the biosecurity bandwagon to ensure you’re not spreading pests and diseases when out hunting and harvesting kangaroos.</td>
</tr>
<tr>
<td>Dairy sheep</td>
<td>Don’t get fleeced by a disease or pest incursion and milk biosecurity good biosecurity for what it’s worth.</td>
</tr>
<tr>
<td>Rabbit</td>
<td>Don’t stew over the threat of an emergency disease or pest incursion, implement a robust biosecurity plan for your business.</td>
</tr>
</tbody>
</table>
Phase 3:

Desktop searches for key publications, organisations and industry channels was undertaken to assist with disseminating information to the new, emerging and maturing industries of focus.

Recommendations from industry representatives and research outcomes from phase 1 guided dissemination of the information. Industry representatives indicated the preferred method of communications was principally in passive (email) and active (website) electronic formats. A communications plan was developed with an extension strategy to disseminate materials.

Distribution of materials took place over a four-month period (from February to June 2017) and consisted of the following communication activities:

- The development of a ‘New and Emerging Livestock Industries’ web page on the Farm Biosecurity website, including general videos on farm biosecurity practices.
  - The web page was completed in early February and gained 690 page views for the duration the campaign was active – over 100 visitors per month.
- The creation of industry specific posters and fact sheets (see Appendix 2) for each of the new and emerging industries, with the exception of alpaca, dairy/fibre goats and ducks.
- The distribution of a unique magazine and or newsletter articles for each industry.
- A general media release, issued on 11 May 2017, to all regional and rural radio and newspapers across Australia.
- The production of two general newsletter articles, promoting biosecurity, distributed on the Farm Biosecurity E-newsletter and social media (Facebook and Twitter).
- Social media posts were generated and ‘boosted’ to extend reach.
  - Across 24 posts on Facebook the total collective reach was to 44,037 users.
  - Average engagement across all posts totalled to 2.8%, well above industry standard (the industry standard for engagement is between 1.5-1.9%).

Details of what materials were sent to each industry are in Table 4. Each communication activity was individually monitored and evaluated to measure success and guide future activities.
Table 4. Detailed summary of communication activities carried out by AHA

<table>
<thead>
<tr>
<th>Industry</th>
<th>Industry body or direct business contacted (if no industry body)</th>
<th>Material sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpaca</td>
<td>Australian Alpaca Association</td>
<td>Link to Farm Biosecurity Alpaca page Industry newsletter article</td>
</tr>
<tr>
<td>Buffalo</td>
<td>Northern Territory Buffalo Industry Council, Australian Buffalo Industry Council of Australia, plus one direct business</td>
<td>18 posters and 90 fact sheets Industry newsletter article</td>
</tr>
<tr>
<td>Crocodile</td>
<td>Four direct businesses</td>
<td>2 Posters and 5 fact sheets each</td>
</tr>
<tr>
<td>Camel</td>
<td>Australian Camel Industry Association Inc., plus one direct business</td>
<td>15 posters and 50 fact sheets Industry newsletter article</td>
</tr>
<tr>
<td>Dairy sheep</td>
<td>Direct business</td>
<td>2 posters and 2 fact sheets Industry newsletter article</td>
</tr>
<tr>
<td>Dairy goats</td>
<td>Goat Industry Council of Australia</td>
<td>Emailed industry newsletter with link to dedicated goat industry page on the Farm Biosecurity webpage. Emailed article to Australian Goat World. Industry newsletter article</td>
</tr>
<tr>
<td>Deer</td>
<td>Deer Industry Association of Australia</td>
<td>20 posters and 100 fact sheets Industry newsletter article</td>
</tr>
<tr>
<td>Duck</td>
<td>Australian Duck Meat Association</td>
<td>Not contacted as instrumental in the creation of the Farm Biosecurity Manual for the Duck Meat Industry</td>
</tr>
<tr>
<td>Emu</td>
<td>Two direct businesses</td>
<td>5 posters and 25 fact sheets</td>
</tr>
<tr>
<td>Fibre goats</td>
<td>Goat Industry Council of Australia</td>
<td>Emailed industry newsletter with link to dedicated goat industry page on the Farm Biosecurity webpage. Emailed article to Australian Goat World. Industry newsletter article</td>
</tr>
<tr>
<td>Game birds</td>
<td>Direct business</td>
<td>2 posters and 5 fact sheets</td>
</tr>
<tr>
<td>Kangaroo</td>
<td>Australian Kangaroo Industry Association</td>
<td>Emailed industry newsletter and posters and fact sheets. Industry newsletter article</td>
</tr>
<tr>
<td>Marron &amp; Redclaw</td>
<td>Three Queensland Farmers Associations</td>
<td>2 Posters and 8 fact sheets each Industry newsletter article</td>
</tr>
<tr>
<td>Ostrich</td>
<td>Direct business</td>
<td>20 posters and 100 fact sheets (also EMU 10 posters and 50 fact sheets) Industry newsletter article</td>
</tr>
<tr>
<td>Rabbit</td>
<td>Direct business</td>
<td>2 posters and 5 fact sheets Industry newsletter article</td>
</tr>
<tr>
<td>Turkey</td>
<td>Australian Turkey Federation</td>
<td>20 posters and 100 fact sheets</td>
</tr>
</tbody>
</table>
Phase 4:

The short-term impact and change in awareness resulting from communications activities of this project was assessed by semi-structured interviews with producers or industry representatives from the targeted new, emerging and maturing industries. Participants were contacted from the original list of producers or industry representatives who had agreed to receive communication materials. An email was sent to potential participants, requesting their involvement in the project. If no response was received, a maximum of two follow up contact attempts were made, after which time it was assumed that the individual/organisation was not in a position to assist.

A short series of questions was developed that aimed to assess industry and producers’ perception on the usefulness of the newly developed messages and materials and the impact that these materials had or could have had on their awareness and practices. Participants were asked to provide comment on a number of aspects about the materials developed for the project and displayed on the ‘New and Emerging Livestock Industries’ webpage (but for their industry only). These included:

- Relevance of the content
- Clarity
- Usefulness
- Presentation - language, pictures
- Format
- Distribution method
- Potential of impact of materials on producer practices
- Impact of overall campaigns on producer awareness and practices

Participants who agreed to participate in the study were sent an email to arrange a time for the interview along with the link to the ‘New and Emerging Industries’ section of the Farm Biosecurity website. All semi-structured interviews were conducted over the telephone and recorded using an audio device. They were then transcribed and analysed qualitatively by performing a thematic analysis.
Results

Phase 1:

The initial phase of the research project undertaken by CSU identified and recommended 17 sectors of focus. In total 17 industry representatives were contacted to participate in semi-structured interviews. Of these representatives nine participated in semi-structured interviews, two indicated they were not in a position to assist the study and six did not respond to multiple attempts at contact.

Outcomes of the industry consultation at this phase suggested most identified sectors were not active participants in an existing biosecurity, EAD or animal health awareness and preparedness program. Further, biosecurity and EAD Watch Hotline awareness was low across many of the industries and biosecurity concerns tended to be sector specific. Identified biosecurity concerns included an inadequate traceability system, movement of animals between operations, and lack of biosecurity knowledge among small, medium, remote or free-range operations. The emergency and endemic diseases of concerns included FMD and Avian Influenza.

While all industries were supportive and engaged in this project, some indicated that biosecurity was not a priority. Other areas of focus included marketing, sustainability and development of the industry. One industry indicated it experienced low levels of disease and therefore biosecurity was not a major concern.

Industry representatives suggested that it would be difficult to contact producers who are not linked or associated with an industry body, in particular smaller scale producers. Industry consultation also indicated most sectors favoured information which was delivered in passive (email) and active (website) electronic formats.

The cross-sectional study of producers received completed questionnaires from 14 new, emerging and maturing industries. Members from these industries varied between production systems and reasons for producing livestock (i.e. hobbyist, part-time income or primary income). Although overall there was a moderate level of understanding of biosecurity across industries, the general understanding of biosecurity differed significantly between producers with some indicating no understanding and others a high level of understanding.

On-farm biosecurity practices were assessed by creating biosecurity scores for producers in FMD susceptible industries (alpaca, dairy goats and fibre goats). These were calculated using biosecurity practices outlined in Table 1. Across all three industries, the resulting biosecurity scores indicated varying levels of biosecurity practice implementation with most producers practicing at least five or more biosecurity measures, while some were implementing very few active biosecurity measures (Figures 1, 2 and 3).
The primary point of contact for unusual signs of disease varied between industries and producers. The majority suggested veterinarians or other producers and neighbours are the primary points of contact. Government organisations or industry bodies were less likely to be
the primarily contacted, with some producers indicated they would manage any animal health concerns themselves.

The cross-sectional study supported insight provided by industry representatives, which indicated EAD Watch Hotline awareness was low for these producers. In addition, awareness of the Farm Biosecurity program was low. Producers indicated they preferred to be contacted by email, newsletters and websites. A preference to receive information by seminars or workshops was also expressed by some participants. Few producers indicated newspapers were their preferred method of communication.

**Phase 2, 3 & 4:**

Communication materials were developed using both general and specific biosecurity messaging for new, emerging and maturing industries. After the completion of the communication and extension activities, CSU contacted 26 producers or industry representatives from 15 organisations for final interviews. Of the 15 potential participants who responded (to multiple contacts by the researchers), a total of eight were interviewed from five sectors (one alpaca, three buffalo, one camel, two crocodile, and one redclaw), see Table 5 for outcomes of these requests.

**Table 5. Outcome of request for participation of producers/industry representatives**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of representatives who responded and outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpaca</td>
<td>1 Interviewed</td>
</tr>
<tr>
<td>Buffalo</td>
<td>3 Interviewed</td>
</tr>
<tr>
<td>Camel</td>
<td>1 Interviewed - due to technical issues, some responses were sent via email</td>
</tr>
<tr>
<td>Crocodile</td>
<td>2 Interviewed</td>
</tr>
<tr>
<td></td>
<td>1 sent participation request to producers</td>
</tr>
<tr>
<td>Dairy Goats</td>
<td>Initial participation interest, but did not participate</td>
</tr>
<tr>
<td>Deer</td>
<td>Initial participation interest, but did not participate</td>
</tr>
<tr>
<td>Emu</td>
<td>Requested further information - no further contact</td>
</tr>
<tr>
<td>Fibre Goats</td>
<td>Suggested alternates</td>
</tr>
<tr>
<td>Redclaw</td>
<td>1 Interviewed</td>
</tr>
<tr>
<td>Ostrich</td>
<td>Initial participation interest, but did not participate</td>
</tr>
<tr>
<td>Rabbit</td>
<td>Initial participation interest, but did not participate</td>
</tr>
</tbody>
</table>

In general, participants indicated a positive increase in awareness was perceived to be achieved in the short-term, meeting the objectives of the project. Thematic analysis provided insight into the relevance and usefulness, presentation, dissemination and impact of the communication materials.

Interview participants found the provided resources varied in usefulness and relevance to their industry. All industries considered biosecurity awareness important however some participants considered it may not seem relevant to producers until a serious outbreak, such as FMD, occurs. To be considered relevant and useful, it was suggested examples of more common diseases should be used, for example internal parasites. The same biosecurity principles apply and using known biosecurity risks may provide a more relatable context for producers.
The key messages were acknowledged to be general, however this was not considered an issue on the posters or factsheets. One producer suggested that if more information was added to the factsheet it would become a “dry read”. Another producer considered the EAD section was too long and ‘bureaucratic’ suggesting dot points would be a better method of presentation. One producer recommended the inclusion of disease signs and symptoms to ensure producers are able to easily identify and report the disease.

In general, the videos were well received and topics considered relevant. However, it was suggested they could be better positioned on the Farm Biosecurity website to increase accessibility and tailored to be industry specific.

An objective of this project was to increase awareness on a producer’s responsibilities in reporting a notifiable disease as well as their role in responding to an EAD event. Some participants indicated they had displayed the provided posters with this information on their operation and felt they were useful. However, one participant expressed reluctance to display the EAD hotline number because of the possibility some employees may circumvent the existing organisational disease management protocols.

Overall, participants responded positively to the presentation of factsheets and posters. Insight was provided on small changes and nuances, such as species imagery and references, which could make the materials more appealing to a specific sector. It was also suggested the poster be available in PDF format on the Farm Biosecurity website.

Platforms for dissemination included the Farm Biosecurity website, industry newsletters or magazines, regional and rural radio or newspapers, AHA social media platforms and materials sent to producers directly by an industry contact (Table 4). However, a number of participants had not come across the material independently prior to being contacted for the interview. These participants also considered it unlikely that they would have found the materials on the Farm Biosecurity website independently. After exposure to the materials at the interview, some participants expressed interest in disseminating this information afterwards.

Social media was considered to be a useful tool. Additionally, it was noted electronic dissemination of material is very effective and many producers are moving to embrace new technologies. However, it was acknowledged that social media informs a particular segment of the industry and the value of communication in person, for example by rangers, should not be underestimated.

The perception of impact was used to measure change in the short-term. There was only a period of two months between the completion of the communications plan and the final interviews. Additionally, a low number of producers or representatives participated in the final interviews (as some did not respond to multiple contacts). The perception of impact should therefore be viewed with some caution. Most producers considered the project to be a valuable initiative in the overall promotion of biosecurity awareness and another part of the “tool box”. It was cautioned that within an industry differences exist and, while not directly applicable to this communication material, some producers would not engage if they feel the messages “do not talk directly to them”.

The CSU research team was limited by the timeframe of the project and was unable evaluate the long-term impacts. This would be a useful exercise in similar future projects.
Implications

For future communications with new, emerging and maturing industries:

These industries can be difficult to contact. Where present, industry bodies should be utilised for helping develop communications for these industries. Messaging should be more personalised to each industry to account for differences between preferred methods of communication.

The difficulty will be in reaching those producers that have no linkages to industry (e.g. membership of an industry body), particularly as these often smaller producers have been highlighted as potentially posing a significant biosecurity risk to the whole industry.

For producers from these industries/ the industries as a whole:

This project provided new insight into the state of biosecurity awareness of these industries, which suggests further engagement /extension is required to facilitate the increased adoption of best-practice relevant to them.

Engagement with industry participants provides the opportunity for producers to be responsible if an EAD event occurs, improve market access and protect animal health in their operations. Effective biosecurity practices can assist producers by reducing unnecessary production costs associated with the presence of diseases, pests and weeds.

It was perceived some increase in biosecurity awareness occurred for producers in Australia’s new, emerging and maturing industries. If adopted, the practices promoted by this project will benefit the identified industries by protecting and preserving the animal health in these operations and potentially protecting market access.

For the Australian livestock industry:

Australia’s market access and livestock industries, both mainstream and emerging, benefit from collective biosecurity measures. This project provides a first step in engaging Australian producers who can improve on current biosecurity practice, thus improving the overall biosecurity status of Australian livestock industry.
Recommendations

Where they exist for an industry, representative bodies should be used for the dissemination of information on biosecurity and emergency animal disease. If possible, consultation about the messaging with industry representatives prior to the dissemination of materials would be a useful extra step for future communication plans to resolve some of the identified issues. It can be difficult to contact industry representatives or producers, so plenty of time to do so should be included in future communications efforts.

As some of these industries haven’t had much experience with biosecurity previously, it may be beneficial to provide more basic biosecurity messaging in future to help producers understand what biosecurity is and then build upon this. Finding producers who are already carrying out biosecurity practices on their farm and sharing their story with others in the industry (through articles or videos) may also be valuable in future.

It may also be beneficial to communicate examples of EADs impacting on other industries – for example, sharing the story of FMD in the UK or closer to home the Equine Influenza outbreak sequence of events and economic impacts. This may assist producers in these industries, who haven’t experienced a serious EAD outbreak, to realise how important biosecurity is and its relevance to them.

For industries who feel biosecurity is not a priority for them compared to issues such as marketing and sustainability, it would be worth developing messaging that shows the relationship between these issues and biosecurity or develop a narrative that clearly sets out the relationships between biosecurity practices across industries.

It is recommended that a variety of communication materials should continue to be disseminated to these industries to increase the number of producers reached with the communications. It may also be worthwhile to consider alternatives to digital collateral to address the challenge of reduced internet connectivity among some producers.

Specific to this project, the video material on the Farm Biosecurity website should be moved to improve accessibility and the posters made available in a PDF format.

Future communications to new, emerging and maturing livestock industries should aim to provide both general biosecurity messaging as well as some industry specific or targeted messaging to account for nuances in the different production systems.

If the objective of future projects is to measure the long-term impact of communications it is suggested the timeframe is adequate to accommodate final analysis.
Appendices

Appendix 1: Biosecurity and EAD awareness campaign collateral.