Passive livestock disease surveillance to support emergency animal disease preparedness in Southern Tasmania

A Surveillance Champions project

Final report

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Table of Contents

Tables

Acknowledgements

Definitions and Acronyms

Executive Summary

1. Introduction
    - 1.1 History of passive surveillance in Southern Tasmania
    - 1.2 History of project
    - 1.3 Project aims

2 Methodology

- 2.1 Evolution of model
- 2.2 Initial workshop
- 2.3 Large commercial producers
- 2.4 Smallholders
- 2.5 Final workshop and service provider feedback

3 Results

- 3.1 Condition reporting
- 3.2 Service provider engagement
- 3.3 Smallholder workshops
- 3.4 Report distribution

4 Discussion

- 4.1 Meeting the project aims
- 4.2 Cost efficient surveillance
- 4.3 Smallholders
- 4.4 Potential service provider partners
- 4.5 Coordinator success factors
- 4.6 Potential distributers of the report
- 4.7 Sustainable funding of passive surveillance systems

5. Conclusions

6. Recommendations

7. References.

8. Appendix

Tables

Table 1: Summary of the number of different conditions reported for each species and also the minimum number of total reports of all conditions for that species from August 2018 to July 2019.

Table 2: Number of immediate contacts with Coordinator by Rural Service provider category.

Table 3: Number of immediate contacts with Coordinator by species.

Table 4: Livestock Health Report distribution through the Red Meat Updates Facebook page

Table 5: Livestock Health Report distribution through the Red Meat Updates web site

Definitions and acronyms

ASF: African Swine Fever

Condition: a disease, deficiency, injury, infestation or other detectable abnormality in livestock.

CPD: Continuing Professional Development

DAWR: Department of Agriculture and Water Resources

DPIPWE: Department of Primary Industries Parks Water and Environment

EAD: Emergency Animal Disease

FMD: Foot and mouth disease

NRM: Natural Resource Management

NLIS: National Livestock Identification System

NVD/LPA: National Livestock Declaration/Livestock Production Assurance

TFGA: Tasmanian Farmers and Graziers Association

Acknowledgements

DAWR for funding the project, DPIWE for administering the project and Rhyll Vallis (DAWR), Rowena Bell, Emma Watkins and Mary-Lou Conway (DPIPWE) for their support.

Macquarie Franklin for publishing reports on the Red Meat Updates Facebook page and the Red Meat Updates Committee for inviting a presentation at Red Meat Updates conference 2018.

NRM South, Tim Ackroyd, for running the smallholder Healthy Sheep and Healthy Pigs workshops and Barry Calderbank, Peter Ball, Colleen Stewart and experienced local farmers for presenting at the workshops.

Most importantly, the rural service providers and producers for all their input to the workshops and monthly data collection for the monthly report.

Executive Summary

A DAWR sponsored, DPIPWE administered Surveillance Champions passive EAD surveillance pilot project was conducted in Southern Tasmania from August 2018 to July 2019.

The aims were to develop and trial a pilot passive surveillance program that:

- could provide early warning that an emergency animal pest or disease had entered the Southern Tasmania region, with an emphasis on reporting of disease in sheep.
- could strengthen claims of disease freedom for trade purposes
- is useful to the people gathering the information and has potential to become self-sustaining.

Rural service providers such as rural merchandisers, sheep contractors, shearing contractors, consultants and rural veterinarians as well as a small number of producers reported livestock diseases and conditions every month to an experienced and EAD-aware veterinarian coordinator who then summarised the results and re-distributed the reports to participants. Originating farm identity remained confidential.

Fifty of these reports were made while on the farm or soon after, often accompanied by photographs. These were usually when the rural service provider was not sure of the diagnosis and, if any of these had been due to an EAD, would have resulted in a rapid response. No EADs were suspected during this project.

Over 430 incidents of diseases and conditions affecting sheep (307), cattle (69), goats (20), pigs (12) alpacas (8), and deer (1) were reported over the 12 months of the project.

Two sheep and one pig Healthy Livestock workshops were conducted in conjunction with NRM South within the smallholder sector in an attempt to uncover rural service providers for this sector but no such networks were revealed.

Recommendations for future action are:

(a) Further expand and develop the rural service provider model of surveillance for EADs in regions where passive surveillance via other methods appears to be deficient, including mentoring/support for veterinarians that are prepared to do production animal work but work in practices that do not have experienced production animal veterinarians.
(b) Develop and maintain a high quality basic livestock health and husbandry web site for smallholders with links to reliable information incorporating EAD prevention (awareness of bans on swill and RAM feeding) and EAD reporting messages. Ensure that the web site will appear high on the list after appropriate internet searches are conducted and promote vigorously to the smallholder sector.
(c) Attempt to establish Small Farms Networks in high-risk smallholder areas such as small rural towns and adjacent to larger commercial farming areas, possibly starting with offering Healthy Livestock workshops.
(d) Strengthen the current passive surveillance mechanisms within Tasmania by:
    - improving EAD recognition and response training of Biosecurity Tasmania staff attending livestock sales
    - training abattoir and slaughterhouse staff in EAD recognition and reporting
    - provide alternative EAD training and awareness for veterinarians who cannot attend training weekends, especially those providing services in smallholder areas.

1 Introduction

1.1 History of passive surveillance in Southern Tasmania

During the 1970s and 1980s the state Department of Agriculture supported a combination of regulatory and production support services for livestock in Southern Tasmania. District Veterinary Officers and District Agronomists were stationed at Oatlands, New Norfolk, Huonville, and Sorell. Stock Officers (usually at least two per office) mainly performed regulatory functions, enforcing the sheep body lice, hydatids, vertebrate pests and weeds legislation. Veterinary Officers at New Norfolk and Oatlands provided a subsidised clinical service and all District Veterinary Officers provided a herd and flock disease outbreak investigation service including field necropsy and laboratory testing at no cost to the owner. Officers generally lived in the local town and mingled with local farmers socially.

The thrice daily Hobart to Launceston bus service accepted veterinary samples (appropriately packed). It was easy to get samples to the Animal Health Laboratory in Launceston and testing on production animal samples was free, thus laboratory confirmation of clinical diagnosis was more frequent.

All sheep and cattle sales were attended by Stock Officers and all pens were inspected for signs of disease. A lot of disease intelligence was exchanged over morning tea or lunch in the saleyard canteen and Stock Officers often built strong communication links and working relationships with livestock agents, livestock carriers and saleyard staff.

A number of local slaughterhouses operated in Southern Tasmania and Stock Officers conducted regular inspections and responded to queries from operators. Several abattoirs also operated with state department inspectors.

This provided a high degree of passive surveillance at that time but due to changes in government policies is simply not feasible now.

There are now no state department staff stationed in small towns in Southern Tasmania and one (mainly policy) Veterinary Officer stationed in a suburban office in Hobart. Stock Officers, now employed as generalist Biosecurity Officers, may attend some of the small number of store sheep sales at Oatlands and some annual cattle sales at Bothwell, but have a primary focus on animal welfare compliance and are therefore not welcomed onto farms or frequently contacted by farmers or rural service providers. Livestock agents at saleyards will be reluctant to report suspected EADs to regulatory authorities as a false alarm would result in disruption to the sale. If a vendor was quarantined as a result of the report this would result in a loss of goodwill between the agency and the vendor.

Most local saleyards have since closed and sheep and cattle are transported to Northern Tasmanian saleyards for weekly auction sales, many of which are not attended by Stock Officers. Many producers sell livestock on Gumtree, Auctions Plus or consign direct, often to mainland abattoirs, to avoid paying freight to Northern Tasmania. Animals from various properties are usually “boxed up” en route to mainland abattoirs and may spend a number of days in holding yards and spelling paddocks prior to slaughter, so conditions with short incubation periods would be hard to trace back to source quickly.

Veterinarians employed by Veterinary pharmaceutical companies visit Southern Tasmania regularly to support rural merchandising staff and advise on internal and external parasite control, vaccination

and other disease issues relating to use of their veterinary products. To some degree this has displaced local veterinary practitioners and veterinary consultants.

The bus service will now not accept veterinary samples and veterinary practitioners are required to send samples by courier or by Express Post (overnight delivery). Veterinarians often elect to send samples to an interstate laboratory along with small animal samples, as commercial laboratories provide more convenient same-day courier options.

In Northern Tasmania producers often load affected animals or carcases onto a ute and drop them off at the Launceston Animal Health Laboratory for necropsy. This means that they avoid the costs of a visit from a practitioner. In Southern Tasmania transporting affected animals or carcases to Launceston is far less convenient and producers rarely do this.

The DPIPWE Animal Health Laboratory charges for most testing on production animal samples apart from those tested under the National Significant Disease Investigation program and cases where there is suspicion of an EAD. Even though testing costs are subsidised for production animals, charges are still regarded as significant by producers and represent a disincentive for producers to have testing carried out.

Many properties in Southern Tasmania now only run sheep due to a succession of dry years and difficulty in providing sufficient long feed for cattle. This represents a risk of late diagnosis of FMD as clinical signs in sheep are usually subtle whereas clinical signs in cattle are more likely to attract attention.

As irrigation water becomes more available in Southern Tasmania, many sheepmeat producers are irrigating pastures and finishing prime lambs. This means that store lambs are constantly entering the district from all over Tasmania, and some producers feel that this represents a greater risk than smallholders.

The Bass Strait Freight Equalisation scheme means that producers now readily introduce large groups of commercial livestock from the mainland compared to some years ago when cattle were quarantined, which resulted in only a small number of stud cattle and rams being imported.

In some intensive grazing districts such as North-West and North-East Tasmania, veterinary practices based on servicing dairy and intensive beef cattle enterprises have been maintained, experienced production animal veterinarians are working on farms every day and the chance of early detection of an important EAD such as FMD is more likely. However, in Southern Tasmania many practices do not service production animals, few would claim to have veterinarians mainly employed to service production animals and none would claim to employ a veterinarian who was very competent in sheep medicine.

Smallholders represent a heightened risk of EAD introduction, non-recognition of a suspect EAD and ignorance of reporting pathways. There are many smallholdings in Southern Tasmania, particularly in the Huon Valley, Tasman peninsula, Derwent Valley, Coal Valley and around a number of small towns in the region. Many smallholders are reluctant to make contact with regulatory authorities as they may engage in activities such as home kill and local sale of meat which they know are illegal. Many smallholders prefer to use non-traditional or complementary treatments for conditions seen in their animals and therefore do not involve veterinarians. The expense of veterinary practitioner visits may also be a barrier.

Smallholders in mainly smallholder areas such as the Huon may actually represent a reduced risk of widespread dissemination of EADs. They rarely send livestock to saleyards and fomite spread is also

probably reduced, leaving neighbour to neighbour spread most likely, giving more time for detection and reporting before the disease spreads to large numbers of susceptible species.

Smallholders may be more likely to represent a heightened risk where they exist close to larger commercial farms. In particular, smallholders in small rural towns may represent the highest risk as the residents on those small farms may also work on commercial properties as well as running similar susceptible livestock on their smallholding.

Air travel is now much cheaper than in the past, and many Tasmanian residents who have contact with susceptible species travel overseas through regions where animal diseases such as FMD and ASF are endemic.

The University of Tasmania has a significant overseas student population and national immigration policy has resulted in many more immigrants residing in Southern Tasmania. Many of these students and immigrants are from countries where EADs are endemic. Students may not be aware of our quarantine requirements and may accept parcels containing food products from their overseas relatives or attempt to bring at risk materials in with them when they return from overseas.

Thus the risk of an EAD incursion has increased while passive surveillance in Southern Tasmania has been limited or reduced, particularly within the sheep industry and smallholder sectors, resulting in an increased risk of late detection of an incursion of an EAD.

1.2 History of project

In 2017 DAWR offered all States funding to set up a Surveillance Champions surveillance project to increase the chances of early detection of EADs.

DAWR commenced discussions with Biosecurity Tasmania in regard to the Surveillance Champions concept.

Late in 2017 a program concept had been agreed on and a Surveillance Champion identified and the Livestock Health Monitoring pilot project commenced in Tasmania in August 2018.

1.3 Project aims

- Develop and pilot trial a passive surveillance program that:
    - could provide early warning that an emergency animal pest or disease had entered the Southern Tasmania region with an emphasis on reporting sheep disease.
    - could strengthen claims of disease freedom for trade purposes
    - is useful to the people gathering the information and has the potential to become self-sustaining.

2 Methodology

2.1 Evolution of model

Initial discussions with a production animal veterinary consultant in regard to improved on-farm surveillance and reporting did not proceed because the veterinary consultant did not have enough time to set up the system.

Direct reporting from farmers to a Surveillance Champion was considered but did not proceed due to the realisation that a very wide network of producers would be required and could interfere with existing practitioner-client relationships.

The concept of rural service providers reporting confidential/anonymous information to a trusted Surveillance Champion in return for advice was then developed and formed the basis of this program. Part of the basis of this concept was to distance regulatory personnel from the information gathering and reporting network and to use familiar language and existing networks. Thus the term "coordinator" rather than "Surveillance Champion" was used in communications with the service provider network, and will be used from here on in this report.

The concept was 'bounced off' a number of livestock industry players, and it was decided to become a sponsor for Red Meat Updates, a Meat and Livestock Australia/industry one day conference held in July each year in Launceston. Over 300 livestock producers and rural service providers attend this conference each year. The Coordinator made a presentation on biosecurity incorporating the rural service provider concept to garner some feedback. The feedback from attendees was positive so it was agreed to proceed with that concept.

A number of service providers were identified through the Coordinator. These were mainly an existing network that had contacted the Coordinator from time to time for veterinary advice over a number of years.

A small number of veterinary practices that contained veterinarians that were keen to service production animal owners but did not have access to an experienced senior veterinarian for advice on more challenging cases were also included.

Two older and one younger producer were also included to see whether farmer networks would produce a different range of reported conditions compared to rural service providers or veterinarians.

A senior livestock agent from one of the main livestock agent firms was approached to participate but did not want to become involved.

Involving livestock carriers was considered but the 'fit to load' issue was considered a significant barrier to involvement so none were approached.

The term "service provider" will be used to cover the rural service providers, producers and veterinarians who provided monthly reports to the Coordinator on conditions they had observed or had been informed of by trusted contacts. The term "conditions" will be used to cover all clinical presentation that a service provider regarded as worth reporting. This includes infectious disease, deficiencies, parasitism, toxicities, congenital abnormalities, under-nutrition and management induced morbidities. "Conditions" rather than "syndromes" (as used in the National Disease Investigation Program) were used as standard terminology for this project because service providers use the word conditions day-to-day and people reading the reports also relate to "conditions" rather

than “syndromes”. The conditions could be re-classified under syndrome headings later if necessary.

A letter was sent to all prospective service providers outlining how it was envisaged that the project would work, but also inviting their input into developing an effective system.

Non-veterinary service providers were offered a monetary incentive to be involved but several declined, preferring to accept the veterinary advice as sufficient recompense for their input.

2.2 Initial workshop

The service providers were invited to a short workshop. Most categories were represented though all participants could not attend on the day.

The proposed service provider model was accepted for the large commercial producer sector but it became clear that a different model would be required for the smallholder sector.

A number of smallholder options were considered including a website, hotline or field days. Resources to develop a comprehensive website or to monitor a hotline 24/7 were not available, so it was subsequently decided in discussions with NRM South to hold a series of animal health and husbandry workshops for smallholders.

2.3 Large commercial producers

In this project a rural merchandising agent, a sheep contractor, a shearing contractor, an agricultural advisor, two more experienced sheep producers, one young sheep producer and five veterinarians were contacted by the Coordinator at the end of every month. Their monthly reports could be made via text on a mobile phone, emailed or provided by telephone, but were designed to be informal and easy to provide. Most just listed the conditions that they had seen, some were more specific as to region and numbers affected but this level of detail was not insisted on.

Also included in the reports were conditions observed by the Coordinator on farm visits and cases reported by other producers who contacted the Coordinator for advice.

At any time the service provider could ring, text or email the Coordinator to discuss a case. Service providers were encouraged to send photos. The Coordinator regarded responding to these queries as a high priority and would send back a suggested diagnosis (or short differential diagnosis list), suggestions for treatment/management and suggested actions that could result in a more accurate diagnosis. If appropriate, referral to a veterinarian was recommended. Each case was also assessed for EAD risk. If a reasonable risk of an EAD had been entertained by the Coordinator (an experienced ex-DPIPWE veterinarian who had attended several AAHL emergency animal disease recognition courses, and had also worked in Africa for four years), then an appropriate response would have been initiated.

This information was listed under providers name in an Excel spreadsheet for that month and a summary report produced as a table in Word, listing the condition, some indication of extent (numbers affected, geographic spread), some remarks about the condition to assist readers of the report to identify cases themselves and some brief details on diagnosis, treatment and prevention. See http://www.tasanimalhealth.weebly.com/ for the format of the reports.

Later in the project, information from the sheep disease monitoring abattoir in Tasmania was also included in the report.

These monthly summary reports were released by the middle of the subsequent month and sent back to the service providers who were encouraged to circulate it as widely as they liked. A copy was also sent to Macquarie Franklin, a consultancy firm that administers Red Meat Updates, and the report was released on the Red Meat Updates Facebook page, usually with a featured "condition of the month" with additional photographs and information.

2.4 Smallholders

A series of three smallholder workshops were held, two for sheep producers (Huonville and Tasman peninsula) and one for pig producers (Cygnet). Surveymonkey surveys were conducted before the workshops and also paper-based feedback sheets filled in by most participants at the end of the workshops, providing valuable information on how smallholders like to receive information. These workshops were promoted as providing information that smallholders needed but key messages about important biosecurity program such as swill feeding, restricted animal material, hotline reporting of suspicion of emergency animal disease and general biosecurity were also delivered.

2.5 Final workshop and service provider feedback

Participants in the reporting network were invited to an end of project workshop and a representative sample attended. Feedback was received on what worked well, what could be improved, how widely the reports were distributed and whether participants would like the program to continue.

Those that could not attend were contacted individually after the workshop and asked the same questions.

3 Results

3.1 Condition reporting

At least 430 reports of conditions were made over the 12 month time span of the project. See http://www.tasanimalhealth.weebly.com/ to view all reports.

Due to the format of reporting, no attempt was made to estimate how many individual animals or properties were involved. For instance, virulent footrot was mentioned every month by at least one participant but the number of infected properties was probably fairly constant while the number of affected sheep would peak in late spring and be lowest in late summer. Nevertheless, these reports underline the ongoing presence of the disease and the fact that experienced rural service providers are examining a lot of sheep's feet and would contact the Coordinator if they found lesions not typical of footrot or some other common foot ailment.

Table 1: Summary of the number of different conditions reported for each species and also the minimum number of total reports of all conditions for that species from August 2018 to July 2019.

Species	**sheep**	**cattle**	**goats**	**pigs**	**alpacas**	**deer**	**poultry**
Number of conditions	112	41	17	8	8	1	0
Minimum number of reports	307	69	20	12	8	1	0

See appendix 1 for a summary of the conditions reported in each species.

Surveillance reporting on avian species remains very poor in the smallholder sector (including backyard flocks on large commercial farms).

Service providers and producers contacted the Coordinator immediately by email, text or mobile phone in regard to fifty cases over the 12 months, some accompanied by photographs. None of these cases were deemed suggestive of an EAD and worthy of an EAD investigation. Involvement of a rural veterinarian was suggested in a number of these cases but there are no records of how many cases were subsequently attended by a veterinarian. Two sheep cases attended by veterinarians resulted in a brain being submitted under the transmissible spongiform encephalopathy surveillance project (TSESP).

The breakdown is presented in the tables below:

Table 2: Number of immediate contacts with Coordinator by Rural Service provider category.

Category of service provider	**Number of contacts with Coordinator**
Rural merchandiser	21
Rural veterinarian	18
More experienced producer	2
Young producer	2
Other producers	14
Sheep contractor	3
Total	**50**

Table 3: Number of immediate contacts with Coordinator by species.

Species	Number of contacts with Coordinator
Sheep	45
Cattle	5
Goat	5
Pig	4
Alpaca	1
Total	**50**

3.2 Service provider engagement

The only livestock agent that was approached did not want to be involved in the project.

Some service providers were very active and provided a comprehensive list of conditions every month and frequently consulted on individual cases during the month. Others required repeated contacts to obtain monthly reports, usually because they did not have a lot to report.

Receiving payment did not appear to be correlated to level of engagement and it was clear that access to credible and timely advice on individual cases was valued by engaged service providers.

The Coordinator was a semi-retired ex-departmental veterinarian who had spent the first 10 years of his career in mixed and production animal clinical practice, three years of which was spent in Southern Tasmania. Service provider trust in the Coordinator was very important as service providers needed to be very confident that producer identity would remain confidential. The quality, credibility and timeliness of veterinary advice were also important factors in the Coordinator/service provider relationship.

Feedback from service providers indicated that separation from the animal health regulatory system was important. Producers are usually very concerned about neighbours, livestock agents and regulatory authorities knowing about disease occurrence on their properties as this can affect marketing opportunities, general reputation and social standing in the community. The last thing any producer wants to risk is a quarantine sign on the front gate and regulatory staff in white overalls seen coming onto and off the property. This factor, combined with the cost of getting a veterinary practitioner onto the property, the cost of laboratory diagnosis and the risk that these expenses may be incurred but a diagnosis still not reached, result in many conditions not being reported to veterinary practitioners or state animal health authorities.

Service providers valued the monthly reports as a means of being aware of what conditions were currently presenting in the region, how to recognise them and how to deal with them. Some service providers used the reports to show producers that the problem on their property (e.g. sheep body lice) was common and encouraged them to communicate and coordinate with neighbours to manage the problem in the local area rather than to feel embarrassed and try to conceal the problem from neighbours.

The reports were also used to assist property owners to feel that they were 'not alone' in dealing with outbreaks of disease, and that many other producers were also dealing with the same or similar problems.

Some more experienced producers felt embarrassed to ask a veterinary practitioner directly about a condition that they felt that the veterinarian may see as common and be surprised that the producer could not recognise it themselves.

3.3 Smallholder workshops

NRM South delivered a series of low-cost 'Healthy Livestock' workshops designed to improve on-farm biosecurity practices amongst small holders and to determine how best to gather livestock disease information from smallholders.

Three on-farm workshops were delivered, one on pigs and two on sheep with a total of 46 participants. As part of the workshop registration and evaluation process, participants were asked to complete an anonymous online survey and a workshop feedback form which asked them a series of questions around livestock health and management.

Survey results showed that 88% of respondents identified as hobby farmers, and 12% as farmers. Respondents said they sought their livestock management information most commonly from the internet, followed by veterinary surgeons. A network of well-used smallholder service providers was not demonstrated.

Feedback indicated that the workshops helped improve all participants knowledge and skills in livestock management with 100% either agreeing or strongly agreeing that they'd use the information from the workshop to manage their property and that 93% of respondents would like to improve their knowledge further with 82% prepared to pay for this service.

These workshops did succeed in educating small holders about important national animal health programs and reporting, but in themselves did not result in a significant amount of current condition reporting.

This pilot program demonstrated that a low-cost workshop training model is one of the most effective ways to educate smallholders in improved biosecurity practices and that the internet and veterinary surgeons may be the best avenues for surveillance gathering.

See appendix 2 for a full report on the smallholder workshops

3.4. Report distribution

Monthly reports were provided to DPIPWE, DAWR, all service providers involved in the project, Macquarie Franklin (Red Meat Updates) and TFGA.

DAWR set up a web site where all reports were published as they were released by the coordinator. This site had ten hits per month during the life of the project. Recently a Facebook page was also set up and had 20 hits in its first month.

Most service providers printed off some hard copies and used these in discussions with clients when appropriate, usually about a dozen times each month.

One more experienced producer sent the report to about 20 other producers in his district.

Veterinarians were very interested in what conditions were currently occurring in the region and distributed the report to other veterinarians in the practice.

DPIPWE alerted all registered veterinarians in Tasmania to the existence of the report and provided a link to the web site.

Macquarie Franklin published most reports on the Red Meat Updates Facebook page, featuring a "condition of the month" and appending the full report.

Table 4: Livestock Health Report distribution through the Red Meat Updates Facebook page

FACEBOOK (RED MEAT UPDATES – TASMANIA)	Total people reached	Post engagements	Post shares	Link clicks
March 2019	190	13	2	4
February 2019	227	19	0	11
January 2019	538	35	0	11
December 2019	174	16	0	7
November 2018	402	26	1	10
September 2018	204	31	0	22
August 2018	556	69	1	33

Table 5: Livestock Health Report distribution through the Red Meat Updates web site.

WWW.REDMEATUPDATES.COM	Page views
March 2019	48
February 2019	27
January 2019	42
December 2019	29
November 2018	34
September 2018	FB only
August 2018	FB only

These statistics might appear low in terms of shares and link clicks but they are actually quite good compared to other posts on the Red Meat Updates page.

Red Meat Updates has a bigger following on Twitter than Facebook but unfortunately statistics could not be extracted.

TFGA felt that the report was not suitable for distribution via their usual communication channels such as the TFGA fortnightly email newsletter, but that a feature 'condition of the month" and a link to the web site may be feasible in the future.

A number of service providers felt that a newsletter format plus a link to the website housing the full report would be the most useful way of distributing the report.

4. Discussion

4.1 Meeting the project aims

The project had mixed success in achieving its aims.

- *Develop and pilot trial a passive surveillance program that could provide early warning that an emergency pest or disease has entered the Southern Tasmania region with an emphasis on reporting sheep disease.*

This aim was fulfilled for the large commercial sector but not for the smallholder sector.

A system involving rural service providers reporting confidential/anonymous intelligence on disease occurrence to a non-regulatory coordinator can provide an economical early detection system in the large commercial sector. This pilot trial could be expanded geographically and also could include some other categories of rural service providers.

The real strength of this system was that communication channels were maintained between on-farm rural service providers and an experienced non-regulatory veterinarian with sound EAD awareness. This created an environment where rural service providers would be more likely to request information from the veterinarian if they became aware of conditions that they did not recognise.

The smallholder sector remains a challenge. The information collected during this project indicates that a high-quality, well-maintained livestock health and husbandry website that catered for smallholders with little basic knowledge, preferably linked to a telephone or email advisory service or a hotline manned by very broadly experienced production animal veterinarians for a good part of each day could fulfil this role but would be expensive to set up and maintain. Significant effort would need to be made in promoting the website to the target audience and ensuring that it came close to the top of the list when appropriate internet searches were made. EAD training and technical support/mentoring for veterinary practitioners servicing smallholder areas would also be valuable.

Running a series of animal health and husbandry workshops in higher risk areas such as small rural towns and smallholder areas close to larger commercial farms may result in the formation of local Small Farm Networks (NSW Government 2019) which have been shown to be effective in promoting good biosecurity and could possibly be harnessed for reporting

"It is axiomatic that disease control programmes cannot operate effectively without surveillance, and good management decisions require good surveillance data." (Morris and Jackson, 2005, p7). The effectiveness of EAD preparedness and response arrangements will be greatly reduced by late detection of an EAD incursion. Cost-effective early detection programs should reduce the potential for wide dispersion, increased costs and the risk of failure to eradicate incursions of EADs

- *Develop and pilot trial a passive surveillance program that could strengthen claims of disease freedom for trade purposes*

DAWR staff have indicated that the data emanating from this project would probably not be accepted as evidence of disease freedom, but the existence of the system itself with involvement of veterinarians experienced in EAD diagnosis could strengthen claims of disease freedom.

- *Develop and pilot trial a passive surveillance program that is useful to the people gathering the information and has potential to become self-sustaining.*

The pilot program has demonstrated that the reports are valued by the rural service providers collecting the data, but it remains to be proved that the system can become self-sustaining.

4.2 Cost-effective surveillance for early Emergency Animal Disease detection

It is most important that a Surveillance Champion surveillance program complements existing passive surveillance systems.

Currently Biosecurity Tasmania staff attend some livestock sales. It is important that these staff are well-trained in EAD recognition and inspect every pen of livestock for signs of disease as well as checking NLIS tagging requirements, NVD/LPA compliance and animal welfare. Ideally every sale would be attended.

State registered domestic abattoirs and slaughterhouses in Tasmania are required to report any suspicion of an EAD but I am not aware of any EAD recognition training of abattoir or slaughterhouse staff who carry out the pre-mortem and post mortem inspections.

First detections of EADs at abattoirs are relatively common, for example the UK 2001 FMD outbreak, and also in Zimbabwe (Hargreaves, pers. comm.). Even though this may be regarded as 'late' detection, it is still better than further delays in mounting an eradication or control effort.

Well-trained and aware veterinary practitioners who readily communicate with state animal health regulatory personnel are also critical to early detection. Veterinary practitioner training weekends are offered from time to time but not all practitioners are able to attend. Alternative EAD awareness training could be investigated, perhaps on-line courses with an emphasis on good descriptions and high quality photographs of EADs that qualified for Continuing Professional Development (CPD) credits.

Any actions that encourage submissions to animal health laboratories also strengthens the overall passive surveillance system.

Surveillance Champion surveillance programs should not interfere with existing systems of passive surveillance, especially in relation to replacing veterinary practitioner farm visits, and should, if possible, encourage veterinary practitioner visits where these are likely to be beneficial to the producer as well.

It is tempting to believe that a system can be developed where all producers are constantly aware of the risk of an EAD and will ring the EAD hotline every time they observe some clinical signs that could be an EAD. A small number of well-trained response staff then investigate these incidents. In reality producers are very preoccupied with running their enterprises and do not welcome the disruption and likely loss of reputation and markets that an investigation would bring. So they tend not to "think the worst first", but prefer to ignore conditions that are not harming animal production in an economically significant manner at the time.

The best passive surveillance systems are based on activities that are existing, bring direct benefit to all the participants, and do not disrupt day-to-day operations. These are also likely to be the most economical. Thus rural service providers who can just get on with their job and are prepared to immediately refer anything unusual confidentially to a well-trained and experienced non-regulatory veterinarian are an ideal group to work with.

Some EADs do not present as causing significant production loss (for example, FMD in sheep) and it is likely that many producers would not report on the EAD hotline or call in a veterinary practitioner unless they had a high level of awareness of clinical signs and the importance of early reporting, but such conditions could be observed by, or mentioned to rural service providers.

4.3 Smallholders

It may be possible to run a series of Healthy Livestock workshops for smallholders and to greatly enhance awareness of preventative programs such as swill and RAM feeding, as well as suspected EAD reporting channels. Establishing a flow of surveillance data on mostly endemic conditions will be difficult in the absence of well-used service providers.

Establishment of small farm networks (NSW Government, 2019) may result from running workshops as local producers get to know each other better. Small farm networks have been shown to be effective vehicles for enhanced biosecurity practises amongst smallholders.

Morris (2012) reported that 73% of respondents to a survey of smallholders in Northern Tasmania use the internet as a first port of call when in need of information, which corroborates the analysis of the smallholder workshop surveys undertaken as part of this project. Establishment of a basic animal health and husbandry web site for smallholders would have significant establishment costs but when viewed as a long-term project, could be cost-effective. There would be some ongoing maintenance costs to keep the site current. Maintaining a network of veterinarians who respond to emails or phone calls linked to the web site may be more costly but it is possible that retired veterinarians may carry out such a function at reasonable cost. Local practices may also be prepared to carry out that function as it may create goodwill and result in more business for the practice. Otherwise, repeated reference to the EAD hotline number would have to be sufficient.

Efforts to bring smallholders into the reporting network may need to be prioritised and targeted. Smallholders in rural towns and in areas adjacent to large commercial farming areas may represent a greater risk of rapid disease spread if introduced and limited resources should perhaps be targeted at these areas first.

4.4 Potential service provider partners:

Depending on the species mix and individual regional peculiarities, a number of different service providers may be prepared to become involved. The critical factor will be whether the Coordinator already has a working relationship and a high level of trust with these providers, or can quickly develop a trust-based reciprocal arrangement.

Rural merchandising agents, especially staff that deliver product to properties, including stores specialising in smallholders such as Animal Tuckerbox.

Sheep contractors (mustering, drenching, crutching, lamb marking/mulesing, vaccinating, footrot paring, pregnancy scanning)

Rural Veterinarians

Pet meat suppliers who collect cattle, sheep and horses on-farm for processing.

Agricultural Consultants

Shearing contractors , shearers, wool classers and roustabouts

Small flock shearers

Saleyard managers and staff

Slaughterhouse operators and staff

NRM field operatives

Feed and supplement suppliers and deliverer personnel

Sheep artificial breeding veterinarians and contractors

Sheep classers

Livestock buyers

Abattoir “scale” operators

Wool buyers

Contract calf dehorners

Cattle AI technicians

Livestock carriers

Milk tanker drivers

Bobby calf transporters

Livestock agents

4.5 Coordinator success factors

The Coordinator must have, or be able to quickly establish, a high level of trust with a reasonable number and range of rural service providers. The Coordinator will need to have sound experience with the main livestock species in the region and also have a network of other veterinarians who the Coordinator can confer with on the less common species.

If the program is to remain cost-effective, the Coordinator must be able to establish an arrangement with rural service providers whereby the rural service provider is happy to accept veterinary advice as full payment for the intelligence that is provided back to the Coordinator each month.

The Coordinator will need to have a high level of awareness of the clinical signs of EADs that could potentially infect livestock species in the region and have a working relationship with regional regulatory veterinarians and the nearest government veterinary laboratory.

The Coordinator should also have a good mentoring style and be able to provide sound support for less experienced veterinarians in veterinary practices in the region.

A semi-retired production animal veterinarian will probably be ideal, especially if working relationships with rural service providers already exist.

4.6 Potential distributers of the report

The Red Meat Updates Facebook page distributed the report with a ‘condition of the month’ featured at the top and may be prepared to continue.

TFGA may be prepared to distribute a brief newsletter version of the report to its members and subscribers.

SheepConnect Tasmania may be prepared to distribute a brief newsletter version of the report to about 650 sheep producers.

It is possible that rural newspapers such as “Tasmanian Country” may publish short reports and a link to the web site but would have to be approached with a product ready to print.

NRM South could distribute a newsletter style report and website link to over 700 smallholders in Southern Tasmania.

Producer groups, for example the East Coast and Coal Valley groups, may be prepared to distribute a newsletter version of the report.

4.7 Sustainable funding of passive surveillance systems

A number of funding options were considered during the course of this project. These included:

Enterprise: sale of event tickets to workshops, fund-raising events, sale of goods, services, training, advice, reports, data or product. Sale of subscriptions to receive the monthly Livestock Health Monitoring report.

Partnerships: administering resource sharing groups (eg handlers etc), sharing staff, expertise, funds, venues, expenses. Co-investment and joint funding applications. Part-funding by a number of organisations involved in rural industries.

Discounts: reductions in rates, insurance premiums, bank charges. Discounts at abattoirs, saleyards.

Donors: sponsorship, crowd-funding, donations, volunteers, internships, scholarships and pro-bono servicing.

Advertising: Veterinary pharmaceutical companies may sponsor the project if allowed to promote the company or products on reports.

Participants at the rural service provider workshops felt that many of these options were not feasible. Consideration was given to veterinary pharmaceutical company sponsorship, but all the potential distributers of the Livestock Health Report contacted so far would not allow commercial advertising to accompany the report.

5. Conclusions

The effectiveness of EAD preparedness and response arrangements will be greatly reduced by late detection of an EAD incursion. Cost-effective early detection programs have the potential to greatly reduce the potential for wide dispersion, increased costs and the risk of failure to eradicate incursions of EADs.

Any additional passive surveillance system should complement existing passive surveillance systems such as Stock Officer presence at saleyards, pre- and post-mortem abattoir inspection and rural veterinarians.

Passive surveillance systems based on confidential/anonymous reporting of diseases and conditions by rural service providers to a trusted experienced and EAD-aware non-regulatory veterinarian who then reports on the regulatory veterinarians appears to be a successful passive surveillance model.

Passive surveillance on smallholder farms remains a challenge so may need to focus on the highest risk category amongst smallholdings (possibly small rural towns and areas where smallholders border larger commercial farming areas). A high quality well-maintained livestock health and

husbandry web site with inobtrusive promotion of preventative programs such as RAM and swill feeding and reference to the EAD hotline would be valuable. Enhanced support and EAD awareness training could be provided for veterinarians servicing smallholders.

6. Recommendations

(a) Further expand and develop the rural service provider model of surveillance for EADs in regions where passive surveillance via other methods appears to be deficient, including mentoring/support for veterinarians that are prepared to do production animal work but work in practices that do not have experienced production animal veterinarians.
(b) Develop and maintain a high quality basic livestock health and husbandry web site for smallholders with links to reliable information incorporating EAD prevention (swill and RAM feeding) and EAD reporting messages. Ensure that the web site will appear high on the list after appropriate internet searches are conducted and promote vigorously to the smallholder sector.
(c) Attempt to establish Small Farms Networks in high risk smallholder areas such as small rural towns and adjacent to larger commercial farms, possibly starting by offering Healthy Livestock workshops.
(d) Strengthen the current passive surveillance mechanisms within Tasmania by:
    - improving EAD recognition and response training of Biosecurity Tasmania staff attending livestock sales
    - training abattoir and slaughterhouse staff in EAD recognition and reporting
    - provide alternative EAD training and awareness for veterinarians who cannot attend training weekends, especially those providing services in smallholder areas.

7 References

Morris, RS and Jackson R (2005) Epidemiology of H5N1 Avian Influenza in Asia and Implications for Regional Control. A contracted report for the Food and Agriculture Organization of the United Nations**.** Covering the period January 2003 to February 11, 2005

Morris, S (2012) “Engaging rural lifestyle landholders”. Report prepared for NRM North.

NSW Government (2019) Building Biosecurity for small farms. A small farms network guide.

8 Appendices

Appendix 1: Number of months each condition was reported from August 2018 to July 2019.

Disease/condition	Species	Condition count
Corynebacterium skin scabs in alpacas	alpaca	1
Flystrike in Alpaca	alpaca	1
Pneumonia in Alpaca	alpaca	1
Nasal dermatitis	alpaca	1
Vaccination site abscess	alpaca	1
Grass seed in eye	alpaca	1
Coccidiosis in a cria	alpaca	1
Wasting	alpaca	1
Abscess	cattle	1
Abscess under jaw	cattle	1
Arthritis in aged cow	cattle	1
Ataxia and loss of condition in recently calved cow	cattle	1
Black pizzle in bullocks	cattle	1
Bovine virus diarrhoea (BVD) in steer	cattle	1
Caecal impaction in steer	cattle	1
Calf deaths	cattle	1
Campylobacter (“Vibrio”) infertility	cattle	1
Cancer eye	cattle	3
Contracted tendons in calves	cattle	1
Cooperia worms	cattle	3
Cryptosporidia in dairy calves	cattle	1
Diarrhoea in cow post-calving	cattle	1
Difficult calving in heifer herd	cattle	1
Downer cows	cattle	2
Eye damage	cattle	1
Facial mass	cattle	1
Foot injury/infection in calf	cattle	1
Grass seeds in eyes	cattle	1
Ill-thrift in weaners	cattle	1
Incomplete castration by rubber rings	cattle	1
Lameness, post transport	cattle	1
Late abortion	cattle	1
Liver fluke.	cattle	5
Macrocyclic lactone resistance in Cooperia worms in young cattle	cattle	1
Malignant Catarrhal Fever (MCF)	cattle	1
Malnutrition	cattle	2
Mastitis	cattle	4
Nitrate poisoning in cattle on brassicas	cattle	1
Ostertagia (brown stomach worm)	cattle	1

Photosensitization	cattle	4
Pink-eye	cattle	6
Pneumonia/travel sickness in cattle imported from mainland.	cattle	5
Ringworm	cattle	1
Scouring in 6 week old calves	cattle	1
Split hooves	cattle	1
Stillbirths, every year in a cow	cattle	1
Swollen flank/pizzle in young bull	cattle	1
Virus (suspected) infection in steers	cattle	1
Wire injury to leg	cattle	1
Woody Tongue (Actino)	cattle	4
Photosensitisation	deer	1
Anaemia in adult goat	goat	1
Ascites (swollen abdomen) and neck oedema	goat	1
Corneal ulcer in neonatal kid	goat	1
Dog attack	goat	1
Downer	goat	1
Footrot	goat	1
Injuries	goat	1
Lice	goat	1
Malnutrition	goat	1
Mastitis	goat	1
Metritis (inflammation of uterus wall)	goat	1
Retained foetal membranes	goat	1
Rhododendron poisoning	goat	1
Spinal damage	goat	1
Urolithiasis ("stones" in urinary tract)	goat	1
Wasting in adult goats	goat	1
Worms	goat	4
Arthritis	pig	3
Erysipelas	pig	1
Greasy pig disease	pig	1
Infertility	pig	1
Lice	pig	3
Pneumonia	pig	1
Ringworm	pig	1
Scouring and deaths in piglets	pig	1
Abortions	sheep	7
Abscess	sheep	2
Acidosis	sheep	6
Arthritis	sheep	9
Aural haematoma (blood clot in ear) in rams	sheep	1

Bent legs in lambs (Chondrodysplasia)	sheep	1
Black udder in ewes	sheep	4
Bladder worm	sheep	3
Blindness and deaths in weaned lambs	sheep	1
Bloat	sheep	5
Blue-green algae toxicity	sheep	1
Bottle jaw	sheep	1
Burns from bushfires	sheep	1
Cancer of ear, eye, vulva, udder	sheep	9
Chickweed (*Stellaria media*) poisoning	sheep	1
CLA (cheesy gland)	sheep	2
Cleft palate	sheep	1
Coccidiosis in weaned lambs.	sheep	2
Congenital conditions in newborn lambs (eg born with only one eye)	sheep	1
Conjunctivitis in poddy lambs	sheep	1
Contact toxicity/allergy	sheep	1
Contracted tendons in lambs.	sheep	3
Copper deficiency in lambs on Lucerne and in imported ewes	sheep	1
Copper poisoning	Sheep	3
Cough, persistent, in ewes, then their lambs.	sheep	1
Cryptorchid	sheep	1
Cud stain	Sheep	1
Dermo (Lumpy wool)	sheep	8
Dog attack	sheep	3
Downer ewe	sheep	2
Dystocia (difficult birth) and stillbirths	sheep	3
Entropion (folded in eyelids)	sheep	1
Epididymitis in ram	sheep	3
Face lice	sheep	1
Fighting deaths in rams	sheep	1
Fly strike	sheep	7
Foot abscess	sheep	12
Footrot (virulent)	sheep	12
footrot Intermediate	sheep	1
Footrot, benign - Scald	sheep	6
Goitre in neonatal lamb	sheep	1
Grass seeds	sheep	2
Hanging around water	Sheep	1
Hard udder	sheep	1
Hernias (abdominal)	sheep	1
Hind legs paralysed	sheep	1
Hindlimb incoordination	sheep	1

Hypocalcaemia (Milk fever)	sheep	3
Inflamed inter-digital gland	sheep	1
Laminitis in ewes on grain	sheep	1
Leg fracture	sheep	1
Lice (body lice)	sheep	11
Listeria	sheep	3
Liver fluke	sheep	5
Low body condition	sheep	6
Manganese deficiency in lambs on lucerne	sheep	1
Mastitis in ewes	sheep	3
Mis-mothering of newborn lambs	sheep	1
Mycoplasma ovis anaemia in lambs	sheep	1
Navel ill (infected belly button) in lambs	sheep	2
Neurological (nervous system) signs	sheep	3
Nitrate poisoning	sheep	3
Off-shears losses	Sheep	1
OJD (Ovine Johnes' Disease)	sheep	5
Organo-phosphate (OP) poisoning	sheep	1
Ovine Brucellosis	sheep	2
Ovine interdigital dermatitis (OID)	sheep	1
PEM (polioencephalomalacia)	sheep	1
Peritonitis in a stud ram	sheep	1
Photosensitisation	sheep	2
Pink-eye	sheep	8
Pizzle rot in wethers	sheep	2
Pleurisy	sheep	2
Pneumonia	sheep	5
Predation (crow)	sheep	3
Pregnancy toxaemia (twin lamb disease)	sheep	2
Prolapsed uterus (chronic)	sheep	1
Puffy knees in stud rams	sheep	1
Pulpy Kidney in lambs	sheep	1
Rectal prolapse	sheep	1
Redgut	sheep	4
Rickets	Sheep	3
Ruptured eyeball	sheep	1
Ryegrass staggers	sheep	2
Sarcosporidia ("Sarco")	sheep	4
Scabby Mouth	sheep	5
Scaley poll lesion in polled ram	sheep	1
Scours with low egg counts	sheep	2
Scrotal hernia in rams	sheep	2
Scrotal mange	sheep	3

Sebaceous cysts	sheep	1
Sheep measles	sheep	4
Shelley toe	sheep	1
Soft swelling of chest wall	sheep	1
Soft testes in ram	sheep	3
Sub-fertility	sheep	1
Sudden deaths	sheep	3
Sunburnt eyelids	sheep	1
Swelling in neck	sheep	1
Swollen ear in rams	sheep	1
Swollen muzzle	sheep	1
Swollen testicle	sheep	2
Toe abscess	sheep	5
Toxoplasmosis	Sheep	3
Twins differ greatly in size	sheep	1
Urea poisoning	sheep	1
Vaccination lesions	sheep	5
Vaginal prolapse	sheep	4
Vulval deformity in ewe lambs	sheep	2
White muscle disease in lambs	sheep	5
Wool break	sheep	2
Worms	sheep	12
Worms - Barbers Pole worm (Haemonchus)	sheep	3

Appendix 2: Smallholder workshop report

Healthy Livestock workshops: rationale, findings and recommendations

A report prepared by Tim Ackroyd, NRM South

August 2019

Contents

1 Summary

2 Introduction

3 Project aims

4 Workshop methodology

5 Results

5.1 Characteristics of participants

5.2 Benefits of the workshops

5.3 Workshop learnings

5.4 Improving information delivery to small holders

6 Summary and preliminary recommendations

Appendix 1

Appendix 2

1 Summary

NRM South, Biosecurity Tasmania and Bruce Jackson collaborated to deliver a series of low cost education events to support the 'Livestock Health Monitoring program'. These events, known as the 'Healthy Livestock' workshops were designed to improve on-farm biosecurity practices amongst small holders and two-way communication between small holders and Biosecurity Tasmania in sharing livestock disease information. Three on-farm workshops were delivered, one on pigs and two on sheep with a total of 46 participants. As part of the workshop registration and evaluation process, participants were asked to complete an anonymous online survey and a workshop feedback form which asked them a series of questions around livestock health and management.

Survey results showed that 88% of respondents identified as hobby farmers, and 12% as farmers. Respondents said they sought their livestock management information from a variety of sources, with the internet being the most common, followed by veterinary surgeons. The most common livestock issues participants experienced on their farms included parasite infections; ranging from pig lice to barbers' pole. Feedback indicated that the workshops helped improve all participants knowledge and skills in livestock management with 100% either agreeing or strongly agreeing that they'd use the information from the workshop to manage their property. 93% of respondents would like to improve their knowledge further with 82% prepared to pay for this service.

These workshops made an important contribution to the 'Livestock Health Monitoring program' by assisting in educating small holders about important national animal health programs and upskilling them in several aspects of basic animal health and husbandry that will result in improved animal welfare for livestock on small holdings. This pilot program demonstrated that a low-cost workshop training model is one of the most effective ways to engage smallholders to educate them to improve biosecurity practices and health of their livestock.

2 Introduction

The Healthy Livestock workshops formed part of the Livestock Health Monitoring program. The Livestock Health Monitoring program was a pilot project funded by the Department of Agriculture and administered through DPIPWE (Biosecurity Tasmania). The aim of the program was to prove that it is possible to obtain enough low-cost data on the health status of livestock populations to convince Australia's trading partners that Australia is free of certain trade-sensitive diseases. Bruce Jackson veterinary consultant was responsible for implementation of the project in Tasmania.

A Livestock Health Monitoring program workshop was held last August for participants in the Livestock Health Monitoring project where it was recognised that a different approach was required to gather livestock health data from smallholders as they may not use veterinarians, rural merchandisers, consultants or sheep contractors as much as larger scale commercial producers. Other workers in this sector report that there are some special features in regard to collecting data from smallholders (Morris, 2012):

- Rural lifestyle landholders are unlikely to participate in a survey process unless they have a relationship with the organisation in question;
- There are strong social networks in some communities, and this is how rural lifestyle landholders are exchanging information about land management; and
- Face-to-face interaction results in much higher quality of data for understanding the needs and NRM engagement preferences of rural lifestyle landholders.

The Healthy Livestock workshops are effective as they fulfil a small holder sector's need for basic animal health and husbandry knowledge which can then be used as an entry point for accessing useful livestock health data and educating them about biosecurity practices. Project partners believed that cost-neutral workshops on basic animal health and husbandry would provide an opportunity where significant volumes of livestock health data can be gathered.

3 Project aims

This project aimed to demonstrate that a cost-neutral basic animal health and husbandry workshop program could:

- Obtain valuable animal health surveillance data from smallholders.
- Educate smallholders about important national animal health programs such as preventing Restricted Animal Material (RAM), swill and offal feeding and how to report suspected Emergency Animal Disease (EAD) events.
- Educate smallholders on aspects of basic animal health and husbandry that will result in improved animal welfare for livestock on small holdings.

The Livestock Health Monitoring pilot program in partnership with NRM South decided to trial a series of three cost-neutral 'hands on' basic livestock health and husbandry workshops in two different areas to trial the concept. The common livestock species kept in this sector are sheep, cattle, goats, pigs and poultry and hence training in at least two of these species was offered.

4 Workshop methodology

The three one-day Healthy Livestock workshops were delivered in May and June 2019. Each workshop covered the following four key themes:

1. Identifying common livestock diseases and illnesses;
2. Disease and illness prevention and management (including farm biosecurity planning);
3. Body condition scoring;
4. Undertaking basic procedures that will support disease prevention, such as foot trimming in sheep, worming, vaccination and associated animal handling techniques

Animal ethics approval was obtained through DPIPWE's Animal Ethics Committee to allow participants under supervision, to undertake basic procedures on sheep and pigs, including handling and restraint, vaccination, drenching, foot trimming and body condition scoring.

All three workshops were hosted on farms and were promoted through established NRM South networks, local councils, social and print media. Participants were required to pay a $30 fee on Eventbrite to attend each workshop and were encouraged to complete an anonymous online survey on Survey Monkey to answer a series of questions. The survey was designed to help tailor the workshops to participant's needs and contribute valuable data to the Livestock Health Monitoring program. Key online survey questions included:

1. **Which of the following animals are present on your property?** (please select all that apply) Cattle/Sheep/Pigs/Horses/Alpacas/Goats/ Chickens/ducks/geese Other
2. **What sorts of animal health problems (including parasites) have been on your farm or nearby over the last 3 months?**

3. **Where do you get information from when you have an animal health/parasite problem?** (please select all that apply from the following list) Shearer/Book/ Rural merchandiser/Consultant/ Neighbour/Local expert/Internet/Veterinary surgeon/ Department of Primary Industries Parks and Environment (DPIPWE)/Other
4. **Have you previously consulted a veterinary surgeon regarding livestock disease / illness?**
5. **Are there any specific questions you'd like answered at the 'Healthy Livestock' workshop relating to animal health?** Please specify

Each event was supported by expert presenters, including veterinary surgeons, livestock specialists, farmers and grazing specialists, who assisted participants through both theory and practical sessions. All participants were given the opportunity to share their experience and ask questions through structured Q&A sessions. Participants were asked to complete a comprehensive feedback form after completing the workshops, questions included:

1. **Gauging participants understanding of the subjects covered prior to and after attending the workshops**
2. **Likelihood of them adopting these practices on their own properties**
3. **How they rated the workshop and what they found most valuable**
4. **How the workshop could be improved or what further information did they require**
5. **Would they like to continue to improve their knowledge and understanding and how they'd like to do this?**
6. **Would they be prepared to pay for any services that helped them improve their skills and understanding**
7. **Would they be happy for the workshop coordinators to contact them later in the year to see if what you've learnt today has been useful and applicable to you?**

Please see Appendix 1 and 2 for the complete online survey and workshop feedback questionnaire.

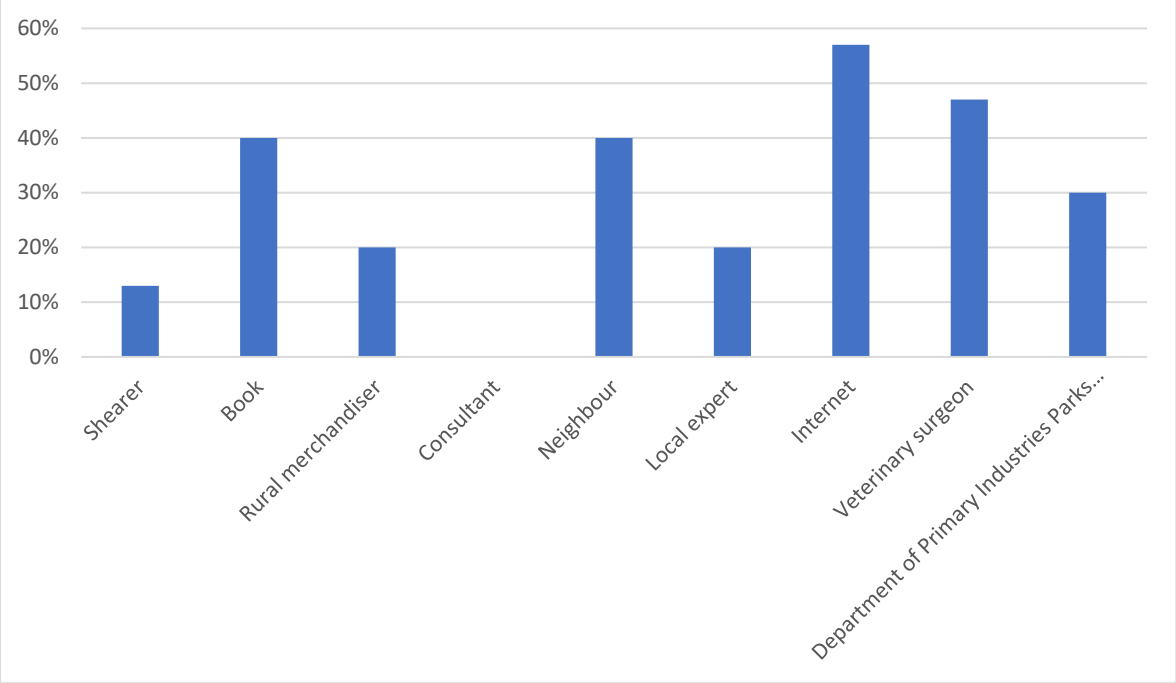
5 Results

5.1 Characteristics of respondents

Of the 46 workshop participants, 30 completed the anonymous online survey and 45 completed the workshop feedback forms. 88% of the 45 participants who completed the feedback forms, described themselves as hobby farmers, and 12% as farmers. Of the 3 workshops, 16 individuals attended the 'Healthy Sheep' workshop in the Huon Valley, 14 attended the 'Healthy Pig' workshop in the Huon Valley and 16 attended the 'Healthy Sheep' workshop in the Tasman.

The online survey results showed that participants sought information about livestock management from a number of sources (see Figure 1).

Figure 1: *survey results indicating where participants typically got their information from on livestock management*

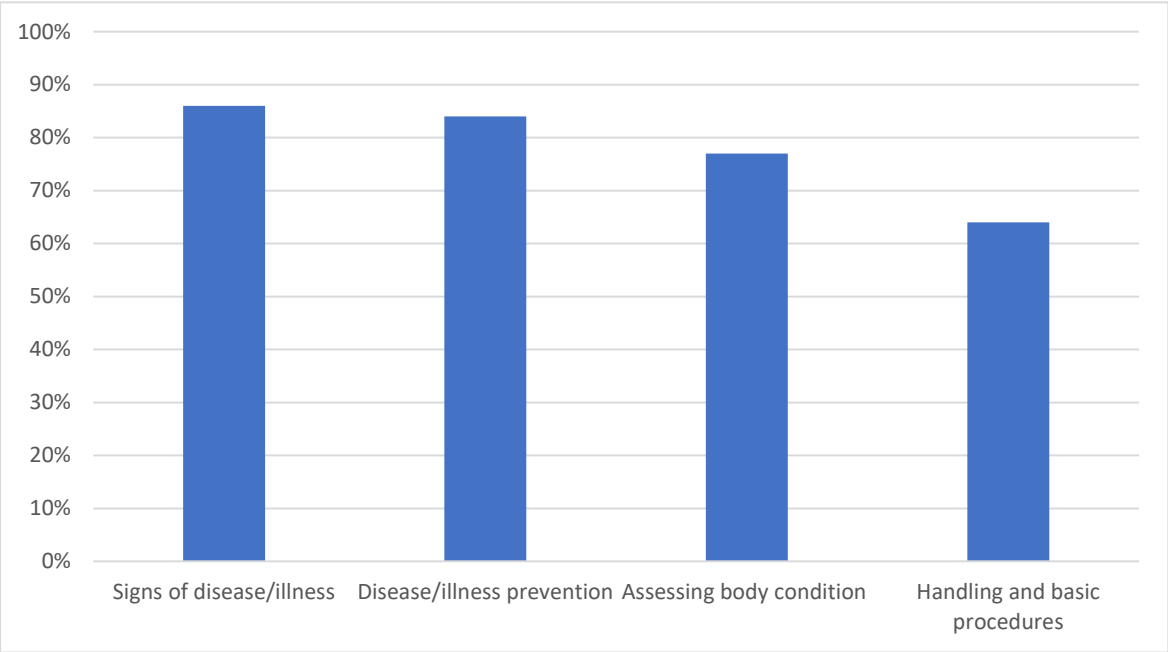


27% of respondents reported that they had experienced minor animal health problems amongst their livestock in the last 3 months, though the majority were parasite related issues, with one case of barber's pole. 47% of respondents said they had previously consulted a veterinary surgeon regarding livestock disease and illness.

5.2 Benefits of the workshops

Feedback indicated that the workshops helped improved all participants knowledge and skills in livestock management (health and husbandry), in the four key subject areas from very poor, poor and average to good or very good, these included: Identifying signs of disease and illness; Disease / illness prevention; Assessing body condition; Handling and basic procedures. The lowest level of improved of knowledge and skills was seen in 'Handling and basic procedures' (64%) and is likely to reflect the fact that participants were less able to participate in this topic in the 'Healthy Pig workshop' for health and safety reasons and this lowered the average percentage score across all three workshops (See figure 2). When considering the data for the sheep workshops only, 78% of participants improved their knowledge and skills in 'Handling and basic procedures' and participants of these workshops indicated that the practical handling session were the most valuable of the topics covered.

Figure 2: *survey results indicating the percentage of participants that improved their knowledge and understanding of workshop topic from very poor, poor and average to good or very good*



Practice change

All participants indicated they would directly use the information they learned at the workshops to manage their property, from a scale of 1-5, (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) 40% 'agreed' and 60% 'strongly agreed' that they were likely to use the information they've learnt from the workshops to improve animal health and husbandry.

Workshop rating

From a scale of 1-5 (1 = very poor, 2 = poor, 3 = average, 4 = good, 5 = very good) 18% of participants rated the workshops as 'good' and the remainder 82% as' very good'. Written and verbal feedback from participants was very positive, the following are some examples from participants' responses to question 5 'What did you find most valuable about today's workshop':

> *"The range of coverage of the subject. Very well-informed presenters. Clear and informative presentations. Practical hands on demonstrations"*
>
> *"High quality info and discussion"*
>
> *"All of it was extremely valuable"*

Further information sought by participants

Participants were asked if there was anything from the workshops, they'd like further information on, key responses included:

- Research information on diseases and their control
- Pastures, pasture composition and improvements – building on the pasture sessions covered
- Farm and livestock contractor contacts
- Slaughtering, butchering comments and contacts
- More on supplementary feeding and choices for different livestock
- Networking

- Fencing for pigs

Follow up emails were sent to participants after the workshops to provide them with further information addressing their comments in the feedback forms.

5.3 Workshop learnings

Participants were also asked if there was anything that could be improved in the content, structure or delivery of the workshops, suggestions included:

> *"More information on feeding, housing, farrowing and fencing for pigs"*
>
> *"It was great, but we covered a lot in the workshop, all very useful, just lots to take in"*

The format of the Healthy Pig workshop could have been adapted to reflect the fact that practical handling in pigs can be difficult to undertake in a workshop setting. More time could have been allocated to discussing nutrition, housing and infrastructure for pigs.

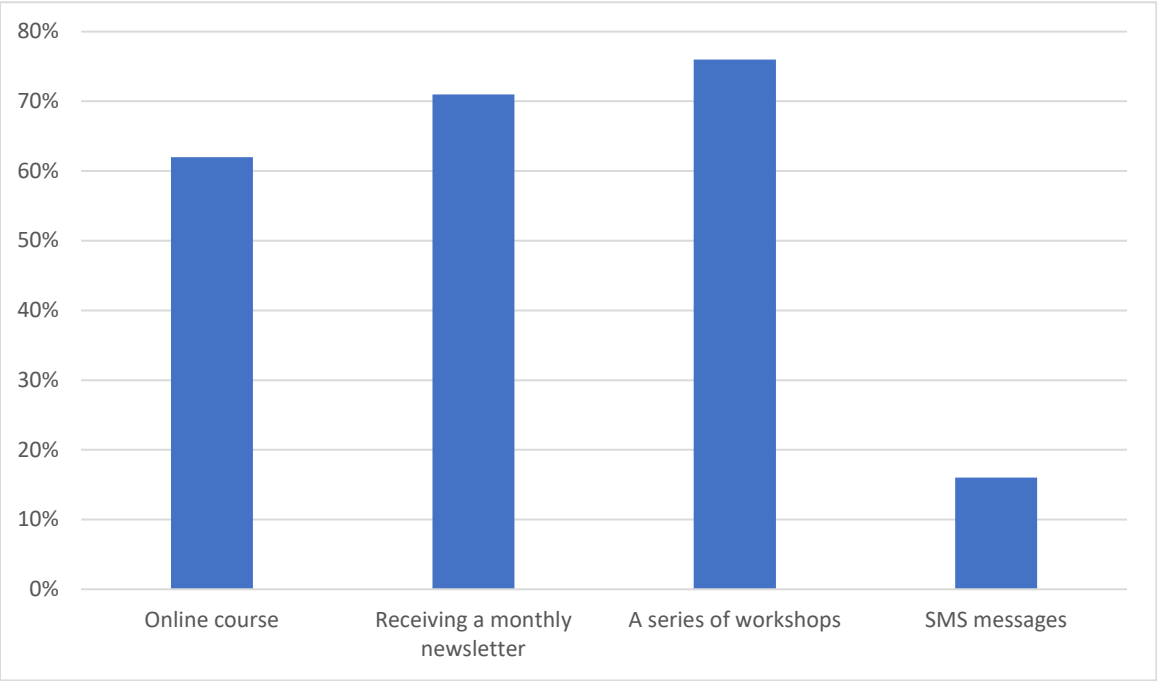
Due to the variation in small holders level of understanding in livestock management, it can be challenging to meet the needs of all participants in these kinds of workshops, although overwhelming feedback from participants indicated that these events met their needs and largely delivered the aims of the project brief.

To further tailor the workshops to participants needs, additional questions could be incorporated into the online survey that gauge participants' level of experience in managing livestock, questions may include, 'How long have you owned land and kept livestock?', 'Have you attended similar courses previously and what did you learn from them?', 'What is your level of understanding in the following subjects?', this last question could be taken from the workshop feedback form which is currently only presented to participants at the end of a workshop.

5.4 Improving information delivery to small holders

93% of respondents indicated they would like to further improve their knowledge, with 82% prepared to pay for this service. Participants were given an opportunity to comment on their preference for how they'd like to improve their knowledge on the topics discussed (see figure 3).

Figure 3: *survey results on how participants would like to improve their knowledge of livestock health and husbandry*



Finally, participants were asked if they'd be happy for the workshop coordinators to contact them later in the year to see if what they'd learnt has been useful and applicable. Of the 43 participants that responded to this question, 84% said they'd be happy to be contacted. NRM South will contact these participants six months after the workshops with an email, followed up by a phone call, this will also provide an opportunity for workshop facilitators to help address any new questions participants may have around livestock health and husbandry.

6 Summary and preliminary recommendations

The results of the 'Healthy Livestock workshops' online survey and feedback forms show that the 'Healthy Livestock' workshops made an important contribution to the 'Livestock Health Monitoring program' and largely met their intended aims by assisted in educating small holders about important national animal health programs such as preventing RAM, swill and offal feeding and how to report suspected EAD events. The workshops also educated smallholders on aspects of basic animal health and husbandry that will result in improved animal welfare for livestock on smallholdings.

What is less clear is whether valuable data on animal health surveillance was obtained. Some valuable information was obtained on where small holders' get their information from and how they'd like to improve their knowledge, skills and understanding in livestock management. This information will help guide future work around improving farm biosecurity awareness and practices amongst small holders.

The pilot program demonstrated that this low-cost workshop training model is one of the most effective ways to engage small holders in improving their biosecurity practices. Improvements could be made to make future workshops more effective at obtaining livestock disease information, such as by encouraging participants to receive and contribute to a regular disease status update newsletter. Comprehensive and up to date animal health surveillance is paramount to an effective biosecurity strategy, however, smallholders may be reluctant to report health issues in their

livestock for fear of repercussions. Further work is needed to explore how to encourage and engage small landholders to report disease and health issues in their livestock.

Appendix 1: NRM South 'Healthy Livestock' workshops online survey

This survey should be complete prior to attending one of the NRM South 'Healthy Livestock' workshops

The information provided in this survey will be used to help tailor content for the individual 'Healthy Livestock' workshops and will be kept confidential.

For more information on individual workshops please contact:

Tim Ackroyd, NRM South Program Officer Agricultural on 0400 047 665 or via email on tackroyd@nrmsouth.org.au.

1. **Please indicate which of the following workshops you will be attending:**

- ○ Healthy Livestock workshop Sheep (Huon Valley) - Saturday May 25
- ○ Healthy Livestock workshop Pigs (Huon Valley) - Saturday June 1
- ○ Healthy Livestock workshop Sheep (Tasman) - Sunday June 2

2. **Which of the following animals are present on your property? (please select all that apply)**

- ☐ Cattle
- ☐ Sheep
- ☐ Pigs
- ☐ Horses
- ☐ Alpacas
- ☐ Goats
- ☐ Chickens/ducks/geese
- ☐ Other (please specify)

3. **What sorts of animal health problems (including parasites) have been on your farm or nearby over the last 3 months?**

Question Title

4. **Where do you get information from when you have an animal health/parasite problem? (please select all that apply from the following list)**

- ☐ Shearer
- ☐ Book
- ☐ Rural merchandiser
- ☐ Consultant
- ☐ Neighbour
- ☐ Local expert
- ☐ Internet
- ☐ Veterinary surgeon
- ☐ Department of Primary Industries Parks and Environment (DPIPWE)
- ☐ Other (please specify)

5. **Have you previously consulted a veterinary surgeon regarding livestock disease / illness?**

- ○ Yes
- ○ No

6. **Are there any specific questions you'd like answered at the 'Healthy Livestock' workshop relating to animal health?**
Please specify

Appendix 2: Feedback form – Healthy Livestock workshop

Some info about you:

I have attended trainings/events by NRM South before	Y / N
Type of property (circle if applicable)	Hobby farmer / Farmer / other (please specify):
Where is your property (Suburb/Postcode)	

Please circle your response to the following questions/statements.

1. My knowledge and understanding of this topic PRIOR to the workshop was:					
	Very Poor	Poor	Average	Good	Very Good
Signs of disease/illness	1	2	3	4	5
Disease/illness prevention	1	2	3	4	5
Assessing body condition	1	2	3	4	5
Handling and basic procedures	1	2	3	4	5

2. The workshop IMPROVED my knowledge and understanding of this topic:					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Signs of disease/illness	1	2	3	4	5
Disease/illness prevention	1	2	3	4	5
Assessing body condition	1	2	3	4	5
Handling and basic procedures	1	2	3	4	5

3. I will directly use the information from today's workshop to manage my property:					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5

4. Overall how would you rate the workshop:				
Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

5. **What did you find most valuable about today's workshop?**
6. **Is there anything from today's workshop you would like further information on?**
7. **Is there anything that could be improved in the content, structure or delivery of today's workshop?**
8. **Would you be interested in further improving your knowledge of livestock health and husbandry?**

   Yes ☐ No ☐
9. **If you answered 'Yes' to question 8, how would like to improve your knowledge? (please tick all boxes that apply from the following list):**

   ☐ a) Online courses

   ☐ b) Receiving a monthly email newsletter which lists diseases that have occurred in the last month in southern Tasmania and notes on recognising signs and treatment

   ☐ c) A series of workshops

   ☐ d) SMS messages

   ☐ f) Other (please specify):
10. **If interested in a, b or c (above), would you be prepared to pay for these services?**

    Yes ☐ No ☐
11. **Would you be happy for the workshop coordinators to contact you later in the year to see if what you've learnt today has been useful and applicable to you? (this is also an opportunity for us to help address any new questions you may have)**

    Yes ☐ No ☐

Contact Details (optional*)

To be added to NRM South's mailing list and/or contacted by the Event Organiser about your responses on this form and/or future events.

NAME:	
EMAIL:	
PHONE:	

Thank you for taking the time to complete this Feedback Form
The information provided will be used to improve our future project/program activities.