



# Ovine Footrot Management Program Review

South Australia

Final Report  
March 2024

Ron Glanville, Biosecurity Advisory Service

Michelle Hall and Peter MacIntyre, Sapere Research Group

CIS	Chief Inspector of Stock
CVO	Chief Veterinary Officer
EAD	Emergency animal disease
MCA	Multi-criteria analysis
NSHD	National Sheep Health Declaration
PCR	Polymerase Chain Reaction
PDMP	Property Disease Management Program
PESTLEOSS framework	Political, Economic, Social, Ethical, Technical, Legal, Environmental, Operational, Safety and Stakeholder engagement framework
PIRSA	Department of Primary Industries and Regions South Australia
ROI	Return on investment
R&D	Research and development
SA	South Australia
SIF	Sheep Industry Fund

*The conclusions and recommendations within are those of the authors and do not represent the views or policy of Livestock South Australia or the South Australian government.*

# Contents

Executive Summary.....	5
List of Recommendations.....	7
1. Introduction .....	8
2. Background .....	8
2.1 History and current situation .....	9
2.2 Control / eradication methodology .....	14
3. Project Requirements .....	16
4. Methodology.....	17
4.1 Consultation .....	17
4.2 Application of Animal Health Decision Making Framework .....	18
5. Issues arising from consultation .....	18
5.1 Individual interviews .....	18
5.1.1 Footrot Detection and Surveillance .....	18
5.1.2 Prevention .....	20
5.1.3 Industry Attitudes .....	21
5.1.4 Support for footrot affected producers .....	22
5.1.5 Costs.....	23
5.2 Industry survey.....	25
5.3 Summary of key issues.....	29
5.4 Possible program enhancements.....	31
5.4.1 Level of investment.....	31
5.4.2 Overall program design.....	31
5.4.3 Program management .....	32
5.4.4 Regulation or deregulation .....	32
5.4.5 Education, awareness and support.....	33
5.4.6 Improving surveillance .....	34
5.4.7 Certification & prevention .....	35
5.4.8 Subsidies / Incentives.....	36
5.4.9 Regional / National Approaches .....	36
5.4.10 Diagnostics .....	37
5.4.11 Vaccination.....	37

5.4.12	Genetics .....	37
6.	Analysis using Animal Health Decision Making Framework .....	38
6.1	PESTLEOSS analysis .....	38
6.2	Who should be making this action and investment? .....	39
6.3	What sort of action might be most worthwhile? .....	39
6.3.1	Defining the problem .....	40
6.3.2	Identify the options.....	40
6.3.3	Economic assessment using multi-criteria analysis .....	45
6.3.4	Risks and implementation considerations for the preferred option .....	61
6.4	Communication of decision for transparency.....	62
7.	Conclusions and Recommendations .....	63
	Appendix A: Stakeholder categories and regional locations of people consulted individually.	
	69	
	Appendix B: Animal Health Decision Making Framework .....	70

## Executive Summary

Ovine footrot is a complex disease of sheep that can lead to severe foot lesions, lameness, production loss and adverse animal welfare outcomes. There are benign and virulent forms of the disease, with varying disease severity which is also influenced by sheep breed and climatic conditions. The nationally reported prevalence of footrot in South Australia is three percent of flocks infected with virulent footrot and 30 percent infected with the benign form, with most occurring in the high rainfall areas of the southeast, Kangaroo Island, Adelaide Hills and the Fleurieu Peninsula. However, the actual prevalence is unknown but probably substantially higher.

Footrot has been subject to official controls for many decades, with the current program now fully funded by the South Australian sheep industry. The program was substantially upgraded in 2019, including the adoption of laboratory-based diagnosis. Detection rates have increased since this time. The current annual industry investment is approximately \$909,000. Footrot is notifiable under the *Livestock Act 1997* and infected flocks are subject to strict movement restrictions until the disease is eradicated through either destocking or a treatment program.

This review was commissioned following recent concerns raised within the industry regarding the program's effectiveness and adverse impacts on many individual sheep producers. The latter includes market distortions caused by the disease being largely deregulated in Victoria, as well as the high costs associated movement restrictions and eradication following diagnosis of virulent footrot on a sheep property. The review required consultation with a wide range of relevant stakeholders through individual interviews and an on-line survey. The information gained was then assimilated to generate proposals regarding how to improve footrot management in South Australia. The information generated was then further assessed through application of the *Animal Health Decision Making Framework* that was developed as a precursor to this project (see Appendix B).

Key issues arising from consultation included:

- The widely held belief that there is significant under-reporting of footrot cases owing to a fear of the repercussions (movement restrictions and cost of eradication). People also avoided southeast saleyards for the same reason. Hence, the sensitivity of detection is low and the actual prevalence of footrot is likely to be much higher than the apparent prevalence. This severely compromises the program's effectiveness.
- Despite mandatory completion of a sheep health declaration, there is a general lack of individual producer responsibility or awareness of risk in relation to introduction of potentially infected sheep onto properties.
- There is a poor understanding of the disease generally and the current program, while supported by those in lower prevalence areas, provides a false sense of security. The animal welfare impacts of footrot were also seen as an industry vulnerability in terms of public perception if not managed appropriately.
- The cost of eradication is high for most producers. It requires meticulous application of the principles and is mentally stressful. For some producers it is not a viable option.
- Better access to advice and support is required for affected producers, particularly those that do not currently report the disease and seek help.

- Overall, 55 percent of respondents to the survey did not consider the program to be achieving its aims, with a further 28 percent unsure, although during interviews most people did not have a clear view on how to improve the program. However, in general terms, there were two main ‘camps’: those that suggest that the existing program should be strengthened with stronger surveillance and regulation, together with increased funding; and those that argue for a level of deregulation, together with more support for people to take greater individual responsibility for control. In the survey and during individual consultations, the latter camp was the most vocal.

A range of individual program enhancements were suggested by those consulted, which can be considered in the design of any future program. These included: increasing the program budget; greater involvement of industry in program design and management; enhancing surveillance and regulation; deregulation, with an increased emphasis on ‘buyer beware’; improving education, awareness and support; better certification / assurance processes for those purchasing sheep; subsidies to provide incentives for producers to take action; and improving technology such as diagnostic tests, vaccines and improving the genetic resistance of sheep to footrot.

Based on the consultation, four options were developed as the basis for the design of a future program. They were:

1. The current program.
2. An enhanced regulatory program, with improved surveillance, a strengthened sheep trading declaration system and an increased budget. Other improvements listed above could also be considered.
3. Enhanced industry management of footrot program. This would include enhanced support and education for both producers and potential service providers, targeted incentives such as subsidised initial consultations with a specialist, and partial deregulation aimed at de-stigmatising footrot so that people will seek help.
4. Full deregulation.

These options were then analysed using the *Animal Health Decision Making Framework* and more specifically, a multi-criteria analysis. Part of this assessment involved being clear on the aims of a future program, which were defined as ‘*to reduce the economic and animal welfare impacts of footrot across the South Australian sheep industry, by enhancing the understanding, diagnosis, prevention and management of footrot using a collaborative industry approach*’.

Option 3 is the preferred option. We considered that the above aim can only be achieved by at least partial deregulation to increase transparency, remove fear of consequences and remove stigma. Its success depends also on effectively providing better support to producers, but this success is not guaranteed. There is a level of uncertainty in relation to what percentage of producers will take advantage of the increased level of support that should be available. How well it is implemented will be critical.

Also considered critical is that program design and management should become a true partnership between industry and government. Past experience is that animal health programs work best when key stakeholder groups are directly involved in program design and strategic management. Simple consultation is not enough.

With this in mind, a number of key areas of detailed program design are highlighted for discussion between government and industry before the design of the future program is finalised. These are: the level of funding; how to improve support to producers, including any incentives; the level of ongoing government involvement; the details of the retained regulatory provisions; and how to improve risk-based trading arrangements.

Given that Livestock SA needs to make a decision soon about funding of the program, a transition program is likely to be required. The approach suggested is to approve the existing program funding application but make adjustments to its management as much as is possible within the existing regulatory environment, so that it is consistent with the intent of the new program.

Whichever program option is chosen it is considered vital that any changes are well communicated, including time frames and that outward facing documents provide a full description of the program design and requirements. The latter is currently not the case.

Five high level recommendations are made in the report. However, a range of other lower-level suggestions are also made for consideration by program managers.

### List of Recommendations

**Recommendation 1:** A future footrot control program in South Australia should aim to *reduce the economic and animal welfare impacts of footrot across the South Australian sheep industry, by enhancing the understanding, diagnosis, prevention and management of footrot using a collaborative industry approach.*

**Recommendation 2.** A future footrot control program for South Australia should be jointly designed and managed by industry and government.

**Recommendation 3.** Option 3, *Enhanced industry management of footrot*, should be adopted as the model for future management of footrot in South Australia.

**Recommendation 4.** Livestock SA should consider approving the existing program application for funding, provided it is acknowledged that it will be managed, where possible, in line with the future intended approach.

**Recommendation 5.** Communication to industry of the design and time frames for the future footrot control program should be given a high priority and a full description of program features and requirements should be published on the PIRSA website.

## 1. Introduction

Through the Sheep Industry Fund (SIF), South Australian sheep producers can invest in endemic disease management programs that deliver regulatory disease control, undertake surveillance, and deliver disease management assistance for producers with infected animals. Funds within the SIF are derived from producers' levies.

The aim of these programs is to benefit the industry by managing diseases that impact profitability and productivity and have negative animal welfare implications.

One such program is the South Australian Footrot Management Program, which is delivered by the Department of Primary Industries and Regions (PIRSA). For the financial year 2023-24 PIRSA will receive approximately \$909,000 (excluding GST) from the SIF.

In response to various concerns raised, Livestock SA facilitated a workshop of government and industry stakeholders on 30 March 2023 to discuss the program and its future application. Key themes were identified as priorities to be considered for the future of the program, including deregulation, zoning models, economic cost/benefit analysis of the program, education and reviewing of funding models. Ultimately the workshop found that a formal review of the current program and an assessment of alternative footrot management models was required. This report presents the findings of the review.

## 2. Background

Ovine footrot is a complex sheep disease that can lead to severe foot lesions, lameness, production loss and adverse animal welfare outcomes. The bacterium primarily responsible for footrot, *Dichelobacter nodosus*, is genetically diverse and difficult to work with in the laboratory. The expression of clinical footrot is variable, with three primary factors influencing the severity of disease: bacterial genetics, sheep genetics, and environmental conditions. Two forms of the disease are commonly referred to, that is, benign and virulent, which are clinically distinguished by the severity of foot lesions seen<sup>1</sup>. However, there is both a spectrum of clinical expression of the disease and the strains of the bacterium.

People now often refer to benign, intermediate virulent and highly virulent forms of footrot, but it should be realised that classification of footrot is not black and white, given the spectrum of disease and its multifactorial nature. Interpretation of the various factors in diagnosis, including laboratory tests and clinical expression means that definitive determination of virulence is complex and will differ between veterinarians. This is challenging for producers, veterinarians and regulators but is an intrinsic feature of the disease.

In 2022, footrot (all forms) was estimated to cost the Australian sheep industry \$82.2 million per year from production losses and disease control costs<sup>2</sup>. This is an increase from the

---

<sup>1</sup> Clinically determined by the percentage of sheep suffering severe footrot lesions - typically footrot is classified as virulent where lesions of score 4 or greater are detected in more than 1% of the mob. In South Australia it also includes where the Elastase test indicates elastin breakdown of 12 days or less.

<sup>2</sup> Shephard, R., Webb Ware, J., Blomfield, B., Niethe, G. Priority list of endemic diseases for the red meat industry — 2022 update. MLA.  
[http://herdhealth.com.au/downloads/bahe0327\\_endemic\\_disease\\_economics\\_update\\_nov22.pdf](http://herdhealth.com.au/downloads/bahe0327_endemic_disease_economics_update_nov22.pdf)



2015 estimate which was \$51 million (in 2022 dollars). These estimates are possibly an under-estimate as they are based on official prevalence estimates (discussed later). The severity of disease and losses in an individual flock can vary with the strain of the bacteria, sheep breed and control measures practiced. Within flock prevalence can range from very low < 5% of sheep in drought years to more than 80% in wet years with extended growing seasons. A more detailed description of the disease and clinical signs can be found on the PIRSA website<sup>3</sup>, as well as the Coopers® Animal Health and Sheep Connect documents listed in section 2.2.

## 2.1 History and current situation

Footrot has been a disease of sheep in Australia for many years, with the disease first mentioned in South Australia in 1875. An official, regulatory based control program has been in place for over 70 years, as was originally the case in most Australian states. In South Australia, the program has been partially industry funded from the early 2000's and fully funded by industry since 2012. Each jurisdiction now manages footrot differently:

- In Victoria footrot is largely unregulated, although the disease remains notifiable so that action can be taken if warranted (very rare). Deregulation occurred following withdrawal of industry funding in the early 2000's. There is no formal saleyard surveillance and use of the footrot vaccine does not require CVO approval as in South Australia.
- Western Australia has a regulated control program similar in nature to the current South Australia program. However, a key difference is that WA conducts intensive surveillance for footrot at their two main abattoirs during the footrot spread period.
- NSW has also had a regulated control program since 1988. However, it is currently being redesigned to move more towards a focus on education, producer empowerment and disease control (not just eradication).
- Tasmania fully deregulated footrot control nearly 50 years ago.
- In Queensland, although notifiable, footrot has never had a significant impact, hence there is no official control program.

In South Australia, footrot remains a notifiable disease and movement restrictions on properties infected or suspected to be infected with virulent footrot apply under the *Livestock Act 1997*. These restrictions limit the ability for sheep to be sold to other producers or at a public market, and they must not be allowed to stray onto neighbouring properties or public roads.

The current, industry funded program aims to reduce animal welfare issues, the economic impacts of the spread of footrot and to assist producers to manage the disease. The program was last reviewed in 2012 by ID Johnson and KH Walker, focussing on the 3-year period 2009-2011. The review reported relatively large increases in detection rates, but because of major external drivers, it could not be determined if this was due to a change in prevalence or the effectiveness of the program. The program appeared to provide a significant and important/valued deterrent to producers selling footrot infected sheep in public saleyards, but its impact on controlling or reducing flock prevalence could not be measured. The stakeholders contacted during the review, although only a small sample,

---

<sup>3</sup> [https://pir.sa.gov.au/biosecurity/animal\\_health/animal\\_species/sheep/health/footrot#toc\\_What-is-footrot](https://pir.sa.gov.au/biosecurity/animal_health/animal_species/sheep/health/footrot#toc_What-is-footrot)

were generally very supportive of the program and the PIRSA staff involved, and all agreed that the program should continue in some form.

A number of mostly modest recommendations were made to improve the program, including ways to better quantify actual flock prevalence and to increase on-property detection rates. However, recommendation 1 stated “PIRSA and SASAG consider a change in program objective to the “progressive eradication” target successfully pursued by NSW DPI, and develop more appropriate KPIs”. The report was not clear on what is meant by progressive eradication, but it is noted that in 2019 South Australia moved to laboratory based diagnosis which was aimed at addressing the spread of virulent footrot caused by unregulated movement of sheep from "clinically benign" flocks.

Some of the stakeholder feedback in the 2012 review was similar to that documented in this 2024 report, but the conclusions are different and in some ways, contradictory, viz:

- *The majority of producers contacted fear a footrot outbreak in their flock and the associated social stigma and costs attached to it, and support a continuation of the program, as do saleyard agents.*
- *Despite being a notifiable disease, the presence of virulent footrot is likely to be significantly under-reported, partly because of the difficulties with positive diagnosis, and partly because of fear of quarantine imposition.*
- *If the control objective continues, virulent footrot prevalence is unlikely to be reduced unless program activities shift to increase detection rates, enhance eradication (using better technology management) and emphasise prevention (through greater adoption of appropriate biosecurity management practices when high risk sheep are introduced into flocks).*
- *There is no indication that maintaining the footrot control program in its current form will result in any improvement in flock prevalence, other than might occur with a return to drier seasons.*
- *The producers and agents spoken to strongly supported continuation of the footrot control program and were generally in favour of the recommendations made.*

The reviewers also posed (but did not answer) the question, “What level of control is the target for the project?”

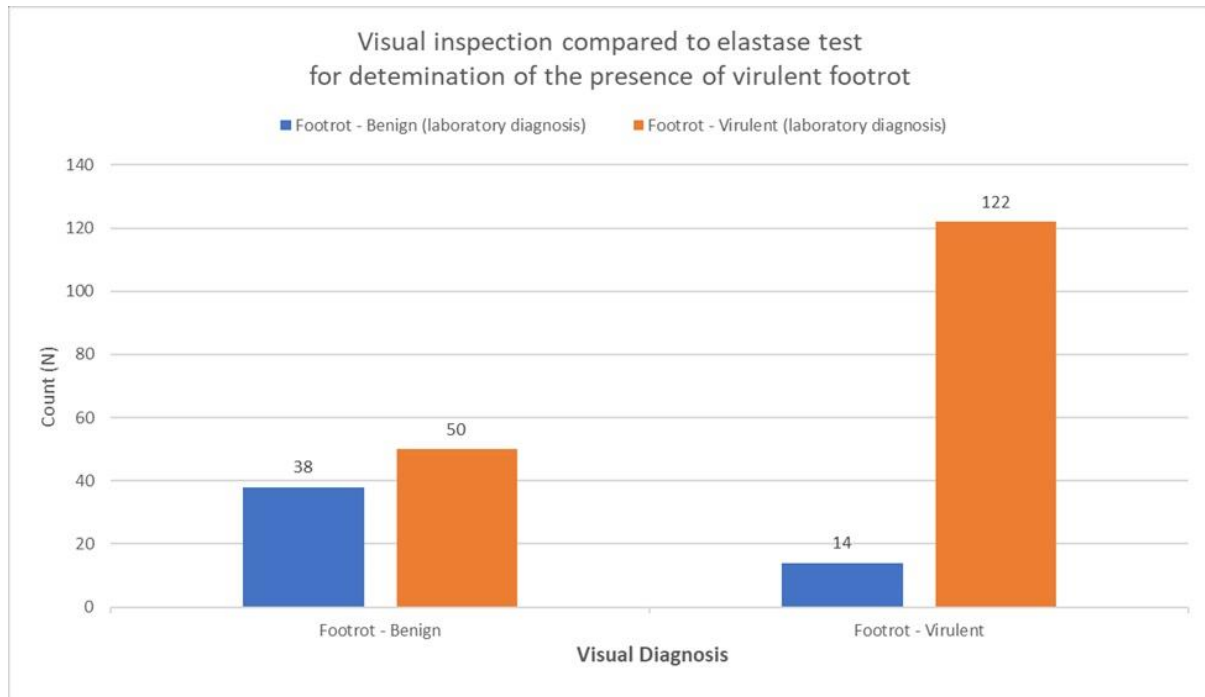
As noted above, in 2019, the program moved to using laboratory tests (elastase test<sup>4</sup>) to assess the virulence of the footrot bacterium present, rather than just clinical disease expression. Clinical differentiation of virulent and benign footrot is relatively straightforward when the disease is fully expressed. However, it can be difficult during the initial stages of infection or where environmental conditions do not enable the full expression of the disease, hence use of this test. The complexity of footrot diagnosis is demonstrated by figure 1 below, which indicates that many clinically benign cases of footrot are caused by

---

<sup>4</sup> The elastase test is conducted by inoculating a pure culture of *D. nodosus* onto an agar culture medium which contains large particles of elastin, which is a protein. If the bacteria produce an active form of the proteolytic enzyme called elastase, it diffuses into the agar and gradually digests the elastin particles, resulting in a clear zone. Strains of *D. nodosus* that cause virulent footrot tend to have greater elastase activity than strains associated with benign footrot. In general terms, the time taken for digestion of elastin is inversely proportion to the virulence of the isolate of *D. nodosus*.

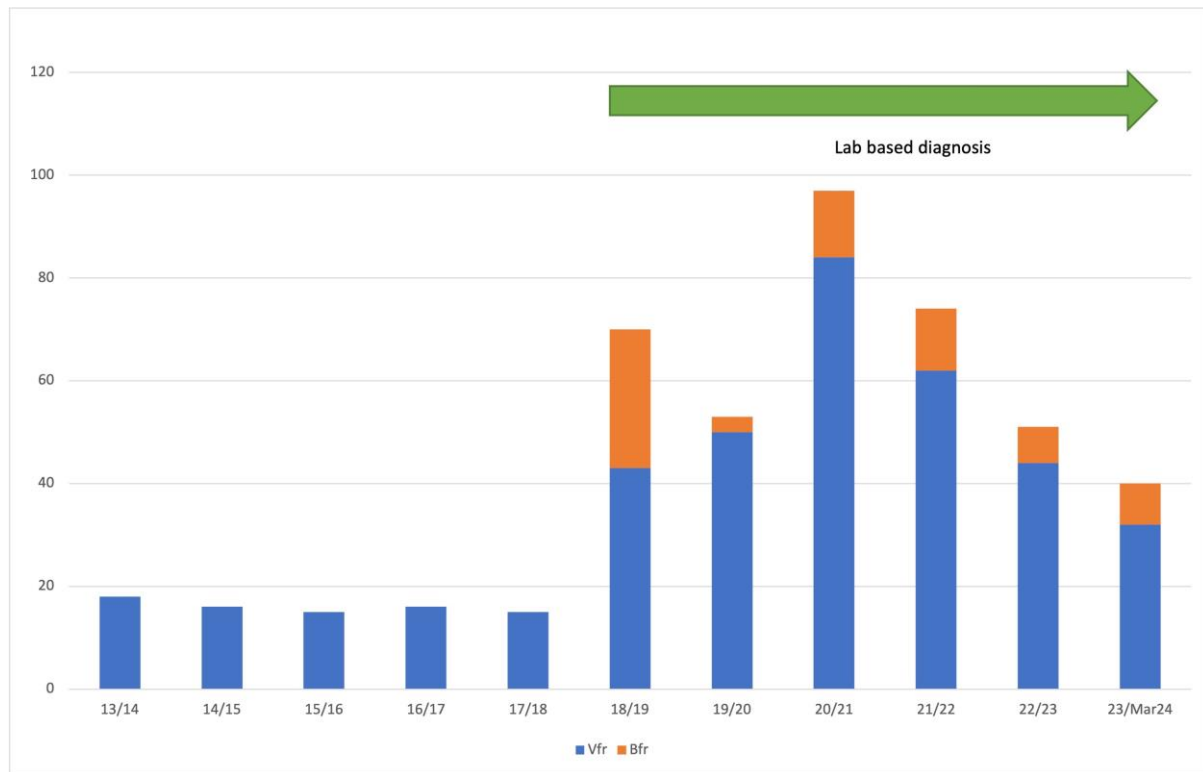
virulent strains and a much smaller percentage of clinically virulent cases can be caused by benign strains.

Figure 1: Comparison of clinical versus laboratory diagnosis of footrot (South Australian cases Sept 2019 to June 2023).



The South Australian footrot control program was significantly upgraded in 2019 and program management generally has also become more robust since that time, resulting in significantly improved detection rates. Figure 2 below shows the increased rate of detection of footrot since 2019, which has been attributed to a number of factors, including; use of laboratory based diagnosis, all forms of footrot being recorded against detection statistics, and a more uniform application of program requirements across the entire state.

Figure 2: Footrot detection in South Australia for the last 12 years.



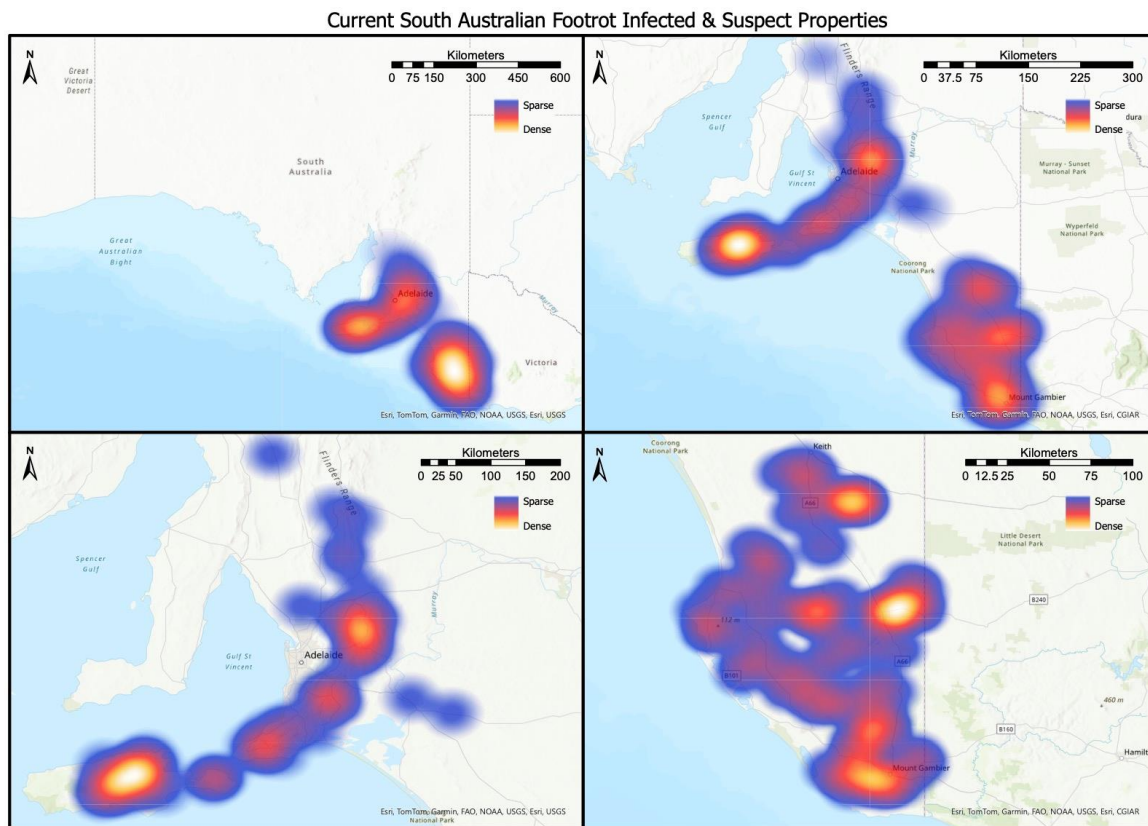
The different management approaches between South Australia and Victoria has created market distortions and resulted in concerns being raised by southeast (bordering Victoria) saleyards, livestock agents and producers. These concerns include reports of increasing numbers of South Australian sheep being sold at interstate saleyards to avoid the stigma associated with possible footrot detections from the current program at local saleyards. However, it is understood that there are also other commercial reasons for people marketing their sheep at larger, Victorian saleyards.

The distribution of footrot detections is very much climate dependent (see figure 3 below), with the highest prevalence areas being the higher rainfall areas of the state: the south-east, Kangaroo Island, Adelaide Hills and the Fleurieu Peninsula.

The nationally reported prevalence in South Australia is 3 percent of flocks infected with virulent footrot and 30 percent infected with the benign form<sup>5</sup>. These estimates are based on reports from State Departments, with the State prevalence of virulent footrot assumed to be double the reported prevalence. However, the actual prevalence of footrot in South Australia is essentially unknown. There are currently 116 infected and 26 suspect properties under restriction for virulent footrot (the latter includes 11 approved feedlots). Figure 4 shows footrot clearances and new detections (virulent footrot only) for the past 5 years. However, as discussed in more detail later, the common perception is that many more properties are infected but undetected/undiagnosed.

<sup>5</sup> [http://herdhealth.com.au/downloads/bahe0327\\_endemic\\_disease\\_economics\\_update\\_nov22.pdf](http://herdhealth.com.au/downloads/bahe0327_endemic_disease_economics_update_nov22.pdf)

Figure 3: 'Heat Map' of the distribution of footrot in South Australia<sup>6</sup>

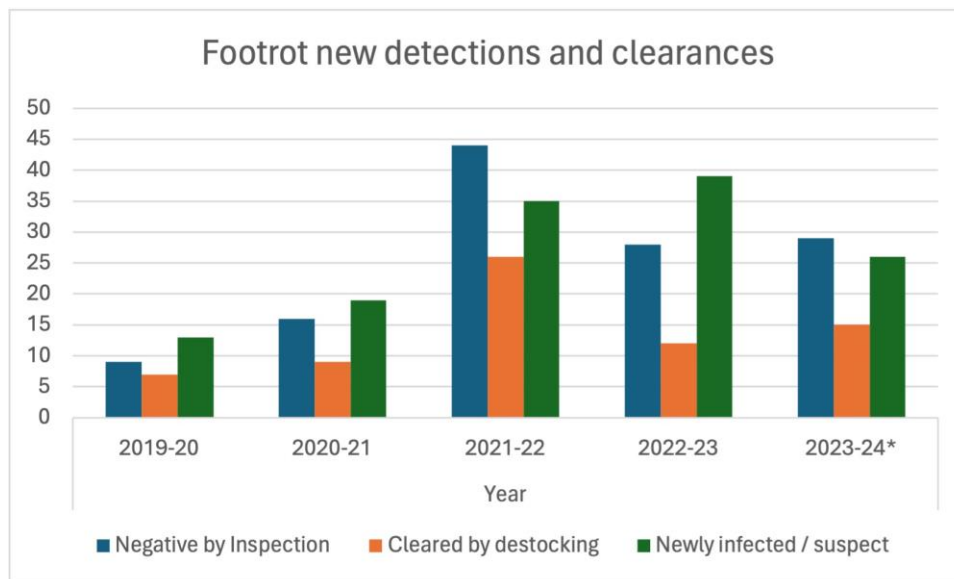


The most recent survey of footrot prevalence in South Australia was conducted in by PIRSA in 2008 when 80 flocks not known to be infected were surveyed from the higher rainfall areas of the state (> 400mm rainfall per annum – total of ~ 2,200 sheep flocks in this area<sup>7</sup>). Of these flocks, 6.25 percent were found to be infected with virulent footrot and 25 percent with benign footrot. The number of known infected flocks at this time was not reported, so the apparent prevalence was not calculated. It should also be noted that 2008 was a drier than average year, hence some infected flocks may have been missed. The previous footrot survey undertaken in South Australia was in 1994. At that time 4 percent of the flocks had virulent footrot and 33 per cent had benign footrot, not considered a significant difference to the 2008 survey.

<sup>6</sup> Supplied by PIRSA. A map of historical footrot detections is also available on the PIRSA website at: [https://www.pir.sa.gov.au/biosecurity/animal\\_health/animal\\_species/sheep/health/footrot](https://www.pir.sa.gov.au/biosecurity/animal_health/animal_species/sheep/health/footrot)

<sup>7</sup> There are current 13,726 active property identification codes (PICs) in South Australia that record the presence of sheep. However, the number of commercial sheep flocks is not known.

Figure 4: New detections of virulent footrot and property clearances for the past 5 years.



\* Year to date.

## 2.2 Control / eradication methodology

The current South Australia footrot control program has the following essential features:

- Footrot is notifiable under the *Livestock Act 1997*. This applies to sheep owners, veterinarians, livestock agents, shearers, contractors etc.
- All sheep sold must be accompanied by the national sheep health declaration (NSHD), which includes statements about footrot status.
- Following notification / detection, a diagnosis is confirmed using a combination of physical inspections and laboratory testing (elastase test).
- Although all forms of footrot are notifiable, only cases of virulent footrot are subject to official movement restrictions, although this is not clear from reading externally facing program documentation available on the PIRSA website<sup>8</sup>.
- Sheep from flocks with virulent footrot cannot be sold to other graziers, must not be sold in a public market and must not be allowed to stray onto public roads or neighbouring properties. They can be sold directly to an abattoir for slaughter or fattened for slaughter through an approved feedlot, but must be fit to travel. Other backgrounding or short-term grazing movement requests are risk assessed and granted if the Chief Inspector is satisfied that they won't result in any spread of disease.
- Flocks diagnosed with benign footrot are instructed that they must declare infection on their NSHD. Further, saleyards other than Naracoorte and Mt Gambier won't accept consignments from properties with benign footrot. Therefore, if they elect to conduct an eradication program, PIRSA assists with planning and subsequent release inspections.

<sup>8</sup> Program requirements and procedures are very well documented in the PIRSA internal document, 'Animal Health Manual, Footrot Control Program procedure', but this is not made available to the public.

- Surveillance for new cases of footrot primarily relies on reports from owners, veterinarians etc, tracing associated with new detections, disease investigations and inspection of sheep at saleyards. Abattoir surveillance is not conducted.
- Various education and awareness activities are conducted aiming to improve understanding and reporting of footrot.
- Support is provided to owners of newly diagnosed flocks so that they understand their control options, including eradication. A Property Disease Management Program (PDMP) is initiated by the local PIRSA Animal Health Advisor. It may be formulated in conjunction with a property owner’s private veterinarian.
- Training is provided to livestock professionals so that they can accurately diagnose and provide advice on footrot control.
- Inspections are conducted on flocks to confirm freedom after implementing an eradication program.

For detailed information on control and eradication in individual flocks, Sheep Connect SA with assistance from PIRSA has published *Footrot: A guide to identification and control in the field*<sup>9</sup> and this is available through the PIRSA website. It is also provided to producers in hard copy. The ‘Coopers® Animal Health Footrot Control & Eradication’ manual<sup>10</sup> is another widely used reference in Australia.

To eradicate virulent footrot, there are two basic methods – (a) destocking for a minimum of 14 days or (b) a treatment program.

Eradication through treatment involves controlling footrot during the spread period (typically September to November) followed by inspections during the dry, non-spread period. It may consist of a combination of inspection, drafting of sheep according to severity, culling badly affected sheep (score 3 or higher), paring of feet (removing /exposing affected sections) and foot bathing with zinc sulphate (formalin or copper sulphate baths have also been used, but they are now not considered best practice). Vaccination may be used to aid control and antibiotics may also be used to salvage badly affected sheep.

Two vaccines have been used:

- Footvax<sup>®11</sup> is a killed multi-serotype (10 strain) vaccine registered to aid in the control of footrot in sheep and lambs.
- Strain specific vaccine developed by Sydney University<sup>12</sup>, which is reportedly more useful as an aid to eradication. However, although it has been available in the past, it is currently not registered for use in Australia. There are ongoing discussions happening nationally aimed at resolving the registration issues.

The details of individual programs vary between operators. For example, the PIRSA advisory material says “Bathing time should be a minimum of a slow walk through six metres of foot bath. Standing in the solution for 10 minutes is better.” However, some recommend that bathing time should be for at least an hour. Another variation is a 15 minute foot bath/ day

---

<sup>9</sup> <https://www.wool.com/globalassets/wool/sheep/welfare/footrot/awi-sheep-connect-sa-2020-footrot-a5-booklet.pdf>

<sup>10</sup> <https://www.coopersanimalhealth.com.au/wp-content/uploads/sites/335/2022/06/GetPdf-40.pdf>

<sup>11</sup> <https://www.coopersanimalhealth.com.au/product/coopersovilisfootvax/>

<sup>12</sup> <https://footrotsydney.org/footrot-control-and-eradication/footrot-vaccination/>

for 5 days following foot paring. Timeframes for individual properties are prescribed in the PDMPs provided to affected producers. Paring combined with grinding of suspect areas to expose all potentially infected tissues is currently gaining favour with some operators.

Meticulous application of the program is necessary to ensure success. It should also be noted that each operation is different and programs need to be tailored to individual circumstances. This could include operating separate premises on some farms with different classes / statuses of sheep. For larger flocks, it may be important to keep mobs separate in case of any break downs.

Destocking only suits those with particular types of enterprises (e.g., traders or fatteners) where retention of the genetics is not an important issue. However, there are still production impacts associated with destocking and also the risk of reintroduction of footrot when re-stocking.

For some people, eradication may not be a viable option, for example because of inadequate infrastructure, high probability of reintroduction etc. However, if virulent footrot is present, ongoing control will be required. Control during a spread phase is achieved by either vaccination or regular foot bathing or a combination of both. Design of the specific control program may be complex and expert advice will need to be sought.

### **3. Project Requirements**

For the *Footrot Management Program Review*, Livestock SA required development of a report that:

- Details the current impacts of the program as reported by industry and provide advice as to the veracity of the concerns raised.
- Evaluates options for program amendments to address impacts considering practicality, effectiveness and economics (costs and benefits) for options.
- Undertakes a detail economic analysis on a select number of options to underpin changes to footrot management in South Australia that will guide program changes to improve cost efficiency and program effectiveness.

The report will provide suggested areas for improvements to the current South Australian Footrot Management Program and should consider for each alternative:

- potential changes to footrot occurrence on animal health and welfare.
- disease spread implications, impacts due to increased spread.
- key components that should be reviewed included surveillance/detection, on farm management, trade impacts (restrictions), prevention.
- the costs associated with on-farm management, treatment, and eradication of the disease.
- other issues raised by the management alternatives.
- considerations on trade implications (intra and interstate) of the footrot management program and the options.
- the industry and government costs of implementing the different improvements.



## 4. Methodology

The broad approach to this project required consultation with a wide range of relevant stakeholders, followed by assimilation of the information gained to generate proposals regarding how to improve footrot management in South Australia. Relevant reports and published papers were also reviewed.

The information generated was then further assessed through application of the *Animal Health Decision Making Framework* that was developed as a precursor to this project<sup>13</sup> (see Appendix B).

### 4.1 Consultation

Consultation with stakeholders was conducted using a combination of face to face and virtual / telephone discussions with individual people, plus an on-line survey. For face-to-face discussions, two trips to South Australia were undertaken, taking in the southeast, Kangaroo Island, Adelaide, Adelaide Hills and the Fleurieu Peninsula. People from other parts of the state were interviewed by telephone. The people interviewed included a cross section of industry stakeholders provided by Livestock SA, as well as footrot technical experts. A total of 63 people were interviewed. The stakeholder types and regional locations of people consulted are provided in appendix A.

The on-line survey was made available by Livestock SA through the Survey Monkey platform. It was open to anyone involved in the sheep industry and available from 1 December 2023 until 28 January 2024. It was promoted through a range of media outlets and industry webpages. Overall, 276 individuals responded to the survey. The questions asked were:

1. What is your role in the sheep industry (multiple choice).
2. What region is your farm/do you work (multiple choice).
3. Do you think the current South Australia footrot control program, which costs approximately \$900k/year, is achieving its aims? Why? If not, why not?
4. What benefits do you face as a result of the current SA footrot control program?  
Can you estimate the overall value of these benefits?
5. What costs, if any, do you face as a result of the current SA footrot control program?  
Can you estimate the overall value of these costs?
6. What changes (if any) should be made to the program? (for example, increased or decreased regulation; changes to support for individual producers; improved control methods; deregulation etc).  
Why do you believe this change is/isn't necessary?

---

<sup>13</sup> Final Report to Livestock SA: *Animal Health Decision Making Framework*. December 2023. Peter MacIntyre, Michelle Hall and Ron Glanville.

## 4.2 Application of Animal Health Decision Making Framework

The information gained through consultation and research was then analysed using the *Animal Health Decision Making Framework* developed for Livestock SA (see Appendix B). The purpose of the assessment was to identify the preferred option using the available data and information through a process that provides the greatest transparency. A multi-criteria analysis (MCA) was selected as the best tool to undertake the assessment.

## 5. Issues arising from consultation

### 5.1 Individual interviews

A selection of sheep producers, veterinarians, footrot technical experts, footrot contractors and livestock agents from across South Australia (and interstate where appropriate) were interviewed either face to face or via telephone to hear of their experiences and seek views regarding how to improve the program. The people interviewed were primarily nominated by Livestock SA or PIRSA. A range of issues arose from these discussions, as outlined below.

Although the issues documented in this section were very consistent across a range of stakeholders, it should be noted that there are inherent biases in this approach in terms of how people may have been selected. The additional use of an on-line survey was very useful in providing added confidence in the findings. It is important to note also that many of the issues documented here are opinion or values based and may not necessarily be totally factual. However, for many 'perception is reality'.

#### 5.1.1 Footrot Detection and Surveillance

In recent years, roughly one third of official detections have come from owner reports, one third from saleyards and the rest from other reports. There has been no surveillance for footrot conducted at abattoirs in South Australia since around 2012, as it was considered too expensive and not as sensitive or efficient at detecting footrot as saleyards surveillance. There were also concerns raised by participating abattoirs regarding surveillance driving supply to other abattoirs not under surveillance and the fact that many sheep from high prevalence areas are processed interstate.

Although routine inspections are performed by PIRSA inspectors at sheep sales throughout the state, for the spring selling season in 2023, following negotiations with industry, PIRSA advised that they would not conduct active surveillance for footrot at terminal sheep only markets in the Southeast (Naracoorte and Mount Gambier). However, inspection would still be required for lice, animal welfare and NLIS compliance. This arrangement arose because people were avoiding these saleyards and selling their sheep in Victoria, where footrot is largely deregulated. Subsequently, yardings at these two saleyards improved significantly. However, the arrangement was not well understood and some detections of footrot at sales in November 2023 when officers were present for other duties caused considerable angst amongst agents and producers, with the effect that many started to sell into Victoria again.

This illustrates probably the most significant issue with the current program in that there is a real fear of being 'caught' because of the consequences of being placed under movement restrictions, which reduces income options<sup>14</sup>, plus the cost of eradication. The impacts will be discussed in more detail later.

Footrot inspections are not a major issue at saleyards in other (drier) parts of the state, as detections are relatively rare, and people support the notion that there should be a high level of control of footrot. It should also be noted that saleyards managers have a responsibility to inspect sheep, but they have had minimal or no training and there are competing time priorities. There are no saleyards on Kangaroo Island, with sales through the AuctionsPlus on-line system reportedly increasing. For these sales there is a mandatory footrot status declaration, but no inspection of the sheep.

Even though footrot is legally notifiable, owners' reports are relatively low, also owing to the fear of consequences. This was a widely acknowledged issue across all stakeholders. The view was expressed that owners tend to report if they have had a problem for a while and they can't get on top of it. That is, often people hide the presence of virulent footrot as long as possible and only ask for help as a last resort. People who self-report were also seen to be unfairly penalised. Some who had experienced footrot even stated they wouldn't have reported the disease in hindsight. Shearers and other contractors often report that they've seen footrot on other properties but will not report this owing to fear of repercussions. Most producers interviewed who had infection currently or previously claimed that they had one or more infected neighbours who were not under movement restrictions. This is difficult to substantiate, but was a very commonly expressed view, presumably arising from discussions between neighbours.

It should also be noted that all forms of footrot (benign and virulent) are notifiable. Since introduction of laboratory based diagnosis, roughly two thirds of cases notified as benign have been classified as virulent using the elastase test. However, it is more common for producers to report more severe clinically virulent footrot because it is more obvious. "Everyone doesn't have footrot, but many get scald".

Given the above, the sensitivity of detection is probably quite low, particularly in the high prevalence areas. As one producer put it, "It is the luck of the draw if you get caught'. Others said that the regulations tend to sweep footrot under the carpet, which is counter-productive to the aims of the program.

This view was shared by PIRSA field staff who acknowledged that they are only dealing with the 'tip of the iceberg'. They also pointed out that it is very difficult to gain entry onto properties without direct evidence of footrot. For example, affected producers often stated during interviews that one or more neighbours has footrot, but this level of evidence cannot be acted upon.

There were also a number of comments that better diagnostic tests are required, given the time taken to get a result (unavoidable with the elastase test) and some confusion around the line between benign and virulent forms of footrot was evident.

---

<sup>14</sup> This is despite the fact that from an ethical perspective, people who have footrot infected sheep should not knowingly sell them to other sheep producers, at least without full disclosure. This is what the current regulations are seeking to avoid.

### 5.1.2 Prevention

Generally speaking, the average commercial producer seemed unaware or discounted the risks associated with introducing sheep from other properties and many took few precautions. Sheep producers who had experienced outbreaks generally attributed it to either purchased sheep (including rams) or an infected neighbour. Some practice preventative foot bathing if sheep from a neighbour gets into a mob. However, use of quarantine paddocks for introduced sheep does not seem to be a widespread practice.

Stud producers interviewed were very aware of the risks from footrot (given the potential impact on their ability to trade) and some have made very serious attempts to prevent its entry, for example, closed herds, quarantining & foot bathing any purchased rams, exclusion or double fencing, preventative foot bathing, boot cleaning requirements etc. Two studs that had experienced outbreaks, despite precautions, could think of no likely cause other than contaminated boots being worn onto the property into yards or shearing sheds (note – one footrot expert consulted thought that this was a low probability; another who knew the properties involved considered it likely). For exhibiting sheep at events, one stud producer has gone to the extent of only using their own exhibition trailer that includes integrated pens and antiseptic mats for people to use before entering the trailer. One specific issue raised by a number of stud producers was the need to improve the footrot protocol for entry into the Adelaide Show, particularly for interstate rams.

A number of people expressed a strong view that the industry culture needs to change so that purchasers take responsibility for this aspect of footrot prevention. This may need to be supported by a stronger footrot status declaration system. Currently it is mandatory to complete the National Sheep Health Declaration (Q3. *All consigned sheep are from a flock that is free of virulent footrot? (Y/N)*; Q4. *All consigned sheep are from a flock that is free of benign footrot or scald? (Y/N)*). However, there is little confidence amongst producers regarding the dependability of the statement, with many considering that producers play ‘lip service’ to it. It was reported that it is often completed by the owner’s livestock agent, although this is not consistent with evidence from audits conducted by PIRSA staff. It is important to reiterate that producers must have knowledge and understand the implications of declarations that they sign.

Some people also commented that the industry should develop a culture of inspecting and foot bathing for all introductions (part of an on-farm biosecurity system). “This is simply smart business”. “Should suspect everyone - if you’re going to trade, know the game you are playing”. However, the perception is that generally people don’t worry about purchased stock (“in the old days they always went through a footbath”). Further, the ‘One Biosecurity’ system that has been developed and promoted by PIRSA has not seen widespread adoption to date, which indicates a significant challenge in relation to changing the existing culture.

A commonly raised issue was the lack of consistent truck washing between mobs of sheep, particularly for property (or saleyards) to property movements. One stud producer interviewed will only transport rams using their own truck.

Saleyards were generally seen to be a high-risk environment for transmission (as well as knowing the status of the sheep being purchased). One person even suggested banning saleyards, at least for sheep moving to a sheep property, for example, for restocking.

### 5.1.3 Industry Attitudes

As indicated above, there is a general ‘fear of consequences’ of footrot detection amongst sheep farmers, particularly in the southeast and on Kangaroo Island. A common view was that the disease is widespread and comes and goes depending on the season, therefore should be deregulated. None want it, but most seem prepared to manage it at a low level and live with it. Many also believe that it is impossible to get rid of.

People interviewed from other parts of the state either had few concerns about footrot (or the current program), or preferred to retain a high level of control. However, they did acknowledge the problems with the current system and often just avoided buying sheep from the higher prevalence areas.

A poor understanding of the different forms of the disease was also evident, with ‘just clover scald’ being a commonly used term. Further, the production impacts are often poorly understood, only being obvious when clinical virulent footrot spreads within a flock. As one producer stated, “If only around five percent production loss, then most wouldn’t notice the impact”. Despite this, one contractor pointed out that people are often surprised at the performance improvement when footrot is controlled or eradicated: less fly strike, better wool, heavier sheep.

Irrespective of the productivity aspects, most people acknowledged the severe animal welfare impacts of virulent footrot and considered that, unless properly managed, this presents a reputational risk to the industry. It is understood that there has already been an increase in the number of suspected footrot cases reported by the public owing to animal welfare concerns.

The actual impact of the movement restrictions varied greatly, depending on the type of operation. For example, for a producer who sells primarily to abattoirs, the cost implications are minimal. However, at the other end of the spectrum, for a stud producer the impact on sales can be devastating.

Irrespective of production system, unless destocking is an easy option, the cost of eradication was seen as high. Most people also reported a high level of mental stress (“foot rot doesn’t scare me, the system does”; “The uncertainty if you get it is a big issue”).

Further, producers who have eradicated footrot all made the point that it is difficult, costly, stressful and that you have to be meticulous in implementation. “That becomes the priority for the year”. It was also recognised that for some, eradication may not be a viable option, for various reasons. For example, one farmer interviewed who is under restrictions was not intending to eradicate, stating that it was too much work for a large enterprise, plus he had 20 neighbours, some who he understood were infected (although not under restrictions), and fences were a problem, hence there is high probability of re-introduction. Effective control then becomes the priority.

Regarding farmers’ relationship with PIRSA staff, most farmers acknowledged that administering the current program is not a pleasant job and there was generally a high regard for them. Some people reported excellent service and support from PIRSA staff. However, there were some who had a very negative view and thought that PIRSA should be there to help farmers, rather than the current approach. PIRSA staff acknowledged that they

often have to deal with aggressive responses from producers. Despite some excellent expertise within PIRSA, people tend to be reluctant to ring PIRSA staff owing to a 'culture of fear'. Reportedly, some PIRSA staff have resigned from the job owing to the nature of the footrot program work and the negative way that producers interacted with them.

Regarding livestock agents and saleyard operators, those operating in the high prevalence areas do not believe that the program is achieving its aims and all suggested that the disease has a much higher prevalence than indicated by official figures. They see a big problem with the different approach across the Victorian border, with people selling their sheep in Victoria if they have doubts, yet Victorian sheep are viewed as coming into SA with minimal controls (up to 40 percent of yardings in the southeast). They all would prefer to de-stigmatise footrot and move to the Victorian system where the owner manages the problem and buyer beware applies.

Agents and/or saleyard managers in the mid-north did not have the same concerns with the program, although one agent had the view that footrot should be deregulated ("the days of regulating endemic diseases are over").

#### **5.1.4 Support for footrot affected producers**

A commonly expressed opinion from farmers and agents was that there is insufficient footrot information available in an easily digestible form. The view from footrot contractors and veterinarians was that there is plenty of information available, but farmers don't take it in. "Farmers also put on a brave face, but are often just fearful". This probably reflects the fact that it is a complex disease and people usually need to be carefully taken though it; often more than once. Programs should also be tailored to the individual situation. "It is complicated and not easy, with lots of variations, yet farmers want simplicity".

As indicated earlier, the broader issue of on-farm biosecurity is also not well understood.

In light of the above, there was a common view across all stakeholders that not enough advice and help is available to infected producers. This is influenced by:

- PIRSA resources are stretched, and their primary role is surveillance, diagnosis and clearance inspections. Some officers already devote significantly more of their time to footrot control than is funded through the program.
- There is a shortage of veterinarians with sufficient experience in footrot to provide the services required. Not many private veterinarians have a good understanding of the disease.
- Sheep producers generally do not use veterinarians and many veterinary practices in rural areas are moving away from livestock services (confirmed in other studies by this author).
- Similarly, there are insufficient contractors available who provide the services required to control or eradicate footrot (for example, hoof paring). This could be a 'chicken and egg' situation. One busy contractor considered that there is a significant business opportunity under a deregulation scenario, where people felt they were able to be more open about controlling footrot. "It is a better job than crutching".
- There is more than one eradication method used when advising producers (see section 2.3). This may be a source of confusion.

### 5.1.5 Costs

Footrot infection may cost producers in terms of lost market opportunities (e.g., lost ram sales), reduced value of animals (e.g., slaughter value only), delayed sales, lost reputation, production losses, the cost of control or eradication, required infrastructure upgrades (e.g., fences), animal welfare impacts and mental stress. During interviews, a range of these costs as experienced by producers were recorded and are summarised below. These are provided as indicative estimates only, and some aspects will vary with season and market fluctuations. Published estimates of the cost of footrot infection are further discussed in section 6.

The marketing impacts of a positive footrot detection vary significantly according to the type of operation, with stud producers suffering most and those that only sell to abattoirs the least affected. However, the cost of eradication is generally very significant for all producers, unless destocking is feasible and has minimal impact. Further, unless implemented meticulously, there is a high chance of failure, in which case the program (and associated costs) need to be repeated. It appears that many producers simply do not have the capability (for various reasons) to eradicate. Others may be able to eradicate but have ongoing risks of re-infection from neighbouring flocks.

A point was made that even if footrot has no significant direct impact on a property (for example, running a less susceptible breed), if introduced, it may then impact on that property's neighbours.

In terms of direct costs/losses:

- One producer has spent \$400k over 5 years trying to eradicate and still had a few positive animals (5,000 head flock).
- A producer who decided to destock his infected block with 700 ewes, 90 lambs, 20 rams; estimated it cost him approximately \$25k, not including labour and production losses (in the order of another \$5k). Note that destocking, even if restocking occurs soon after, nearly always results in production losses.
- If mainly selling prime lambs, the impact is minimal, apart from the treatment costs.
- A producer with a large property has been trying to eradicate for a few years, but has found it logistically difficult. Estimated \$150k loss over two years (mainly impact on sales, as production loss has been minimal owing to regular foot bathing). He has now commenced establishment of a clean flock on a new property.
- Another who has decided to get out of sheep estimates a \$500k opportunity cost in the first year and \$250k in the second year (the business was selling store lambs). Also, old ewes expected to sell for \$110 returned only \$50 over the hooks.
- A stud breeder had a sheep detected with clinically benign footrot at the Royal Show, which was subsequent confirmed by herd inspection and laboratory testing. The consequential reputational damage meant that he didn't regain full market reputation for a few years. This meant a reduced sale price of rams of \$4-500/head (as well as considerable stress).
- Another stud producer has had to eradicate twice at a total cost in last 10 years of \$3-400k, plus losses from having to sell stock for slaughter (e.g., \$100 for sheep that would normally bring \$250).

- Another producer eradicated footrot in one year but estimated costs in the vicinity of \$1m: eradication costs \$300k, the remainder in lost sales and sending valuable culls to abattoir at much reduced price. “The stigma was worse than the disease”. Has now also double fenced the property.
- One large merino producer who currently doesn’t have capability to eradicate (too many infected neighbours with inadequate fences) is spending \$25-30k per annum on control and estimated an ongoing 10% production loss (which equates to 30% of profits). Estimates that it would cost at least \$150k to eradicate, probably more.
- One merino producer who is infected quoted \$1.85/kg vs \$3.20 if uninfected for cull sheep.

In relation to production impacts:

- Most acknowledged that this is difficult to quantify, particularly if the producer treats regularly. One veterinarian suggested average production losses in the order of 10-20%, but this can be much more severe where there is virulent footrot.
- If there is only around 5% loss, then many producers wouldn’t notice the impact.
- It was also suggested that often people only realise what impact footrot was having after it has been controlled (particularly merino producers). One producer who eradicated, reported a 20% improvement in production.
- For most producers where on-farm prevalence is low and they sell fat lambs, the actual impact isn’t high.

Contractor / vet costs:

- These vary from regular inspections (\$0.80 per head per inspection) to inspect & treat, \$3-5/head.
- One veterinarian suggested that the cost to eradicate is ~ \$12/head (including Footvax).
- However, a commonly quoted figure is \$10/head plus vaccine etc.
- Foot paring is very time intensive. Some producers are taught how to do it properly themselves; others use contractors (e.g., \$600/day).

All producers who had been through a program reported significant mental stress and there are also opportunity costs, given the time commitment that is required.

The animal welfare impacts of footrot were emphasised by a number of people (“cruellest thing a sheep can go through”) and some made the point very strongly that this could negatively impact on the image of the industry if it became more widely known by the general public.



## 5.2 Industry survey

A total of 276 people responded to the on-line survey, including 250 sheep producers, 21 livestock agents, 10 veterinarians, 22 contractors/consultants, 8 industry representatives and 3 from government. Most production regions were represented (see Table 1 below), although the southeast was possibly over-represented, with 44 percent of respondents. Adelaide Hills and Kangaroo Island were also well represented. This possibly indicates that people in the high prevalence areas have a greater level of concern with the program and hence were more likely to respond.

*Table 1 Distribution of respondents by region*

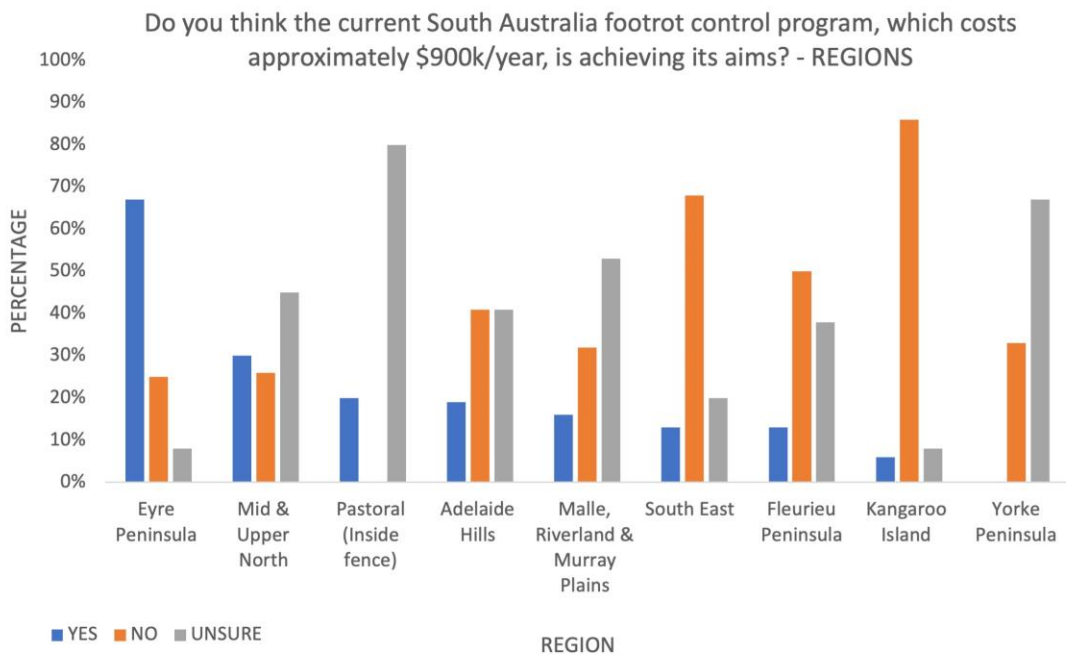
<b>Region</b>	<b>Number</b>	<b>Percent</b>
South East	123	44%
Mid and Upper North	47	17%
Kangaroo Island	37	13%
Adelaide Hills	32	12%
Mallee, Riverland and Murray Plains	19	7%
Fleurieu Peninsula	16	6%
Eyre Peninsula	12	4%
Other	12	4%
Pastoral (inside the dog fence)	5	2%
Yorke Peninsula	3	1%
Pastoral (outside the dog fence)	0	0%

Overall, 55 percent of respondents did not consider the program to be achieving its aims (question 3), with a further 28 percent unsure. However, this varied significantly by region (see figure 5), with the southeast, Kangaroo Island and Fleurieu Peninsula (the high prevalence regions) being most dissatisfied. The Eyre Peninsula, mid and upper North recorded the highest satisfaction rating, but this was still only 37 percent.

In terms of stakeholder types, no government people answered 'no' to question 3, although 67 percent were unsure. One hundred percent of contractors, 93 percent of consultants and 71 percent of livestock agents answered 'no'.

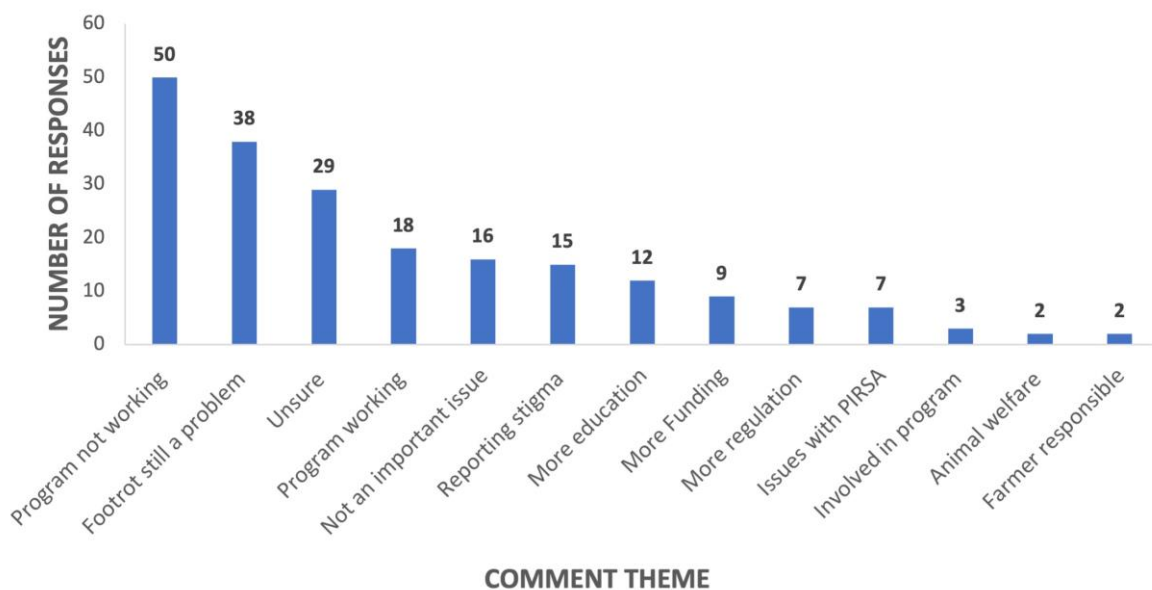
This result is consistent with the feedback obtained during individual interviews.

Figure 5: Is the program achieving its aims, by region?



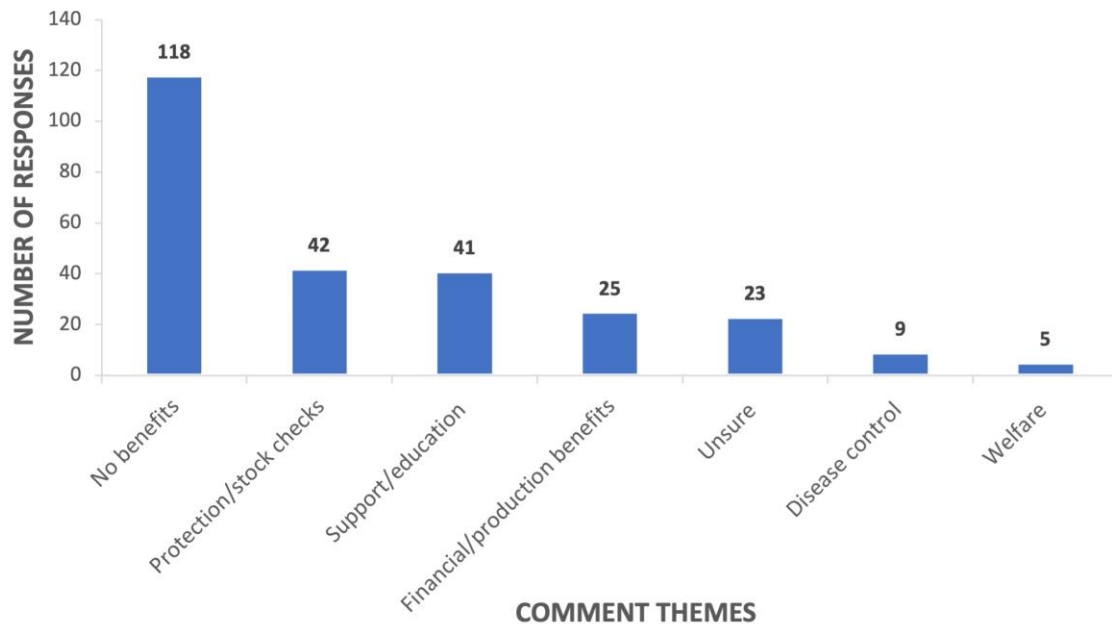
A range of individual comments were also provided under question 3 and these were allocated to themes as shown in figure 6 for illustration purposes. This and the individual comments indicate a range of views, both positive and negative, often reflecting people’s experience, individual circumstances and the region where they live. They are broadly consistent with the issues documented under section 5.1. The issue of under-reporting because of the fear of consequences does not come through as strongly as it did in the interviews, but there were still a large number of comments essentially saying that the program is not working in its current form.

Figure 6. Themes for question 3 comments.



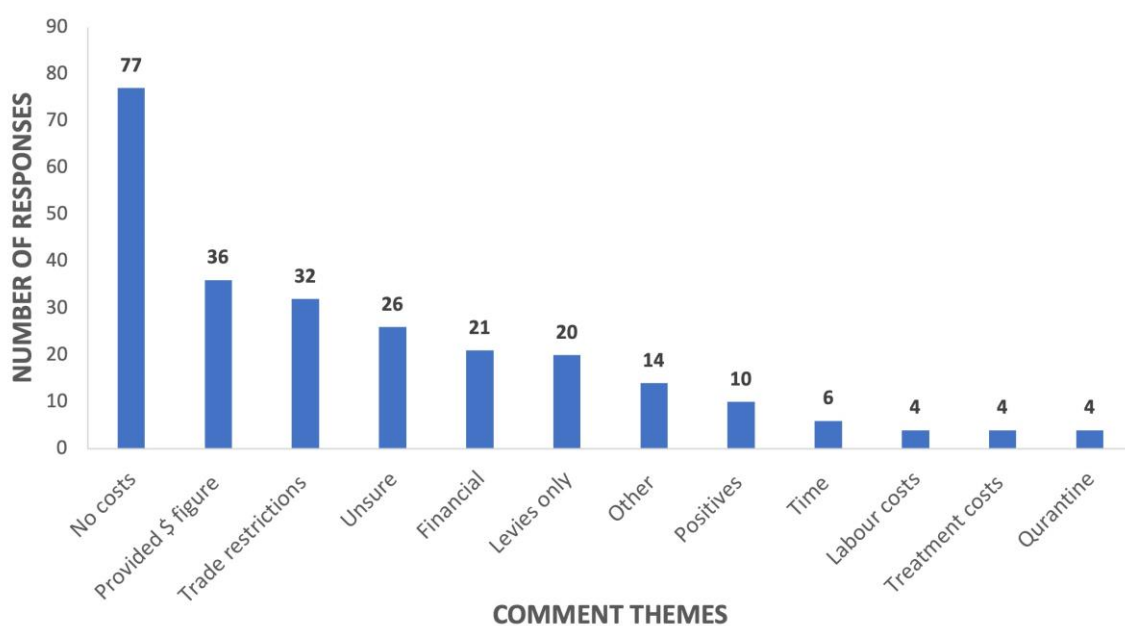
Disappointingly, 45 percent of respondents indicated that they receive no benefit from the program, with some also saying they were unsure (question 4). These results are summarised in figure 7. However, a range of benefits were recognised, including protection from footrot, production benefits and support & education.

Figure 7: Benefits from the current SA Footrot Control Program.



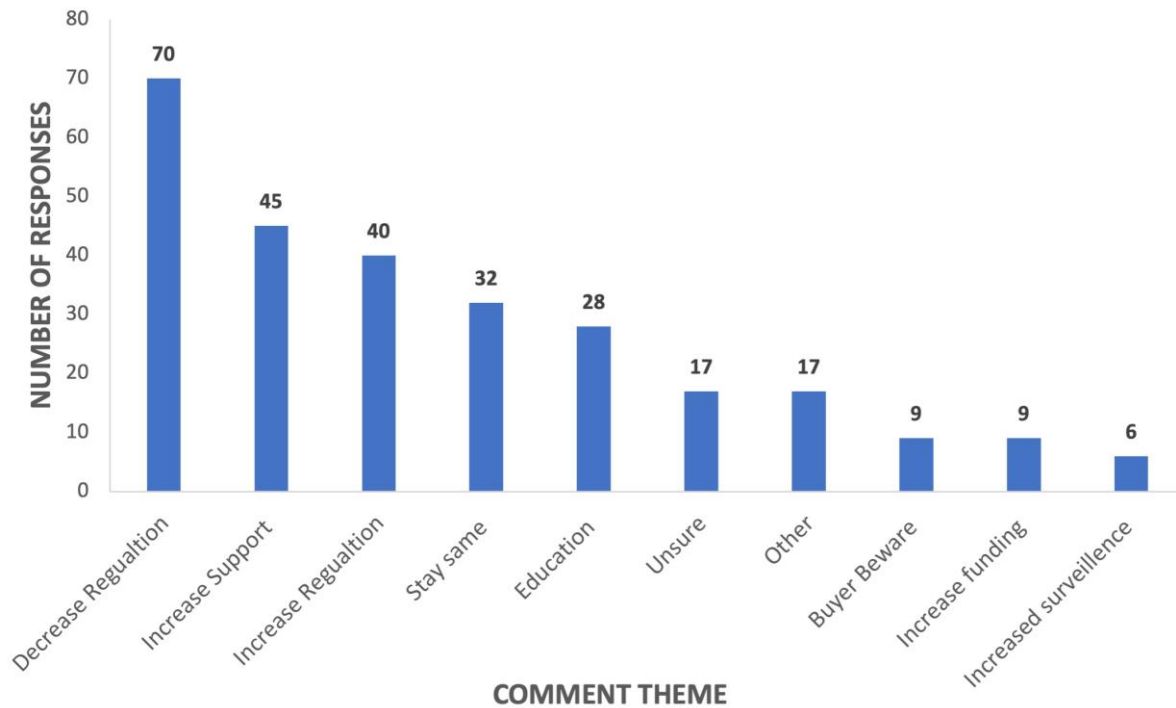
Question 5 asked people to indicate what costs, if any, they face as a result of the current SA Footrot Control Program (see figure 8 for a summary). The detailed answers provided largely reflect the range of costs documented in section 5.1.5, including production losses, control costs, eradication costs, market access restrictions, levies and mental health impacts.

Figure 8: Costs people face as a result of the program.



Answers to question 6 regarding what changes should be made to the program, highlighted the diversity of opinions there are in relation to this question. Seventy people suggested decreased regulation, while 40 recommended increased regulation and 32 suggested no change (figure 9). The other significant area suggested for change was more support and education, which was often linked to calls for deregulation. Again, the responses were generally consistent with those reported in section 5.1.

Figure 9: Changes that should be made to the program.



For question 7, 'why do you believe this change outlined in response to question 6 is/isn't necessary?', a wide range of answers were provided. However, the themes that stood out were those documented earlier, particularly encouraging people to take a greater responsibility, reducing the stigma, more efficient use of resources and the need to address animal welfare aspects.

As a more general observation regarding the responses to the survey, there appears to be two main 'camps': those that suggest that the existing program should be strengthened with stronger surveillance and regulation, together with increased funding; and those that argue for a level of deregulation, together with more support for people to take greater individual responsibility for control. In this survey, the latter camp was the most vocal.

### 5.3 Summary of key issues

Currently there are around 142 properties under movement restrictions for virulent footrot across South Australia. Significant social stigma and fear of the consequences is associated with 'quarantine' (farmers use the word, quarantine, even though they are not officially under a quarantine order). Many are even reluctant to report it to their veterinarian. Hence, there was a widely held view across all stakeholder groups that the fear of consequences leads to very significant under-reporting of footrot and the true prevalence is much higher than the apparent prevalence. This is counterproductive.

The actual prevalence of benign and virulent footrot is unknown, but people commonly suggested that the true prevalence is around 50% or more of farms infected in the high prevalence areas (varying levels of within farm prevalence). Others estimated 70-75%. On Kangaroo Island, there are currently 35 properties under restrictions out of > 300, yet most people estimate at least 70% farm level prevalence.

For sheep properties in other parts of South Australia such as the north and mid-north, apparent prevalence levels are much lower, largely owing to the less favourable environment for footrot. Producers interviewed from these areas generally had less awareness of footrot, but nevertheless were concerned that it remained under control.

For many in the high prevalence areas, on-farm prevalence is probably at a low level, but this can change quickly in seasons favourable to footrot. Anecdotally, large volumes of zinc sulphate (for foot baths) are being sold to properties not under restrictions and also significant numbers of new foot baths are being installed, possibly indicating an ongoing, underlying problem, or at least increased awareness of the risks associated with footrot.

In making the above estimates, no distinction was made between benign and virulent footrot, although often people made a distinction between footrot that is serious and "just clover scald". Irrespective, it should be realised that these figures are anecdotal at best. However, this widely held view is significant in itself.

Given the above, it was generally acknowledged that the program doesn't sufficiently suppress footrot overall, although it has probably reduced the number of severe, virulent cases. Naïve flocks suffer the greatest impacts from footrot and PIRSA has estimated using NLIS data of previous sales from known newly infected flocks that in the 2022/23 season, movement restrictions prevented around 70 new infections each year. However, the program also provides a false sense of security that footrot is under control and hence doesn't adequately protect people from the disease when purchasing stock from flocks that may be infected but undetected. In the 2008 survey 6.25 percent of flocks not previously known to be infected were found to be infected with virulent footrot. It seems that the probability of introducing footrot when buying stock remains high, hence the 'smarter' operators inspect purchased sheep themselves or pay a contractor.

The program is commonly seen as a 'government thing' (and authoritarian), even though it is industry funded. Hence, people don't take individual responsibility. It is also complicated and difficult for producers to understand.

As indicated earlier, there is still a significant cohort of industry that would prefer to see the current approach, or a strengthened version, retained. Ultimately, if this is not the path chosen, it is important to listen to their concerns, which presumably are around protection

of the industry from the spread of disease. Hence, any revised program should be strong on options for people to purchase disease free sheep.

Although eradication of footrot from a property is not mandatory, it is often seen that way. Most people would be happy to just keep the disease at a low level where it doesn't cause significant production losses or animal welfare issues. "We don't take this approach with other endemic diseases, which are the owner's responsibility". However, for some, eradication makes sense provided they can maintain freedom and hence, don't have ongoing control costs. Further, where virulent footrot is present it can quickly become out of control under the right environmental conditions.

For people who have attempted eradication, some achieve this in one year, but many fail. The general opinion and experience is that successful eradication depends on meticulous application of the key principles. Sources of failure include incomplete musters, not paying attention to putting treated sheep into 'clean' paddocks, lack of attention to sheep 'flows' through yards, and paddocks, contaminated yards, insufficient foot bathing times etc.

It should be acknowledged that eradication is not for everyone, and good control is acceptable. Consequently, all producers with a footrot problem should have access to good, reliable and clear information upon which they can make an informed decision on the best approach for their situation.

The findings from the individual and on-line consultations are in broad agreement with a 2016-17 southern Australian study by Best et al<sup>15</sup>. The authors highlighted the complexity of footrot, as well as the negative impacts associated with the social stigma that often follows a diagnosis. This leads producers to often make inappropriate control decisions. They recommended that the burden of responsibility should be shared by governments and sheep producers. Governments need to make an effort to generate trust among the sheep producer community, working in collaboration with them rather than dictating to them what to do or leaving them on their own coping with risks that can affect the whole of the industry.

---

<sup>15</sup> Best, N., Menéndez, R., Rawlin, G., Suter, R., Rodoni, B., Beddoe1, T. The Consequences of Stigma for Knowledge Production: Sheep Producers' Attitudes to Footrot Diagnostics and Control in Australia. *Frontiers in Veterinary Science* (2020) 7: 354. doi: 10.3389/fvets.2020.00354

## 5.4 Possible program enhancements

A range of improvements to the current footrot control program were suggested by and/or discussed with people interviewed. These are summarised and discussed below.

### 5.4.1 Level of investment

Many people interviewed considered that the total amount invested in the program is inadequate. PIRSA staff confirmed that their resources are stretched, and that staff often devote more time to the program than the funding provides for. A common view from industry also was that PIRSA should match the industry investment. One person expressed that if the program can't be funded adequately, then the industry should walk away.

Many interviewed thought that the existing funds would be better invested in measures like better support for farmers, a subsidy for foot baths or vaccination and more research & development on improved control methods and laboratory tests (expanded on below).

Any decisions around ongoing funding and the quantum will ultimately depend on the decisions made subsequent to consideration of this report, particularly overall program design.

### 5.4.2 Overall program design

Most people interviewed agreed that producers need to take more individual responsibility for footrot control and prevention. Further, there is a need to revisit the aims of the program for the future, for example, eradication, and/or effective control and/or address animal welfare aspects. No-one suggested that eradication from South Australia was realistic, but supporting individual producers to eradicate should remain an objective and local area eradication was also suggested (groups of producers).

Many thought that the aim should be to reduce the economic impact of footrot and improve animal welfare by teaching and supporting farmers, providing options and building incentives into the system (for example, to control movements onto their properties). However, most found it difficult to envisage specifically how incentives would work.

'Buyer beware' was also a common theme - "there is no place for non-professionals within the industry". While this is a worthy and logical sentiment, the reality is that there are roughly 13,700 registered sheep properties in South Australia and there will be a wide range of operations and professionalism within that demographic.

Deregulation was also a common theme (see below), but it was also acknowledged that there is a 'catch 22' here, that is, how to maintain pressure on people to manage footrot, but at the same time remove the stigma. Most people acknowledged this dilemma but had trouble suggesting a solution. Apart from the many calls for deregulation, only one person offered a more comprehensive opinion regarding the future design of a program in South Australia, viz:

*Key elements:*

- 1. Readily accessible, affordable expert advice without fear of repercussions.*
- 2. Leveraging the private sector.*
- 3. Ensuring sheep producers own 100% of the responsibility to not get the disease.*

### *Ingredients:*

- 1. A core group of SA private veterinarians trained (including field experience).*
- 2. A source of clear correct credible information on how to keep footrot out of your flock.*
- 3. A source of clear, correct credible footrot control and eradication information.*
- 4. Affordable access by SA veterinarians to footrot gurus (could act as paid mentors).*
- 5. Do not fully “deregulate” footrot; meaning keep it on the list of notifiable diseases, which carries with it certain obligations to prevent spread, but any regulatory enforcement action by government is only taken as a last resort for recalcitrants.*
- 6. Keep government involvement in footrot to an absolute bare minimum, as close to zero as possible. Any involvement of government simply serves to disempower the private sector, and it distracts government vets from doing other important EAD preparedness work.*

### **5.4.3 Program management**

Although the SA footrot program is industry funded, it is often seen by producers as a PIRSA (government) program, with associated negative connotations. This is to an extent a consequence of it being a regulatory focussed program with a long history. When suggested, there was wide agreement that there should be more active industry involvement in program design and management. There have been many examples in the past where this has occurred with animal health programs across Australia, with positive impacts in terms of more effective program design and better industry ownership of the program.

This may require a state level committee approach, but there were also suggestions of local area committees to bring producers together. From experience, these approaches work best when driven by industry rather than government.

### **5.4.4 Regulation or deregulation**

Central to the issue of the design of a future program is the degree of regulation applied. Most people thought that deregulation would increase reporting (or at least people being more open about seeking help), given that the current regulations were universally seen as a disincentive to reporting. However, not all were prepared to commit to full deregulation (“need less big stick, but letting go is scary”). Even the people who preferred to retain a stringent, regulatory approach to footrot acknowledged the problems that this creates in terms of lack of reporting etc.

Although deregulation (like Tasmania and Victoria<sup>16</sup>) was favoured by a majority in the southeast, overall there was a view that retention of some sort of regulatory ‘safety net’ was desirable. For example, this could mean PIRSA retaining the ability to take action in the case of badly affected flocks or mobs, with a focus on animal welfare. This was consistent with a

---

<sup>16</sup> Footrot is not totally deregulated in Victoria. It remains notifiable, with the ability to take action in relation to severe cases. However, it is understood that this rarely occurs.



number of people who suggested that regulation should only be used when there are animal welfare problems. “Keep ‘em honest”.

There could also be a retained provision that “it is illegal to trade clinically affected sheep” or “it is illegal to trade sheep known to be infected with virulent footrot” (except for slaughter or for fattening, and even then, sheep must still be fit to load), or some variation on these. Another person suggested that more stringent requirements should be placed on seed stock producers.

It should be noted that partial deregulation as suggested above could present challenges within the State’s existing disease control legislation (not applying movement restrictions for a notifiable disease). However, the new Biosecurity legislation currently under development should provide more flexibility in this regard, for example, utilising the General Biosecurity Duty / Obligation that is a feature of other jurisdictions’ biosecurity legislation. Using this mechanism, the existing notifiable provisions could be removed and replaced with a general duty along the lines of “sheep producers have a duty of care to not spread footrot to other sheep properties”. If introduction of the new legislation is delayed significantly, then regulatory amendment may be required.

Deregulation of the supply of footrot vaccine was also seen as an important move to encourage more widespread adoption. Anecdotally, some producers already purchase the vaccine from Victoria where its use is not regulated.

There may also be a need to strengthen or at least clarify existing rights in relation to the purchase of stock where disease is found subsequent to sale. That is, under what circumstances should the sale become null and void.

#### **5.4.5 Education, awareness and support**

There was a widely held view that there is insufficient education of farmers generally and insufficient support available when footrot is detected. It was also stated that farmers (and many industry professionals) generally don’t know how to identify footrot properly and there is a lack of understanding of the basic epidemiology, prevention, detection and treatment methods. This is not surprising considering the complexity of the disease and was reinforced during interviews with producers who had never experienced footrot.

It was pointed out by a contractor that lots of information is provided, and more is available (mainly written), but farmers tend not to take it in and need to be talked through the issues. Hence a revised approach may be required, but also within an environment where producers are more receptive to receiving information (footrot de-stigmatised as discussed elsewhere).

Regarding a revised approach, suggestions included a need for more practical demonstrations of disease, its identification, how to foot pare etc. This view regarding lack of information and support was not as evident on Kangaroo Island where a veterinary practice has been very active in supporting producers to implement programs. However, there was still the view that producers need more assistance in the form of clear, reliable technical support. An important point made was that producers need to be sure that the advice provided is appropriate, given the high chance of failure of eradication if not done properly.

Use of positive 'cases studies' of producers that got onto their footrot infection early, the positive welfare outcomes, successes, lessons learnt and what they would do differently next time was also suggested.

A significant issue is that there are different ways to achieve eradication that are being recommended by contractors and vets. This does not mean that any particular method is wrong. However, there may be a need to bring this all together (for example, in the Sheep Connect footrot guide) so that people can consider the different options, but be confident that they are technically robust, and can be tailored to individual situations.

As indicated earlier, this issue is compounded by a lack of properly trained footrot contractors and private veterinarians willing to service the industry. Some suggestions were made how to improve this through provision of incentives, for example, a subsidy on the first consultation following a footrot diagnosis. Existing PIRSA staff are well placed to provide excellent advice to affected producers and a more education focussed role should provide greater job satisfaction. However, currently they are unlikely to be invited onto many properties owing to a level of distrust that has developed over time. This may take some time to change. One suggestion that was well supported was to establish a more industry based, non-government position (e.g., employed by Livestock SA) who could provide advice to producers. Others suggested that this could be achieved by supporting private veterinarians to provide this service. Better education of livestock agents was also suggested so that misinformation is not provided to producers. It is likely that a combination of all or some of these suggestions will be required to ensure that the people not currently receiving professional advice do so.

A counterview was also expressed by some people that many farmers would not take up the opportunity if more education was provided. This is almost certainly true. The question is whether sufficient people would use the opportunity and improve their practices to the extent that the overall impact of footrot across the industry declines.

There is also the question of whether more private veterinarians will have the appetite to be involved in this type of work. Australia is already experiencing a shortage of veterinarians willing to work in rural areas. Further, sheep producers are not big users of private veterinarians more generally.

#### **5.4.6 Improving surveillance**

Another key issue with the current program is that the sensitivity of detection of properties infected with virulent footrot is believed to be low (although not quantified). Any measures to improve this may create further disquiet within the industry owing to the existing fear of the consequences of detection. This is a key argument for deregulation, as in theory, people will be more willing to seek assistance. Under a deregulation scenario official surveillance becomes less important (or not important) as the aim would be for producers to take responsibility and individually seek help to control footrot on their properties.

A few people interviewed advocated for routine abattoir surveillance to be re-introduced, as well as powers for PIRSA to inspect neighbours of properties that are detected as infected. Regarding abattoir surveillance, PIRSA advised that from previous experience, it is a relatively inefficient method of footrot detection and is also expensive. Abattoir surveillance

is apparently more effective in Western Australia owing to different marketing arrangements in that state (most sheep processed through only two abattoirs).

#### 5.4.7 Certification & prevention

Currently, there seems to be poor confidence in the veracity of animal health statements and there is a general view that not many people pay attention to them. It was seen as too easy to say something like, 'no known footrot'. Further, the statement is often routinely completed by the agent, not the owner of the animals. Improving this situation could go a long way to minimising the spread of virulent footrot.

A number of suggestions were offered regarding certification:

- Include a statement in the national sheep health declaration about whether the sheep have been physically inspected (this has been suggested by PIRSA).
- A "Full disclosure" model using a more robust declaration that goes into greater detail about what management practices are in place (do you inspect feet routinely?; do you footbath routinely?; were the feet of these sheep inspected? etc).
- Introduce a requirement for pre-inspection for all store sales. This would be resource intensive.
- Implement a 'chain of responsibility' approach (producer – agent – trucker), similar to what has been implemented in the grains industry (shared responsibility).
- Introduction of a 'certified free', or 'inspected free' status for those wanting added surety (noting that it is virtually impossible to really say a property is free). "Would like to see an opportunity to be able to certify my sheep as free of footrot (either by mob or annual for the property. A premium from buyers would be ideal". The 'One Biosecurity' system provides for this type of mechanism, but has not been widely supported to date. It should also be noted that a system that is based on flock status will be more effective than those based on inspection etc of individual mobs, given the variation in disease expression with seasons.

On the broader issue of prevention, as indicated earlier, producers needed to take a greater level of personal responsibility; both purchasers and sellers, although ideally this would be driven by purchasers through market signals. Specific ideas discussed included:

- The need to heavily promote an on-farm biosecurity system that includes isolation, inspection & foot bathing of introduced sheep. This should become normal industry practice.
- In higher risk situations or climates, this should be combined with routine foot paring/trimming and bathing, noting that a lot of sheep farmers do this already to a greater or lesser extent. However, less farmers practice routine foot paring owing to the labour involved.
- Paying attention to the health status before purchasing sheep, as discussed above.
- Ensuring that producers have access to information on prevalence areas to assist them in decision making regarding where to buy sheep.
- Taking social responsibility for not infecting neighbours was seen as part of this.
- Document the principles and risks associated with risk-based trading (in a deregulated environment). For example, one person suggested that a property with

low-level footrot that is kept under control should be able to buy sheep from a footrot infected property – business opportunity (cheap sheep)<sup>17</sup>.

- A number of people suggested establishment of strategic truck wash-down facilities, given that truck washing is not a routine procedure between mobs and is an obvious point for disease transmission.

Whether any of the suggestions in this section or other variations are ultimately implemented under a future program is a matter for managers and industry considering detailed program design, as discussed in sections 5.4.2 and 5.4.3. Some will be more practical than others, but most require behaviour change on the part of industry participants, which is not easy to achieve.

#### **5.4.8 Subsidies / Incentives**

Various subsidies to encourage people to conduct on-farm control and/or eradication were suggested, for example:

- Subsidised training.
- A subsidy for vaccination where a grazier has self-declared and commits to a recognised program. However, it is difficult to calculate the level of funds that would be required without knowing the potential up-take, particularly if deregulated.
- In a deregulated environment, negotiate a bulk purchase order for vaccine.
- The question was also raised of whether the vaccine price would come down if the volume used increased. This is difficult to say, but a bulk purchase arrangement (say through Livestock SA) could possibly be negotiated.
- Tax incentives were also mentioned, given that there can be significant tax implications associated with destocking. It is understood that tax concessions are currently available but only when animals are compulsorily destroyed under an official Order.

Subsidising on-farm operational costs was also suggested but is unrealistic in terms of the funds available.

Another suggestion was that if supermarket chains and/or abattoirs demanded evidence of footrot control, owing to animal welfare concerns, this would drive on-farm action. This type of driver has proven very powerful in relation to other livestock systems issues in the past. However, unless consumer concerns became more urgent, for a disease like footrot it would more likely that this would be handled as a component of a more generic national accreditation system.

#### **5.4.9 Regional / National Approaches**

A number of people indicated that there should be a national approach to footrot control, not State / regional. This is unlikely to occur owing to the history within each state, unless the national approach was essentially, deregulation.

---

<sup>17</sup> The current program supports 'like for like' trading but this is not clear from program documentation.

There were some discussions around whether the south-east of South Australia (and Kangaroo Island) could have a different approach to the rest of the State (that is, the same as Victoria), given that the border means little in terms of the sheep production region. However, creation of another official disease zone was generally not supported for various reasons. Future program designers could consider how different prevalence areas are accommodated within the overall program design.

#### **5.4.10 Diagnostics**

A number of people expressed a need for better and faster diagnostic tests, as well as better information on the existing tests. Laboratory turn-around times were considered to be too long by many people, but this is largely unavoidable owing to the nature of the test. It is understood that new tests are being explored by some institutions. PCR tests are used in some jurisdictions, but there is scientific debate around which tests are most accurate to classify footrot strains. This is perhaps an issue for Australian Wool Innovation to consider further.

It is noted that at least one very experienced sheep veterinarian in another state currently does not utilise laboratory diagnostics and considers that physical examination is sufficient to adequately diagnose and manage the disease. However, laboratory diagnosis still has a valuable place for providing greater accuracy regarding what type of footrot is present on a property and helping to guide control / eradication options.

#### **5.4.11 Vaccination**

There was a common view that more should be done to improve available vaccines and/or ensure that the University of Sydney developed, strain specific vaccine becomes available again. The latter is being worked on currently. It is noted that this vaccine is expensive and its use is limited to specific situations.

Again, people would like to see better access to the existing vaccine, as it is currently only available following Chief Veterinary Officer approval.

#### **5.4.12 Genetics**

There is a project in New Zealand where people are selecting sheep for footrot resistance (Next Gen Agri<sup>18</sup>). This is difficult to do in SA currently where regulations require notification and eradication or control. This is not a short-term solution, but could possibly be part of the mix under a future program, for example, assisting stud breeders to breed sheep with lower susceptibility to footrot.

---

<sup>18</sup> <https://www.nextgenagri.com/articles/know-more-about-footrot>

## 6. Analysis using Animal Health Decision Making Framework

This chapter undertakes analysis of the various options to manage footrot in South Australia through application of the *Animal Health Decision Making Framework* that was developed as a precursor to this project (see Appendix B). The framework involves working through a structured series of questions to assist it in assessing the merits of investment options.

### 6.1 PESTLEOSS analysis

Table 6-1 outlines the application of the PESTLEOSS framework as it relates to footrot in South Australia.

Table 6-1 PESTLEOSS analysis

PESTLEOSS factor	Analysis
<p><b>Political</b></p> <p><i>Community/industry appetite regarding the disease and any Livestock SA/industry risk tolerance considerations.</i></p>	<p>There are likely to be significant divergent views, irrespective of which future foot rot management option is proposed. The majority of people in the footrot endemic areas would like to see at least some level of deregulation (and this is justified, given the problems with program effectiveness). However, it is likely that this will be opposed by producers in other areas. Any transition will require careful management.</p>
<p><b>Economic</b></p> <p><i>Is it likely that the proposal will generate a net benefit for the SA community/industry?</i></p>	<p>Virulent footrot does cause significant economic impacts to the SA sheep industry. Many of these are unrecognised or poorly understood at the producer level. However, the mitigation costs are currently borne by relatively few producers and only those that are 'caught' by the system. Mitigation generally needs to become normal industry practice. Given the probable level of current underreporting, it is unlikely that the current approach provides more net benefits than other less regulated options.</p>
<p><b>Social &amp; Ethical</b></p> <p><i>Effects on wellbeing, mental health, social connections and animal welfare impacts.</i></p>	<p>The social / mental health impacts on producers under restrictions is often significant and any future program should seek to minimise these. The animal welfare impacts of footrot are very high if not controlled and this could also negatively impact on the social licence of the sheep industry. With the current program there is also significant distrust between government and industry.</p>
<p><b>Technical</b></p> <p><i>Technical feasibility (including timeframes) and options to achieve outcomes.</i></p>	<p>The technical aspects of footrot control are well established. However, eradication is resource intensive and expensive. Readily available information in a form suitable for farmers is also sub-optimal. The primary technical issue with the current program is poor detection of infected properties. Abattoir monitoring is not used and saleyards monitoring is compromised, with owner reporting being the most important method used.</p>

<p><b>Legal</b></p> <p><i>What is Livestock SA's/PIRSA's legal remit (Regulations, objectives, clashing legislation etc.)</i></p>	<p>The legal basis for the current program is well established. The issue is more around whether a level of deregulation should occur, given that the current regulatory arrangements have led to under-reporting.</p>
<p><b>Environmental</b></p> <p><i>Environmental impact of the initiative</i></p>	<p>There are no significant environmental issues.</p>
<p><b>Operational</b></p> <p><i>Organisational capability and capacity</i></p>	<p>There are insufficient veterinarians and contractors with the required knowledge and experienced to serve the needs of the industry. PIRSA resources to manage the program are probably also sub-optimal. Many sheep farmers do not have the capacity or capability to implement an eradication program.</p>
<p><b>Safety</b></p> <p><i>Risks and hazards to safety of operations &amp; safety aspects on human health</i></p>	<p>There are no significant safety issues, apart from the mental health aspects.</p>
<p><b>Stakeholder engagement</b></p> <p><i>Stakeholder views on the investment proposal and other options to address the problem</i></p>	<p>There is widespread dissatisfaction with the current program. However, there is also not a universal view regarding the form that a new program should take, apart from removing the current disincentives and stigma associated with the current approach. A new program should encourage a partnership approach and producers taking responsibility for footrot control on their own properties.</p>

## 6.2 Who should be making this action and investment?

The current footrot program is funded by industry, and administered by PIRSA and Livestock SA. This report has not undertaken a detailed assessment of the need for government intervention so it is assumed that the arrangements for the current program would persist under any other footrot program proposed in this report.

## 6.3 What sort of action might be most worthwhile?

Stakeholder consultation undertaken for this report identified several options regarding the management of footrot in South Australia. These options have been refined into four feasible options that are outlined in section 6.3.2.

### 6.3.1 Defining the problem

The current program aims to *“to enhance the understanding, diagnosis and management of footrot in South Australia and reduce the number of footrot infected flocks, using a collaborative industry approach”*.

However, the problem with the current regulatory approach is that the stigma and fear of consequences (particularly in high prevalence areas) has led to significant under-reporting, which works contrary to the program aims. Hence, the current program is not fit for purpose and is not achieving its goals. For many, it provides a false sense of security. Further, there is not a broadly based culture within the industry to take individual responsibility for prevention of spread and on-farm management of footrot.

There is a general view across the industry that the program needs to change. However, there is not a common view regarding exactly what changes are required. A significant cohort, especially in the south-east, considers that the disease should be deregulated as has been done in Victoria. However, there are many who consider that full deregulation is a step too far.

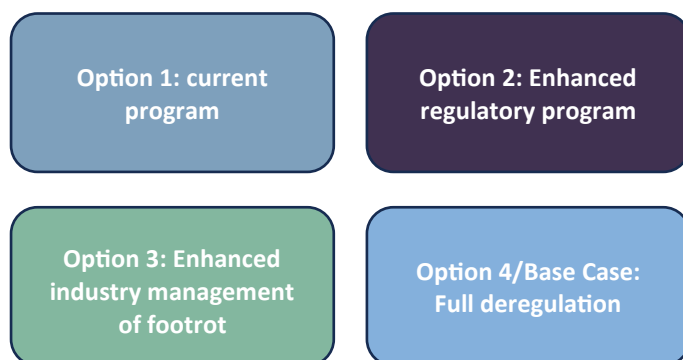
Given that footrot is very widely distributed as an endemic disease and that this is unlikely to change, it is suggested that the aim, rather than focussing on reducing the number of footrot infected flocks, should focus more on reducing the economic and animal welfare impacts of footrot more broadly within the industry. An alternative aim could be:

*To reduce the economic and animal welfare impacts of footrot across the South Australian sheep industry, by enhancing the understanding, diagnosis, prevention and management of footrot using a collaborative industry approach.*

### 6.3.2 Identify the options

This section outlines the feasible options that were identified through consultation and subject to analysis in this report. Note that the key features of each option are indicative only and should be subject to detailed co-design by industry and government. The diagram below identifies each option with further details on each option outlined below.

Figure 10 Summary of proposed options





### 6.3.2.1 Option 1 – Current program

#### Key Features:

- Program currently costs around \$900,000 p.a.
- Surveillance to identify footrot infected properties, primarily through awareness and owner reporting, as well as saleyards monitoring which is variable (abattoir surveillance does not occur).
- Provision of free diagnostic services through the program.
- Properties identified with virulent footrot subject to strict movement restrictions aimed at preventing spread to other properties.
- Infected properties required to either manage or eradicate footrot.
- General education and awareness, plus support for contractors and veterinarians.

Table 6-2 Summary of Option 1

<b>Implications for overall footrot management</b>	<b>Advantages</b>	<b>Disadvantages</b>
No change from current situation.	<ul style="list-style-type: none"> <li>• Supported by some sections of the sheep industry and provides a level of confidence regarding footrot risk management.</li> <li>• Prevents spread of footrot from known infected flocks.</li> <li>• Established history of footrot control and expertise within PIRSA.</li> <li>• Funding helps maintain PIRSA animal biosecurity capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• Widespread industry dissatisfaction with the program, particularly in high prevalence areas.</li> <li>• Surveillance component has low sensitivity of detection.</li> <li>• Fear of consequences has led to widespread under-reporting.</li> <li>• Actual prevalence unknown, but likely to be much higher than apparent prevalence (common view across stakeholders).</li> <li>• Producers with unreported footrot continue to trade and purchasers remain at risk.</li> <li>• Cost of eradication high and not all producers are capable.</li> <li>• Financial impact of detection largely borne by producers and affects some far more than others.</li> <li>• Emotional impact high for many under restrictions.</li> </ul>

### 6.3.2.2 Option 2 – Enhanced regulatory program

#### Key features:

- Program is likely to cost more than \$1 million p.a.
- Enhanced surveillance through abattoirs and saleyards to improve detection rates.
- Strengthened sheep trading declaration system in relation to footrot status.
- Other enhancements also possible to improve support for affected producers, subject to funding availability. See section 5.4 for possible enhancements.
- Additional resources to support the program.

Table 6-3 Summary of Option 2

Implications for overall footrot management	Advantages	Disadvantages
Some level of increased control of virulent footrot could be expected	<ul style="list-style-type: none"> <li>• Favoured by some sections of industry.</li> <li>• Improved surveillance would give the program more technical credibility.</li> <li>• <u>May</u> further reduce spread of footrot and reduce prevalence.</li> <li>• Depending on design, could provide more support to producers to control / eradicate.</li> </ul>	<ul style="list-style-type: none"> <li>• The program would be more costly.</li> <li>• Availability of on-ground resources to support.</li> <li>• Cooperation from abattoirs and saleyards required.</li> <li>• Surveillance information not captured for platforms such as AuctionsPlus which are increasingly being used.</li> <li>• Likely to be unpopular with most producers, agents and saleyards (particularly in high prevalence areas - more being caught – fear of consequences).</li> <li>• Increased distrust of PIRSA.</li> <li>• Increased avoidance behaviour likely, e.g., selling stock interstate.</li> <li>• Contrary to general national trend for management of endemic diseases (i.e., decreases focus on owner responsibility).</li> </ul>

### 6.3.2.3 Option 3 – Enhanced industry management of footrot.

#### Key features:

- Program is assumed to cost the same as Option 1, although could cost more depending on detailed design.
- Focus is on supporting producers to better manage virulent footrot.
- Formal government-industry partnership established for detailed program design and management.

- Enhanced education / awareness program focussing on identification, control methods, prevention strategies (with a focus on risk mitigation when purchasing stock).
- Enhanced support/education for technical specialists and for affected producers.
- Enhanced sheep trading declaration system in relation to footrot status (may depend on national agreement for changes to Sheep Health Statement).
- Illegal to sell clinically affected sheep at a saleyard or to another property without full disclosure (or a variation on this).
- Footrot remains notifiable<sup>19</sup> but no regulatory action taken following notification or detection unless there are significant animal welfare issues evident or marketing footrot infected sheep without disclosure.
- Supply of vaccine does not require CVO approval.
- Incentive(s) incorporated, for example, subsidy for first consultation with a recognised technical specialist following footrot diagnosis (could be an initial measure, but phased out over time).
- Other enhancements also possible to improve support for affected producers, subject to funding availability. See section 5.4 for possible enhancements.
- Possible R&D investment, especially improved vaccine technology.

Note – detail of the regulatory measures, in particular, should be subject to industry – government co-design.

Table 6-4 Summary of Option 3

<b>Implications for overall footrot management</b>	<b>Advantages</b>	<b>Disadvantages</b>
An overall improvement to levels of footrot control could be expected through better education & support for producers (overall prevalence may not change, but reduce impact per flock). However, it is difficult to quantify the degree to which the majority of producers will improve their	<ul style="list-style-type: none"> <li>• Supports development of a culture of producer responsibility and professionalism within the industry.</li> <li>• Increases producer individual responsibility for footrot control (traders and purchasers).</li> <li>• Greater focus on reducing economic and animal welfare impacts.</li> <li>• More consistent with interstate programs.</li> </ul>	<ul style="list-style-type: none"> <li>• Partial deregulation will be unpopular with some sections of industry.</li> <li>• Lack of formal trading restrictions for infected properties potentially leading to increased spread.</li> <li>• Possible continued lack of interest from producers generally to improve their own practices.</li> <li>• Current lack of technical resources to support producers and difficulty in enhancing this.</li> <li>• Impact on known true prevalence of footrot uncertain.</li> <li>• PIRSA staff will need to change their operating model (or alternatively transfer responsibilities to industry).</li> </ul>

<sup>19</sup> We note that footrot remains notifiable in Victoria, but in practice, notification rarely occurs and is at best, variably complied with in South Australia. This raises the question of whether notifiability is a practical legislative provision. An alternative approach when the new Biosecurity legislation is introduced may be to just have a provision associated with the General Biosecurity Duty whereby producers are expected to manage the more serious aspects of footrot (animal welfare and risks to other producers if not controlled).

practices. This is the primary risk under this option – poor take-up of the support that is made available.	<ul style="list-style-type: none"> <li>Removes / reduces stigma associated with footrot.</li> <li>Should be supported by majority of producers.</li> <li>Should lead to an overall, long-term improvement in the on-farm impact of footrot.</li> <li>More rewarding role for PIRSA staff.</li> <li>Improves EAD early detection if producers more likely to seek assistance.</li> </ul>	<ul style="list-style-type: none"> <li>Possible loss of core funding for PIRSA staff, leading to reduced capability overall.</li> <li>May be difficulties implementing with current legislation.</li> <li>Need to be careful that enforcement of remaining regulatory provisions doesn't create similar issues as the current program.</li> </ul>
---	---	---

#### 6.3.2.4 Option 4/ The Base Case – Full Deregulation.

##### Key features:

- Footrot deregulated. No longer notifiable (plus or minus regulations in relation to trading of diseased sheep – General Biosecurity Duty in new Biosecurity Act).
- Focus on owner responsibility for control and buyer beware (plus or minus published risk areas and mandatory health statement).
- General education and awareness regarding footrot, trading implications, risk mitigation etc.
- Supply of vaccine does not require CVO approval.
- Other enhancements possible to improve support for affected producers, subject to funding availability. See section 5.4 for possible enhancements.
- Possible R&D investment, especially improved vaccine technology.

Table 6-5 Summary of Option 4/The Base Case

Implications for overall footrot management	Advantages	Disadvantages
Anecdotal evidence from interstate (Victoria and Tasmania) is that there was little change when footrot was deregulated, although this is not quantified. Level of control on individual properties highly variable.	<ul style="list-style-type: none"> <li>Greater consistency with interstate programs.</li> <li>Removes stigma associated with footrot.</li> <li>Becomes producer responsibility.</li> <li>Supports increased professionalism within the industry.</li> <li>More opportunities for private sector to support industry.</li> </ul>	<ul style="list-style-type: none"> <li>Deregulation not favoured by significant proportion of industry.</li> <li>Producer responsibility – uncertain how many will take footrot seriously.</li> <li>Current lack of technical resources to support producers and difficulty in enhancing this.</li> <li>Lack of formal trading restrictions for infected properties.</li> <li>Unclear what will be the actual impact on true prevalence of footrot, although spread from known infected properties likely to increase.</li> </ul>

- 
- Reduced call on industry funds.
  - Regulatory action only possible for serious animal welfare cases.
  - Loss of core funding to maintain PIRSA field staff.
- 

For the purposes of the economic assessment, Option 4 (Full Deregulation) will be the Base Case against which all other options will be assessed.

### 6.3.3 Economic assessment using multi-criteria analysis

The purpose of the economic assessment was to help guide decision making on the preferred option using the available data and information through a transparent process. The economic assessment compared Option 1 – Current program, Option 2 – Enhanced regulatory program and Option 3 – Enhanced industry management against Option 4/ The Base Case - full deregulation.

A multi-criteria analysis (MCA) was selected as the best tool to undertake the assessment reflecting:

- The limited data available to quantify all relevant key costs and benefits
- Uncertainty regarding the prevalence of footrot in South Australia today, and how this might change under the various options over time
- The ability to incorporate factors such as incentives, risk and distributional considerations, which have been identified as key issues during consultation.

The proposed methodology is consistent with Tom Kompas and Shuang Liu’s report *Comparing multi-criteria analysis and cost benefit analysis for biosecurity*<sup>20</sup>.

#### 6.3.3.1 MCA framework

Options were assessed using the following MCA framework:

*Table 6-6 MCA framework*

Criteria	Weighting	Description
<b>Costs to industry and government</b>	1/3	The costs incurred by producers to manage footrot on their properties (including compliance with any regulatory regime).  The Government costs of any program to manage footrot, including any ongoing costs for education & support (including subsidies), laboratory diagnostics, compliance monitoring and enforcement.
<b>Benefits to industry</b>	1/3	The benefits of any program or activities undertaken to manage the prevalence and impact of footrot

---

<sup>20</sup> Kompas, T., & Liu, S. (2013, October). [Comparing multi-criteria analysis and cost benefit analysis for biosecurity](#)

<b>Equity considerations</b>	1/3	Assessing the distribution of costs and benefits across industry participants (i.e. is it fair) considering the risk creators and beneficiaries
------------------------------	-----	---

Options were scored relative to the Base Case (Full Deregulation) using a 5-point Likert scale as follows:

*Table 6-7 MCA scoring*

<b>Cost score</b>	<b>Scale</b>	<b>Benefit score</b>	<b>Scale</b>
<b>0</b>	No change relative to Base Case	<b>0</b>	No change relative to Base Case
<b>-1</b>	Insignificant incremental cost	<b>+1</b>	Insignificant incremental benefit
<b>-2</b>	Minor incremental cost	<b>+2</b>	Minor incremental benefit
<b>-3</b>	Moderate incremental cost	<b>+3</b>	Moderate incremental benefit
<b>-4</b>	Major incremental cost	<b>+4</b>	Major incremental benefit
<b>-5</b>	Significant incremental cost	<b>+5</b>	Significant incremental benefit

Once each criterion is scored for each of the options, the criteria are weighted in accordance with the MCA framework (1/3 each) and the weighted scores are totalled to determine a final weighted score. The preferred option is the option with the highest positive weighted score.

### **6.3.3.2 Limitations of the economic assessment**

The analysis undertaken in this report is inherently limited and subjective due to the lack of information available. It has been informed by the consultation, stakeholder engagement and research undertaken for this report; which represents a sample of views, opinions and facts as they relate to the prevalence and the management of footrot in South Australia. The analysis has been conducted using the available data and research, noting there is significant uncertainty regarding the prevalence of footrot in South Australia – a key variable in the analysis. There are also differing opinions on the effectiveness of the current footrot program, which means subjective judgement had to be used to score options. Given that scoring is subjective, the scoring in this report (and by implication preferred option it generates) is reflective of the views of the authors of this report, and may differ from those in industry and/or government.

### 6.3.3.3 Economic assessment

#### Criterion 1: Costs to industry and government

The table below presents a summary of the key considerations for scoring the options against Criterion 1-costs with detailed discussion presented thereafter.

Table 6-8 Criterion 1 – Costs to industry and government: Key considerations for MCA scores

Option	Key considerations	Cost score
<b>Option 1 – Current program</b>	<ul style="list-style-type: none"> <li>Prevalence of footrot assumed same across options, at least initially</li> <li>Program costs of around \$900,000 p.a. relative to Base Case</li> <li>Net effect on costs to avoid footrot incursions is a small cost saving relative to the Base Case and Option 3.</li> <li>Significantly higher costs to control/eradicate footrot relative to the Base Case because problem is hidden rather than addressed and eradication may not be successful</li> </ul>	<p><b>-4</b></p> <p>Major incremental cost</p>
<b>Option 2 – Enhanced regulatory program</b>	<ul style="list-style-type: none"> <li>Prevalence of footrot assumed same across options, at least initially</li> <li>Program costs probably of more than \$1 million p.a. relative to Base Case</li> <li>Net effect on costs to avoid footrot incursions is a small cost saving relative to the Base Case and Option is a small cost saving on costs to avoid footrot incursion relative to Option 3 and the Base Case</li> <li>Significantly higher costs to control/eradicate footrot relative to the Base Case because problem is hidden rather than addressed</li> </ul>	<p><b>-5</b></p> <p>Significant incremental cost</p>
<b>Option 3 – Enhanced industry management</b>	<ul style="list-style-type: none"> <li>Prevalence of footrot assumed same across options, at least initially. Within flock prevalence reduced overall on average over time.</li> <li>Program costs of around \$900,000 p.a. relative to the Base Case</li> <li>Same as the Base Case on costs to avoid footrot incursion</li> <li>Slightly lower costs to control footrot relative to the Base Case because program resources guide more efficient use of funds to manage the disease</li> </ul>	<p><b>-2</b></p> <p>Minor incremental cost</p>
<b>Option 4/The Base Case – full deregulation</b>	<ul style="list-style-type: none"> <li>Prevalence of footrot assumed same across options</li> <li>Program costs \$0 p.a. relative to the Base Case</li> <li>Base Case costs to avoid footrot incursion include high search costs to detect possible footrot, and larger investments in on-farm footrot control practices</li> <li>Base Case costs to control footrot are high but still lower than the cost of eradication under Options 1 and 2.</li> </ul>	<p><b>0</b></p> <p>No change from the Base Case</p>

## Key considerations discussion

### Prevalence of footrot

The prevalence of footrot under each option is a key consideration that drives both the costs and benefits of each option. There is a high level of uncertainty and disagreement regarding the prevalence of footrot currently in South Australia in part because it varies based on geographic location, the host, and climatic conditions (particularly warm wet conditions). In 2008 PIRSA undertook a survey to estimate the presence of footrot in South Australia which found:

*Of the 80 properties surveyed, virulent footrot was found in five flocks, resulting in a prevalence of 6.25%<sup>21</sup>. Four of these properties were in the South East. Benign footrot was found in 20 flocks resulting in a prevalence of 25 per cent. Eleven of these flocks were in the South East.<sup>22</sup>*

The above estimate, even without taking into account under-reporting, is an under-estimate, as the prevalence was not adjusted for the known infected flocks. Stakeholder engagement undertaken for this report, indicates that footrot is under-reported due to unintended consequences of the regulatory program. Furthermore, 55% of survey respondents in this report indicated that they did not think the current Footrot program was achieving its aims to control the disease.

Stakeholders from other jurisdictions that have deregulated footrot (like Victoria) report that the prevalence of footrot remained largely the same following deregulation, but the culture had changed (e.g., no more stigma associated with footrot).

For the purposes of this report, it is assumed that the prevalence of footrot (in terms of the percentage of flocks infected) remains largely unchanged across the options. However, in theory, Option 3 where there is better education and support for producers to control footrot plus a removal of the main driver of non-reporting, should result in overall better control within sheep flocks and reduced disease impact on the industry. While investments in a regulatory footrot program aimed at eradicating the disease might be perceived to reduce its prevalence, lack of reporting which reduces the effectiveness of movement controls, coupled with a false sense of security mean that the disease remains well established in South Australia. We note that in WA this limitation has been largely overcome through intensive abattoir monitoring. However, in the past abattoir monitoring was found to be not as efficient under South Australian conditions.

### Cost of the program

The current Footrot program (Option 1) costs around \$900,000 p.a. and it is expected that Option 2's enhanced regulatory program would cost in excess of \$1 million. Option 3's enhanced industry management is assumed to match the current \$900,000 spend but the funds are geared more towards supporting farmers in recognising, understanding and managing footrot on their farms as opposed to undertaking compliance monitoring and enforcement activities. It is noted that there are likely additional costs to government as

---

<sup>21</sup> This was not adjusted to take into account the known, infected flocks that were not included in the survey.

<sup>22</sup> PIRSA. (2008). South Australian Footrot Survey Results



stakeholder consultation indicated that not all staff time spent on footrot was accounted for within the program.

Overall, Option 1's current program and Option 3's partially deregulated program cost around \$900,000 more relative to the Base Case while Option 2's enhanced regulatory program costs at least \$1 million more than the Base Case.

#### Costs to avoid footrot incursion

This section considers the cost incurred by industry to detect and avoid footrot incursions on farm e.g., through maintaining fences, search costs to detect footrot, on-farm biosecurity controls. It also considers the direct cost of the regulatory system that are designed to avoid footrot incursions like reporting suspected/infected sheep to PIRSA, adhering to movement controls and completing National Sheep Health Declaration (NSHD) for all movements of sheep which indicate the presence of footrot. A brief summary of the regulatory controls currently in place in South Australia is outlined below.<sup>23</sup>

- Sheep infected or suspected of being infected with any form of footrot must not be moved within or into the state without Chief Inspector of Stock (CIS) permission.
- Interstate sheep infected or suspected of being infected with any form of footrot are not permitted to enter South Australia without CIS permission
- A NSHD must be completed for all movements of sheep within and into South Australia declaring all forms of footrot; both benign and virulent.

Under the Base Case (Full deregulation), it is assumed that moderate costs are incurred to avoid footrot outbreaks to the extent that they make commercial sense. Here farmers might invest in boundary fences, use footbaths, and flip sheep to inspect them for footrot as they see fit knowing that avoiding the disease means avoiding the cost of managing the disease. There would however be no movement controls (except possibly movement controls imposed by other states), no reporting (and subsequent eradication) efforts to remove footrot and there wouldn't be any declarations. This means the market would strictly operate on a 'buyer beware' basis.

Under Option 1 (current program) and Option 2's regulatory programs, industry is assumed to incur somewhat lower costs (relative to the Base Case) for on-farm biosecurity and investments in boundary fences to avoid footrot incursions. This is because footrot is a notifiable disease, so the perception is that farmers are 'protected' and therefore justify spending less to avoid footrot (e.g., rely on NSHDs rather than spend time flipping sheep to inspect for footrot). In essence, the regulatory framework provides farmers a false sense of security, reducing incentives to invest in protection to avoid footrot incursions.

Additionally, Option 1 and 2's regulatory programs also come with additional compliance costs for farmers like time spent reporting suspected footrot to PIRSA, and time spent completing NSHDs every time stock is moved within or into South Australia. These are additional regulatory costs, which add up over time. For instance, if every sheep farmer

---

<sup>23</sup> Department of Primary Industries and Regions. (2023, November). [Footrot](#)

(5,200 across the state<sup>24</sup>) completed 15<sup>25</sup> NSHDs every year and it took 5 minutes for each farmer to complete the form, this is a regulatory burden of roughly \$230,000 p.a. using \$35.29 per hour as the opportunity cost of their time.<sup>26</sup>

Research undertaken in this report suggests that in practice these NSHDs are sometimes completed by agents rather than farmers. Agents aren't incentivised to make honest disclosures around the sheep as they earn sales-based commission and are unlikely to have the skills required to diagnose footrot (especially if it is a mild strain in the dry season). However, they should make due enquiry with the owner. As such, while there are regulatory controls (and associated costs) to minimise the spread of footrot, they aren't always effective in achieving the desired outcome (see benefits section for more information).

Overall, the Base Case (full deregulation) and Option 3's partial deregulation are expected to encourage higher investments in search costs to detect possible footrot, and larger investments in on-farm biosecurity practices (including boundary fences, treatment of introduced sheep and quarantine paddocks)<sup>27</sup> relative to Options 1 and 2 over time. Options 1 and 2 however also incur additional costs to comply with regulatory controls to minimise the risk of footrot incursions. Given investments in on-farm biosecurity are often more significant than the additional admin costs associated with Options 1 and 2, it is assumed there is a small cost saving under the regulatory options relative to the Base Case and Option 3.

#### Compliance costs to control and/or eradicate footrot

This section considers the cost incurred by industry to control or manage footrot incursions should they occur. It includes the costs to comply with the regulatory requirements pertaining to footrot being a notifiable disease and the regulatory controls instilled to control or eradicate the disease. Under the current regulatory program, the eradication of footrot from a property is not mandatory, however it is often seen that way (as noted in section 5.3). A brief summary of the current regulatory program's approach to controlling or eradicating footrot in South Australia is outlined below.<sup>28</sup>

---

<sup>24</sup> Livestock SA, [The South Australian Sheep Industry Blueprint 2030](#)

<sup>25</sup> Livestock SA estimates between 10 and 20 NSHDs p.a., based on industry experience. The analysis has assumed the midpoint of 15 per farmer, per annum.

<sup>26</sup> ABS. (2024, January). [63060DO11\\_202305 Employee Earnings and Hours, Australia, May 2023](#). This source indicates that the average weekly earnings for livestock farmers (best matching category) in Australia was \$1,341.70 which assuming a standard 38 hour working week amounts to an equivalent hourly rate of \$35.29

<sup>27</sup> Shepard, R. et al., (2022). [Priority list of endemic diseases for the red meat industry — 2022 update](#) noted a cost of \$0.23 per sheep for maintaining boundary fences noting only a portion of this cost can be attributed specifically to footrot. Assuming roughly 10.7 million sheep in South Australia (Livestock SA, [The South Australian Sheep Industry Blueprint 2030](#)), the cost of maintaining boundary fences is in the order of \$2.45 million p.a. (or roughly 10 times that of completing NSHDs) noting only a portion of this expense can be attributed directly to footrot.

<sup>28</sup> Department of Primary Industries and Regions. (2022, September). [Eradicating Footrot](#)

- Sheep infected or suspected of being infected with any form of footrot must not be moved within or into the state without Chief Inspector of Stock (CIS) permission.
- Footrot diagnoses should be confirmed via either a clinical diagnosis or a laboratory diagnosis
- To control footrot, farmers must use a combination of destocking infected sheep, footbathing infected sheep, and consider vaccinations (noting these only offer short term protection)
- To eradicate footrot all infected sheep must be removed, footrot bacteria killed and remaining sheep need to be free from disease. This may be achievable by destocking all infected sheep, quarantining the flock, undertaking hoof paring, footbaths and antibiotic treatment. Extensive monitoring is required to verify successful eradication.

The first cost incurred is the cost to formally diagnose footrot whether through a clinical diagnosis or via a laboratory diagnoses. Both require inspection of a significant number of sheep to get a representative sample of the flock. Given the prevalence of footrot is assumed to be the same across the options, costs associated with diagnosing footrot are assumed to be rather similar across the options.

Following a confirmed footrot incursion, farmers incur costs to either manage or eradicate footrot depending on the extent of the outbreak and the option. In the regulated options, it is assumed most farmers aim to eradicate footrot given it is a notifiable disease (albeit some regions like the South-East of South Australia may opt to control it as eradication is more challenging), whilst under Option 3 and the Base Case (Full deregulation) farmers are expected to manage the disease rather than eradicate it (however, they can eradicate it if they chose to try to).

Data from a study undertaken by Shephard et al., in 2022 provides some indication of the costs involved in controlling or eradicating footrot:

- \$0.17 per sheep, per bath with approximately 2 baths p.a. for 50% of sheep with benign footrot, 4 baths p.a. for sheep with intermediate footrot and 5 baths p.a. for sheep with virulent footrot. An additional 3.8% of farmers were assumed to footbath any introduced sheep.
- \$2.58 per sheep for antibiotic treatment for 5% of sheep with intermediate footrot and 10% of sheep with virulent footrot
- \$2.20 per sheep for vaccinations administered to roughly 25% of sheep with virulent footrot
- \$5.10 per sheep for 3 inspections plus \$2.58 per sheep for antibiotic treatment to eradicate.<sup>29</sup>

These costs are significant, and as expected increase substantially when moving from controlling footrot (through footbaths and occasional treatment) to eradicating footrot, which may or may not be successful. Considering the prevalence of footrot is assumed to

---

<sup>29</sup> Shepard, R. et al., (2022). [Priority list of endemic diseases for the red meat industry — 2022 update](#)

remain constant across the options, the decision to control/manage footrot versus eradicate it drives cost differences between the options. Under regulatory Option 1 and 2 it is assumed that a greater proportion of farmers will attempt to eradicate the disease (because many farmers see this as mandatory even though it isn't) whereas under the deregulated Options 3 and the Base Case (full deregulation) more targeted control measures can be pursued instead.

In addition to the direct costs of eradication, there are also indirect revenue implications. The eradication of stock results in forgone revenue from the sale of sheep meat and wool products that otherwise could have been realised had footrot been controlled and the stock retained. There are also replacement costs associated with replenishing stock that is destroyed in an effort to eradicate the disease, which would not be incurred if the stock is retained and footrot is controlled/managed rather than eradicated.

Another indirect cost of a footrot incursion under Options 1 and 2's regulatory program is the restrictions it places on sales whereby producers with diagnosed footrot incursions can only sell stock to abattoirs or feedlots for fattening. As such, Option 3 and the Base Case should also provide more flexible trading options (with full disclosure) for producers with an infected, but well controlled, flock.

As such, the costs of controlling and/or eradicating footrot are presumably higher in Options 1 and 2 relative to Option 3 and the Base Case (full deregulation). Additionally, the investments in educational resources/campaigns under Option 3 help farmers recognise and effectively manage footrot would reduce these costs marginally relative to the Base Case because footrot is able to be detected earlier, treated faster and more efficiently.

## Criterion 2: Benefits to industry and government

Table 6-9 Criterion 2 – Benefits to industry: Key considerations for MCA scores

Option	Key considerations	Benefit score
<b>Option 1 – Current program</b>	<ul style="list-style-type: none"> <li>Several reasons why benefit realisation has been constrained under the current program</li> <li>Poor industry incentives and culture surrounding footrot because of the stigma and a fear of consequences should footrot be detected</li> <li>Delays in recognising footrot incursions, and unreported incursions are expected to result in production impacts that are similar to those under the Base Case, however the perception that footrot must be eradicated under regulatory programs means these production impacts are short lived if eradication is successful where footrot is found. Overall, a minor improvement relative to Base Case</li> <li>Minor improvements in animal welfare compared to the Base Case citing similar rationale to that for production impacts</li> </ul>	<b>+2</b> Minor incremental benefit
<b>Option 2 – Enhanced regulatory program</b>	<ul style="list-style-type: none"> <li>Several reasons why benefit realisation as per Option 1 – with similar outcomes expected in other regulatory programs</li> </ul>	<b>+2</b>

	<ul style="list-style-type: none"> <li>• Poor industry incentives and culture surrounding footrot because of the stigma and a fear of consequences should footrot be detected (similar to Option 1)</li> <li>• Production impacts are similar to Option 1 with an overall minor improvement relative to Base Case</li> <li>• Minor improvements in animal welfare compared to the Base Case citing similar rationale to that for production impacts</li> </ul>	Minor incremental benefit
<b>Option 3 – Enhanced industry management</b>	<ul style="list-style-type: none"> <li>• Like the Base Case, it improves industry culture and incentives surrounding footrot diagnoses and management relative to Options 1 and 2.</li> <li>• Significant improvement in industry incentives and culture surrounding footrot (better than Base Case). Investment in tools to upskill farmers in recognising and responding to footrot, and access to professional advice on footrot (vets, PIRSA staff etc.) enables a culture of knowledge sharing on the most efficient ways in which to manage the disease, which isn't expected under the Base Case where this investment in education doesn't occur.</li> <li>• Production impacts are moderately improved relative to the Base Case because farmers are upskilled to better recognising and responding to footrot, and knowledge is shared on the most efficient ways in which to manage the disease</li> <li>• Moderate improvements in animal welfare compared to the Base Case citing similar rationale to that for production impacts</li> </ul>	<b>+3</b> Moderate incremental benefit
<b>Option 4/The Base Case – full deregulation</b>	<ul style="list-style-type: none"> <li>• Improvement in industry incentives and culture surrounding footrot (relative to Option 1 and 2) because deregulation removes the stigma, reduces fear of consequences and creates more transparency on the prevalence of footrot.</li> <li>• Production impacts are presumably quite high because while most farmers take appropriate precautions to minimise the risk an incursion, but not all farmers have sufficient knowledge and skills to recognise and efficiently respond to footrot incursions and some can ignore the problem.</li> <li>• Animal welfare impacts can be improved through better management of the disease.</li> </ul>	<b>0</b> No change from the Base Case

## Key considerations discussion

### Factors impacting benefit realisation

The application of regulatory controls in Options 1 and 2 are designed to (in theory) minimise the prevalence and impact of footrot on South Australia's sheep industry. This section outlines a range of factors that have shaped the extent to which benefits of the current regulatory program have been achieved or realised based on the key issues identified in this report. The table below summarises issues identified in this report and their impact on benefit realisation for regulated footrot programs outlined in Options 1 and 2 of this report.

Table 6-10 Benefit realisation considerations

Summary of key issues (details in section 5.3)	Impact on benefit realisation for regulated footrot programs
<ul style="list-style-type: none"> <li>• Social stigma associated with footrot</li> <li>• Some farmers are anecdotally slow to react to footrot incursion</li> <li>• Fear of consequences if detected</li> <li>• Some even fear reporting footrot to their vet</li> </ul>	<ul style="list-style-type: none"> <li>• Lower detection and more likely to deny footrot out of fear of consequences and social stigma</li> <li>• Later detection could mean it's more challenging (and costly) to control/eradicate</li> <li>• Lack of veterinary input might result in inefficient investments on controls/eradication efforts which do not materially improve footrot prevalence and/or severity</li> </ul>
<ul style="list-style-type: none"> <li>• Program generally doesn't suppress the prevalence of footrot</li> <li>• Factors above means footrot is generally under-reported which is counter productive</li> </ul>	<ul style="list-style-type: none"> <li>• Production impacts aren't significantly different between regulated and deregulated options because the prevalence of footrot is largely the same</li> </ul>
<ul style="list-style-type: none"> <li>• Generally, a false sense of security that footrot is under control</li> <li>• The program is perceived as 'a government thing' and doesn't incentivise farmers to take responsibility for biosecurity risks on their own farms</li> <li>• Only some farmers actually inspect sheep for footrot before purchasing them</li> </ul>	<ul style="list-style-type: none"> <li>• False sense of security incentivises lower investments in search costs to detect footrot (e.g., inspect sheep), and lower investments in on-farm biosecurity practices to avoid a footrot incursions (e.g., maintaining boundary fences and quarantining introduced sheep)</li> </ul>
<ul style="list-style-type: none"> <li>• Program is complex and difficult to understand</li> </ul>	<ul style="list-style-type: none"> <li>• Program is not well understood leading to lower compliance</li> </ul>

In summary, this report has identified several issues which constrain the extent to which benefits have been realised for South Australia's current regulatory footrot program. Furthermore, it is assumed that similar issues would persist under Option 2's more stringent regulatory program.

### Industry incentives and culture

This section outlines the industry incentives and biosecurity culture that is encouraged by each of the options. It explores some of the unintended consequences that have been observed as a result of a regulatory footrot program including:

- Incentivises lower diagnostic testing to detect footrot, because there are consequences if it is detected.
- Delays diagnostic testing because of the false sense of security generated by a regulatory program (e.g., might attribute lameness to other suspected conditions because the perception is that footrot is under control in South Australia). Later detection could mean it's more challenging (and costly) to control/eradicate.
- Discourages farmers from seeking professional advice and assistance from industry professionals like vets because this means their property would be

managed by PIRSA to control the disease. Without professional advice, farmers might make inefficient investments on controls/eradication techniques which do not materially improve footrot prevalence and/or severity.

- Discourages farmers from obtaining the necessary skills and knowledge to recognise and respond to footrot incursions should they occur.
- The program is seen a ‘government thing’ which inadvertently transfers the risk of a footrot incursion to government and subsequently discourages individual ownership biosecurity risks on individual farms.

While deregulation comes with its own set of incentives and consequences, overall the authors of this report are of the opinion that deregulating footrot in South Australia (under Option 3 and the Base Case), would foster a better understanding of footrot, a more supportive culture in managing footrot incursions and establish better incentives for farmers to take individual responsibility for the ownership of their biosecurity risks. In doing so, footrot would approach like other established livestock diseases.

This opinion aligns with feedback received through stakeholder engagement undertaken to inform this report. It is also echoed by authors like Best et al., who found that:

*Due to this fear of stigmatization, those affected often deal with the disease [footrot] inhouse, carrying out an often inaccurate self-diagnosis and treatment of the flock, without engaging a professional such as a veterinarian or footrot contractor, as official diagnosis can be undesirable in terms of both legislation and negative labeling in the community. This negative labeling is helped by the wording and legislation surrounding footrot. The image of being under “disease control legislation,” which is designed to protect the wider industry and improve animal welfare, still implies that an individual is being managed by the state, requiring governmental “intervention” or perhaps even that he or she has broken the law or done something wrong, rather than it being an unfortunate circumstance.<sup>30</sup>*

Overall, the Base Case (full deregulation) and Option 3 are expected to improve industry culture and incentives surrounding footrot diagnoses and management relative to Option 1 and 2’s regulatory programs because deregulation removes the stigma, reduces fear of consequences and creates more transparency on the prevalence of footrot. Additionally, Option 3’s investment in tools to upskill farmers in recognising and responding to footrot, and access to professional advice on footrot (vets, PIRSA staff etc.) enables a culture of knowledge sharing on the most efficient ways in which to manage the disease, which isn’t expected to the same degree, under the Base Case.

---

<sup>30</sup> Best, N., Menéndez, R., Rawlin, G., Suter, R., Rodoni, B., Beddoe1, T. The Consequences of Stigma for Knowledge Production: Sheep Producers’ Attitudes to Footrot Diagnostics and Control in Australia. *Frontiers in Veterinary Science* (2020) 7: 354. doi: 10.3389/fvets.2020.00354

## Production impacts

This section outlines the impact of footrot on production including through:

- *Weight gain of sheep* – infected sheep experience inappetence reducing weight gain. Sheppard et al., found that benign footrot reduces body mass by 0.5% and 2.5% for virulent footrot<sup>31</sup> which reduces revenue from the sale of sheep meat.
- *Ewe fertility* – infected sheep are lame which reduces the chances of successful fertility reducing the size of the flock, and by implication reduces the production of sheep meat and wool available to supply to the market. Sheppard et al., notes that ewe fertility is reduced by 1.5% for every kilogram of body mass lost due to the disease.<sup>32</sup>
- *Wool growth* – infected sheep produce finer wool, which in turn reduces the fleece weight and subsequent revenue derived from the sale of wool. Sheppard et al., suggests fleece weight declines by 0.5% for sheep with benign footrot and 3% for sheep with virulent footrot.<sup>33</sup>
- *Discounted prices* – In addition to the reduction in the quantity of sheep meat and wool products produced by infected sheep, there is also evidence of a price discount of roughly \$10 per sheep if footrot is detected.
- *Sheep mortalities* – These are sheep that die as a direct result of untreated and severe cases of virulent footrot with a suggested mortality rate of around 4.5%.<sup>34</sup>

It is also important to note that despite the specificity suggested by Sheppard et al., the production impacts of footrot are not always apparent, nor is there consensus on their magnitude. Greer, G. for instance found that:

*Although the costs of footrot prevention and control are comparatively easy for farmers to estimate, estimating production losses is much more difficult in a dynamic farming system where a range of environmental and management conditions affect farm production levels. Many of the farmers surveyed did not identify specific production losses, but noted that they believed that production was affected although they were unable to quantify losses.*<sup>35</sup>

Greer, G. concluded that the average value of production losses across all dominantly merino farms affected was estimated to be \$0.99 per head (in FY05)<sup>36</sup> or \$1.44 per head (in FY24)<sup>37</sup> noting that Merino sheep are more susceptible to infection.

Similarly, Buller et al., found that:

*Sheep with severe footrot lesions show inappetence, which leads to a reduced rate of wool growth; reduced body weight and reduced wool growth are directly related to the severity of lesions and number of feet infected.*<sup>36-38</sup> The annual mortality rate of

---

<sup>31</sup> Shepard, R. et al., (2022). [Priority list of endemic diseases for the red meat industry — 2022 update](#)

<sup>32</sup> Shepard, R. et al., (2022). [Priority list of endemic diseases for the red meat industry — 2022 update](#)

<sup>33</sup> Shepard, R. et al., (2022). [Priority list of endemic diseases for the red meat industry — 2022 update](#)

<sup>34</sup> Buller, N.. & Eamens, G. (2014, May). [Ovine Footrot - Australian and New Zealand Standard Diagnostic Procedure](#)

<sup>35</sup> Greer, G. (2005). [The Costs of Footrot and the Impact of the Footrot Gene-Market Test in New Zealand.](#)

<sup>36</sup> Greer, G. (2005). [The Costs of Footrot and the Impact of the Footrot Gene-Market Test in New Zealand.](#)

<sup>37</sup> Assuming an average inflation rate of 2% p.a. between 2005 and 2024.



*sheep with severe footrot may be up to 4.5%. In contrast, mild lesions have minimal effect on production.*<sup>38</sup>

Australia Wool Innovation Limited suggest:

*Lambing percentages and fleece weights are estimated to be reduced by 10% in sheep with at least one severely affected foot. The greater the severity of footrot in a flock, the greater the impact on productivity and profitability.*<sup>39</sup>

Collectively this research indicates production impacts are dependent on two key factors:

1. the prevalence of footrot (e.g., more footrot, larger production impacts)
2. the severity of footrot with more significant production impacts associated with virulent footrot compared to benign footrot.

This analysis assumes that the prevalence of footrot is the same across all options meaning that these production impacts are present in some capacity across all options.<sup>40</sup> This in turn means that the severity of footrot is therefore the key driver of incremental production effects across the options. Buller et al., note that “*The clinical disease manifests as foot lesions that range in severity, depending on the virulence of the [bacterial] strain present, environmental conditions at the time and breed of sheep.*”<sup>41</sup> While these factors are all the same across options, other factors influencing the severity of the hoof lesions is the speed and effectiveness of interventions (e.g., antibiotic treatment, footbaths) administered to control the disease.

Under the Base Case, farmers take full responsibility for the risk of a footrot incursion as they aren't afforded any protections from a regulatory program. Here it is assumed that most farmers recognise the potential production impacts of footrot incursions, and take appropriate precautions to minimise the risk an incursion. However, not all farmers have sufficient knowledge and skills to recognise and efficiently respond to footrot incursions, and a minority will not respond effectively, hence production impacts are presumably relatively quite high.

Option 1 and 2's regulatory models conversely do not encourage regular and timely monitoring of sheep for possible footrot incursions because there is a false sense of security generated by the regulatory controls and farmers fear the stigma and consequences of an incursion. As such, farmers are likely slower to act to diagnose footrot; slower to subsequently treat the hoof lesions, allowing them to become more severe than would be the case with earlier intervention. Additionally, even once a footrot diagnosis is made, there appears to be a reluctance amongst farmers to engage expert knowledge (e.g., vets) to help them effectively manage the disease. This delay in recognising footrot incursions is expected to result in production impacts that are equally as high as those under the Base Case. However, the perception that footrot must be eradicated under regulatory programs means

---

<sup>38</sup> Buller, N. & Eamens, G. (2014, May). [Ovine Footrot - Australian and New Zealand Standard Diagnostic Procedure](#)

<sup>39</sup> Australia Wool Innovation Limited. (2020). [Footrot A guide to identification and control in the field.](#)

<sup>40</sup> This may seem counter-intuitive given the objective of a regulatory footrot program, but this assumption is consistent with the themes identified in section 5.3 of this report (i.e., that the current program generally doesn't suppress the prevalence of footrot).

<sup>41</sup> Buller, N. & Eamens, G. (2014, May). [Ovine Footrot - Australian and New Zealand Standard Diagnostic Procedure](#)

these production impacts are short lived if eradication is successful. Overall, Option 1 and 2's production impact are assumed to be a minor improvement on those experienced under the Base Case because eradication (if successful) limits their duration.

Option 3 however is similar to the Base Case and encourages farmers to recognise the potential production impacts of footrot incursions, and take appropriate precautions to minimise the risk an incursion. Option 3 however is expected to minimise production impacts even further than the Base Case because:

- It makes a significant investment in tools and resources to upskill farmers enabling them to effectively recognise and respond to footrot
- It enhances access to professional advice on footrot (vets, PIRSA staff etc.) meaning the most appropriate treatment is implemented to minimise severity of foot lesions
- It fosters a culture of knowledge sharing on the most efficient ways in which to manage the disease.

Overall, we expect Options 1 and 2 to have minor improvements to production impacts of footrot relative to the Base case because the primary response is to eradicate the disease minimising the duration in which production effects are realised. Option 3 however gives farmers the best tools to recognise and respond to footrot minimising production impacts to a moderate level relative to the Base Case.

#### Animal welfare

This section outlines the effects of footrot management on animal welfare outcomes.

Australia Wool Innovation Limited note:

*Footrot can be a major animal welfare issue for sheep. Infection and erosion of the sensitive tissue in the feet can cause extreme pain, and in severe cases the hard horn of the hoof may slough off.*<sup>42</sup>

Similar to production impacts, animal welfare outcomes are improved if there are quick and effective interventions to reduce the severity of hoof lesions. As such, for the same reasons as those articulated above, we would expect a minor improvement in animal welfare under Options 1 and 2 relative to the Base Case because whilst farmers may not detect footrot incursions as quickly, they are likely to be resolved faster than under the Base Case. This echoes some of the views expressed in the survey<sup>43</sup> undertaken for this report, which are articulated below:

*Fear of being reported stops people from seeking solutions and that leads to poor animal welfare outcomes!*

*If was unregulated and vaccine was available people will be more likely to use and improve animal welfare without being put under quarantine.*

*Because it doesn't improve animal welfare, it doesn't reduce economic impacts and it doesn't support producers*

---

<sup>42</sup> Australia Wool Innovation Limited. (2020). [Footrot A guide to identification and control in the field.](#)

<sup>43</sup> Note there were also views expressing concerns that deregulation would have significantly adverse animal welfare implications in part because infected animals would not be eradicated

*Farmers are reluctant to seek veterinary assistance because they do not want to become declared. Instead they are self medicating which is decreasing the animal welfare outcomes and increasing the spread*

Option 3 is expected to generate a moderate improvement compared to the Base Case as farmers have the tools to recognise and respond to footrot in the most efficient way.

### Criterion 3: Equity considerations

Table 6-11 Criterion 3 – Equity considerations: Key considerations for MCA scores

Option	Key considerations	Equity score
<b>Option 1 – Current program</b>	<ul style="list-style-type: none"> <li>Only some farmers take ownership of their biosecurity risks</li> <li>Those in areas of high prevalence, and/or particular farming types, e.g. studs, bear a disproportionately large burden which benefits industry collectively</li> </ul>	-3 Moderately negative impact
<b>Option 2 – Enhanced regulatory program</b>	<ul style="list-style-type: none"> <li>Same as Option 1</li> </ul>	-3 Moderately negative impact
<b>Option 3 – Enhanced industry management</b>	<ul style="list-style-type: none"> <li>Each farmer takes ownership of their full biosecurity risks</li> <li>Good collective industry action on footrot</li> </ul>	+3 Moderately positive impact
<b>Option 4/The Base Case – full deregulation</b>	<ul style="list-style-type: none"> <li>Each farmer takes ownership of their full biosecurity risks</li> <li>No collective industry action on footrot</li> </ul>	0 No change from Base Case

This section outlines the equity considerations associated with each of the options i.e., which segments of industry carry the burden, who benefits from those activities to control/eradicate footrot and is the system ‘fair’.

When it comes to footrot, all sheep farmers are risk creators<sup>44</sup> who interact with risk vectors (things like sheep, farm equipment, PPE, soil etc.,) which enable the disease to spread. Live sheep are the most important risk vector enabling the disease to spread between farms. Each farmer through their business activities creates a risk of footrot spreading across the state. Whenever one farmer undertakes some intervention to control or eradicate footrot, they generate benefits not only for themselves but for the industry as a whole by reducing the spread of the disease. This inherently creates an environment that incentivises ‘free-

<sup>44</sup> Noting that other industry participants may also be risk creators like saleyards, abattoirs, transport companies etc. but these are out of scope for the purposes of this analysis.

riders' where some industry participants benefit from investments in footrot controls undertaken by others and they themselves underinvest or don't invest at all in footrot controls. Equity considerations look at 'how fair' the options are by comparing those that make investments to control/eradicate footrot versus those that benefit from those interventions.

The research conducted in this report illustrates a clear theme of certain geographical segments of the industry (where footrot is more prevalent in part due to climate) having to make significant investments to control/eradicate footrot. Their private investments suppress the prevalence of footrot in other parts of the state allowing other industry participants to reduce their costs on activities to avoid footrot incursions. This is not an equitable outcome as it results in a disproportionately large burden being absorbed by certain segments of the industry for the benefit of the entire industry.

The current program also discourages some segments of industry from taking full ownership of their biosecurity risks when it comes to reducing the spread of footrot. This too creates equity concerns where there is a disproportionately higher burden on industry participants that do take ownership of their biosecurity risks. Together, these two factors result in moderately worse equity outcomes compared to the Base Case where all industry participants take individual ownership of their biosecurity risks.

Option 3 is expected to result in similar outcomes to the Base Case where most industry participants make investments in activities to avoid footrot incursions onto their properties, and make prompt targeted action to control footrot should an incursion occur. Option 3's program however also brings collective industry action to the problem of footrot through things like establishing a culture of knowledge sharing and greater transparency surrounding its prevalence. This collaborative approach results in footrot being seen as an industry wide problem where not only does everyone take ownership of their own biosecurity risks, but further investments are collectively made by industry to reduce the spread of the disease and minimise its impact on industry collectively. This collaborative approach is achievable because there is still a collective footrot program; noting that the focus of the program has shifted from compliance monitoring and enforcement (in Options 1 and 2) to tools to empower farmers in Option 3. As such, there is a moderate improvement in equity considerations under Option 3 relative to the Base Case.

#### **6.3.3.4 Results of economic assessment**

The table below combines the MCA scores across the three criteria, weights<sup>45</sup> them according to the MCA framework and generates a final weighted score for each option. Scores that are positive indicate better outcomes relative to the Base Case and vice versa. In this analysis, Option 3 is the preferred option with the highest positive final weighted score<sup>46</sup>.

---

<sup>45</sup> Cost criterion 1/3 weighting, benefit criterion 1/3 weighting and equity criterion 1/3 weighting.

<sup>46</sup> It's worth noting that if one was to reduce the weighting on the equity criterion making it less important, or even excluding it altogether, Option 3 would remain the preferred option.

Table 6-12 MCA results: final weighted scores

Option	Unweighted score: Costs criterion	Unweighted score: Benefits criterion	Unweighted score: Equity criterion	Final weighted score
Option 1 – Current program	-4	2	-2	<b>-1.33</b>
Option 2 – Enhanced regulatory program	-5	2	-2	<b>-1.67</b>
Option 3 – Enhanced industry management	-2	3	3	<b>1.33</b>
Option 4/The Base Case – full deregulation	0	0	0	<b>0</b>

### 6.3.4 Risks and implementation considerations for the preferred option

#### 6.3.4.1 Risks

The preferred option carries some risks, which may erode its effectiveness like:

- The preferred option’s success is dependent on some rather significant changes to industry culture including:
  - greater transparency amongst industry participants regarding footrot
  - reduced stigma associated with the disease
  - a culture of collective responsibility, and collective action on footrot
  - shared learnings on the most effective ways to manage the disease.

The benefits of this option are at risk if this transition in industry culture is not achieved.

- The preferred option’s success is also dependent on the quality of investment in tools to upskill farmers in recognising and responding to footrot, and access to professional advice on footrot (vets, PIRSA staff etc.). The engagement with these resources and subsequent adoption of the advice is key to achieving the benefits outlined in this report. Whilst education can be provided, there is a risk of low industry engagement with such resources and subsequently low adoption of improved on-farm footrot management practices. This would in-turn place the benefits of Option 3 at risk.
- The analysis assumes that farmer ownership of biosecurity risks creates economic incentives to recognise and respond quickly to any footrot incursions, or suspected incursion. This includes taking preventative measures like quarantining introduced stock. It is however acknowledged that the ‘buyer beware’ model might not place sufficient pressure on farmers with footrot incursions to manage them effectively. This would likely reduce the production impacts and animal welfare benefits outlined in the analysis.

#### 6.3.4.2 Implementation considerations

Because the preferred option involves quite a significant change from the current program, there are some key implementation tasks that should be considered to foster a smooth transition should this option be adopted, including:

- **Stakeholder engagement** - Undertaking extensive consultation with industry to communicate any changes to the formal government position regarding the management of footrot in South Australia. This includes clearly articulating why the current program is not efficiently achieving its objectives, and how any revised program is likely to improve on the current situation. Industry buy-in is an important driver of success for a new program.
- **Ease the transition** – the preferred option is quite an adjustment for industry and it will take time for industry to adjust to the activities and practices outlined in the preferred option. We suggest the use of an interim program to assist farmers with the transition.
- **Marketing to improve culture and reduce stigma** – A key finding in this report relates to the effect that the stigma has by eroding the effective managing footrot. Perhaps a key activity to assist with the implementation of a new program would be an investment in some marketing materials to change the message pertaining to footrot.
- **Co-design and refine the future program** - The preferred option articulated in this report is high-level so we suggested that industry and government co-design the specifics on things like the most effective educational resources for farmers to recognise and respond to footrot incursions.
- **Reviewing outcomes** – consider a commitment to reviewing the effectiveness of a new program within a reasonable period (e.g., maybe 5 years post full implementation). To support this commitment, consider any data indicators that can be collected on a regular basis that may provide insights into how the transition went, and progress against the new program’s objectives.

### 6.4 Communication of decision for transparency

While the *Animal Health Decision Making Framework* was developed (as a precursor to this project), there was significant emphasis on the importance of industry consultation. It highlighted the importance of adequate and meaningful stakeholder engagement to capture representative industry views and incorporate them within decisions made using this framework. This report (and the options considered within it) has been informed by 60 interviews and a survey of 276 industry participants. Their diverse views have informed the options considered in this report and the analysis of those options.

The *Animal Health Decision Making Framework* also noted that it is equally important to effectively communicate the outcomes of decisions made using the framework. As such, should Livestock SA and PIRSA make any decisions to amend the current South Australia policy position on the management of footrot in South Australia, we would encourage extensive industry consultation to communicate these changes together with the rationale for such changes.

## 7. Conclusions and Recommendations

As reported in earlier sections, there is a general view across the industry that the current footrot control program needs to change. The primary issue is that there is significant under-reporting of cases of virulent footrot, which works against the aims of the program. In any regulatory disease control program, a key feature must be efficient surveillance so that disease locations can be identified and controls applied. This is not the case for the current program. There is also increasing recognition across Australia that regulation of endemic diseases is not efficient and that producers need to take greater individual responsibility for control of disease on their properties.

However, during consultation there was not a common view regarding exactly what changes to the program are required, apart from the two 'camps' described earlier; one calling for enhanced regulation, the other calling for deregulation. Hence, after listening to the views of a wide range of stakeholders, including footrot experts, the 4 options described in section 6.3 were developed and then assessed using a multi-criteria analysis.

In assessing the options, it was also considered important to be clear on what a future program should aim to achieve. Given that footrot is very widely distributed as an endemic disease and that this is unlikely to change, it is suggested that the aim, rather than focussing on reducing the number of footrot infected flocks, should focus more on reducing the economic and animal welfare impacts of footrot more broadly within the industry. This can be achieved through a combination reducing spread, eradicating virulent footrot from infected flocks where feasible and better in-flock control where eradication is not feasible. This is believed to be more likely if the stigma of footrot is reduced and education and communication about footrot is improved so that producers are more likely to seek help from appropriate experts.

**Recommendation 1:** *A future footrot control program in South Australia should aim to reduce the economic and animal welfare impacts of footrot across the South Australian sheep industry, by enhancing the understanding, diagnosis, prevention and management of footrot using a collaborative industry approach.*

There is a subtle change in philosophy inherent in this aim. Although not overtly stated, there has been a tendency in the past to 'turn a blind eye' to footrot in the southeast, given the acknowledged high prevalence and to focus more on protecting the lower prevalence areas. One of the reasons the program has become more controversial in recent years was a decision to apply the program and regulations more uniformly. However, if the focus of the program changes to reducing the overall impact of footrot across the entire industry, then attempting to reach a greater proportion of those in the high prevalence areas will be an important component. This also acknowledges the feedback from a number of industry people interviewed who were very concerned about addressing the animal welfare aspects of footrot and the potential reputational risk for the entire industry if not addressed.

The last part of recommendation 1 is considered critical. Despite being funded by industry, the current program is largely seen within industry as a government program. Apart from detailed enhancements, it is essentially the same in concept as has been in place for decades. Our first-hand experience is that animal health programs work best when key stakeholder groups are directly involved in program design and strategic management.

Simple consultation is not enough. We also note that a collaborative approach to biosecurity is a key plank of Australia's National Biosecurity Strategy<sup>47</sup> as well as South Australia's current biosecurity policy<sup>48</sup>, which states, *collaboration is central to our approach and there is an understanding of the accountabilities between governments, industries, communities and individuals.*

Whichever program model or option is ultimately chosen for the future, we strongly suggest that program management and design should apply this principle. This could simply take the form of an industry-government oversight committee, but the detail of the program design could possibly be developed through a planning workshop process. The latter is suggested, as although the four options are described in general, there will be various matters of detail that will need to be worked out. A range of other enhancements suggested during consultation are also documented in section 5.4. Provided the general thrust of the selected option is clear, designing the detail together will ensure greater industry ownership and support for the final, agreed program.

**Recommendation 2.** A future footrot control program for South Australia should be jointly designed and managed by industry and government.

Through applying the multi-criteria analysis in section 6, as well as consideration of the key issues that arose during consultation, we consider that option 3 as described in section 6.3.3 should be the preferred future model for management of footrot in South Australia. This option aims to address the key issue with the current program, that is, the avoidance behaviour commonly exhibited by producers, and encourages greater individual producer responsibility, both in controlling footrot and reducing its spread.

**Recommendation 3.** Option 3, *Enhanced industry management of footrot*, should be adopted as the model for future management of footrot in South Australia.

There is no 'perfect' option for the South Australian situation, each having its advantages and disadvantages. However, option 3 would appear to have the best chance of achieving program aims. We consider that the intent of recommendation 1 (*enhancing the understanding, diagnosis, prevention and management of footrot using a collaborative industry approach*) can only be achieved by at least partial deregulation to increase transparency, remove fear of consequences and remove stigma.

Further, its success depends also on providing better support to producers, but this success is not guaranteed. There is a level of uncertainty in relation to what percentage of producers who will take advantage of the increased level of support that should be available. This is the greatest risk with associated with selecting option 3. How well it is implemented will be critical. With this in mind, some key issues that should receive detailed consideration by program managers during the design process include:

---

<sup>47</sup> <https://www.biosecurity.gov.au/about/national-biosecurity-committee/nbs>

<sup>48</sup> [https://www.pir.sa.gov.au/\\_\\_data/assets/pdf\\_file/0008/188189/202009\\_SA\\_Biosecurity\\_Policy.pdf](https://www.pir.sa.gov.au/__data/assets/pdf_file/0008/188189/202009_SA_Biosecurity_Policy.pdf)



- Level of funding. We have assumed under option 3 that the existing funding will transition from regulatory activities to education, assistance, incentives etc. However, exactly how much funding is required will depend on the detailed program design process suggested under recommendation 2. Depending on the individual strategies chosen, increased funding could be required, but this will depend on industry's appetite or desire to spend greater or lesser amounts to support footrot control. Similarly, the industry could decide to spend less than currently and design a program to fit. However, reducing expenditure too far would essentially move the program towards that described under option 4.
- A key element of option 3 is enhancing the support available to affected producers. However, currently the number of experienced veterinarians and contractors with the required knowledge is limited. There is also a growing problem in rural Australia generally with declining numbers of veterinarians providing large animal services, particularly for the sheep industry<sup>49</sup>. Thus, how to enhance support services may be a real challenge for the new program. As suggested by one contractor, promoting the business case for new people to get involved may be part of the answer. In the short term at least, there is likely to be an important role for existing government people who have expertise in footrot control. The added benefit to this transition from a regulatory based role to a focus on support and education is that the role will become more rewarding professionally, compared with the stressful role that they have currently.
- The above issue will inevitably cause government to reflect on what should be the role of government in this program. The general trend across Australia is for governments to withdraw from endemic disease programs and focus more on emergency animal disease prevention and preparedness. We note that government only has an active role in footrot control in those states where industry funds the government component (South Australia, NSW and Western Australia). If the regulatory component is significantly reduced, then who delivers much of the program may be up for consideration, that is, government or private or a combination of both.
- Under option 3 it is suggested that one or more subsidies should be considered as an incentive for people to participate. Exactly what subsidies could or should be made available will be a key consideration for the detailed program design process, noting that large amounts of funds could potentially be expended. Subsidised initial consultations with a recognised professional to assist in designing an appropriate control / eradication program should produce good results with relatively modest expenditure. It may also help encourage professionals to become involved. Another area of potential investment highlighted during consultation is truck wash facilities to reduce disease transmission through that route<sup>50</sup>. A secondary question is whether any subsidies should be phased out over time.

---

<sup>49</sup> Source – Glanville and Millar 2023 report to DAFF on *Scoping of a Southern Australia Biosecurity Surveillance Network for Emergency Animal Disease Investigations*.

<sup>50</sup> The pig industry in South Australia is currently investing in such facilities to reduce the impact of a potential EAD event.

- Although option 3 has a significant deregulation component, the nature of any remaining regulatory provisions requires careful consideration. The main danger is that any revised provisions will perpetuate the existing problems. For example, the description of option 3 currently includes that it would be “illegal to sell clinically affected sheep at a saleyard or to another property without full disclosure”. The danger here is that this could be monitored rigorously, leading to continuation of some of the current discontent. If this provision is retained, or a variation on this, then a balanced approach will be required that could be established through development of a clear compliance policy.

It should also be noted that the new Biosecurity Act when introduced should bring with it more flexible regulatory options (assuming that it will be similar in nature to the new biosecurity legislation in Queensland, NSW and Tasmania). For example, these statutes incorporate the concept of the General Biosecurity Obligation or Duty<sup>51</sup> and associated policies may be developed to clarify people’s obligations in relation to footrot without the need for the disease to be notifiable.

Given that any regulatory provisions essentially represent government policy, albeit taking into account stakeholder views, there is also the possibility that government may decide to take deregulation further than desired by industry. That is, moving to a full deregulation approach (option 4). We note that a significant cohort of respondents called for full deregulation. However, we considered that option 3 provides for a more balanced approach and should be more acceptable to the majority of stakeholders.

- Another important component of option 3 is encouraging greater care when purchasing sheep and a ‘buyer beware’ culture within the industry. This could be supported by enhanced disease status declaration processes and associated education. A form of accreditation type system for high-risk enterprises like studs could also be explored. How to achieve a more robust disease status declaration system may be a challenge, given that the current process relies on a national, not state based declaration.

Some further issues arising from this analysis that are worthy of mention follow.

If the recommended approach is approved, it is likely to take some time before the details of the new program are finalised and for regulatory changes to be made. However, Livestock SA needs to make a short-term decision on program funding. Hence, a transition program is likely to be required. The simplest approach may be to approve the existing program funding application, but make adjustments to its management as much as is possible within the existing regulatory environment so that it is consistent with the intent of the new program. We also encourage extensive industry consultation to communicate the proposed changes, together with the rationale for such changes, as part of the interim program. Some

---

<sup>51</sup> The Queensland *Biosecurity Act 2014* includes, in part, “23 (2) The person has an obligation (a general biosecurity obligation) to take all reasonable and practical measures to prevent or minimise the biosecurity risk. (3) (b) to minimise the likelihood of causing a biosecurity event, or to limit the consequences of a biosecurity event caused, by dealing with the biosecurity matter or carrier or carrying out the activity;

sections of industry may become impatient if the agreed approach takes some time to implement.

**Recommendation 4.** Livestock SA should consider approving the existing program application for funding, provided it is acknowledged that it will be managed, where possible, in line with the future intended approach.

It became evident during the conduct of this review that outward facing documents available to industry and the public do not fully describe all components of the current program. For example, the different implications of a diagnosis of benign or virulent footrot are very clear in the internal PIRSA procedural document, but not on the PIRSA website. This is unacceptable and may partly explain some of the confusion that was evident amongst stakeholders. The program should operate with greater transparency so that potentially affected stakeholders are aware of the implications of a footrot diagnosis, how decisions are made, actions they should take and their control options. The internal procedural document is excellent and a version suitable for publishing on the PIRSA website should not be a difficult task. This would primarily involve modifying or removing internal procedures and instructions for PIRSA staff. Necessarily, this would need to be rewritten depending on the design of the future program, but should remain an important priority.

**Recommendation 5.** Communication to industry of the design and time frames for the future footrot control program should be given a high priority and a full description of program features and requirements should be published on the PIRSA website.

During consultation, a number of stakeholders advocated for national consistency in the approach to footrot control. Unfortunately, this is unlikely to happen unless all states ultimately move to deregulation. However, we note that NSW is currently redesigning their footrot control program following a recent review. While the details are yet to be finalised, in discussions with NSW officials their current thinking seemed to be remarkably similar to that described under option 3. It is suggested that program designers from the two states remain in touch with a view to maximising consistency, at least between these two states.

The footrot control program currently funds 3.5 full time equivalent staff positions within PIRSA. Given the relatively low staffing levels of the smaller states like South Australia this represents an important component of PIRSA's overall staff capacity and importantly, their ability to detect and respond to potential emergency animal disease (EAD) incidents. Depending on program design decisions, some or all of this funding could be lost to PIRSA, potentially reducing its response capacity. While we do not consider that this should be a primary consideration for industry when deciding on its future approach to footrot control, it is an issue for government and industry to consider in its future decisions around overall investment in biosecurity and the design of the footrot program. This appears to be an unintended consequence of a government investment decision made over 10 years ago regarding funding of animal health programs. The future program could be designed in such a way that PIRSA field staff continue to be involved, with the added benefit of improvements to South Australia's preparedness and ability to detect emergency animal diseases.

A related issue is whether this is the best way for industry to invest its limited resources. While investment in footrot control has been shown many times to have a positive

cost:benefit ratio, there is also the question of whether a better return on investment (ROI) could be achieved through investing in another area. For example, it is widely acknowledged that EAD early detection surveillance is inadequate in the sheep industry in southern Australia and improvements in this area could be considered worthwhile. However, these are difficult investment decisions to make when comparing low probability, very high impact events with issues such as footrot that are causing losses every day.

This is the first time that the new *Animal Health Decision Making Framework* developed for Livestock SA has been used. We consider that it has been a worthwhile exercise, providing more objective information upon which Livestock SA should be able to make an informed decision on the future of the footrot control program.

OFFICIAL

**Appendix A: Stakeholder categories and regional locations of people consulted individually.**

	Adelaide Hills	Interstate	Kangaroo Island/ Fleurieu	Northern	South East	Statewide	Total
<b>Footrot Contractors</b>	0	0	0	0	2	0	<b>2</b>
<b>Footrot Experts</b>	0	9	0	0	0	2	<b>11</b>
<b>Former Chief Veterinary Officers</b>	0	1	0	0	0	2	<b>3</b>
<b>Livestock Agents</b>	1	0	1	1	3	1	<b>7</b>
<b>PIRSA</b>	0	0	1	0	1	2	<b>4</b>
<b>Private Vets</b>	0	0	1	0	1	0	<b>2</b>
<b>Producers</b>	4	0	8	8	10	0	<b>30</b>
<b>Saleyards</b>	0	0	0	1	2	0	<b>3</b>
<b>Total</b>	<b>5</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>19</b>	<b>7</b>	<b>63</b>

Note that 4 producers also represented their roles within Livestock SA, the SA Livestock Research Council (SALRC) and Sheep Industry Funds.

# 3. Animal Health Decision Making Framework

1.

**Could it be worth investing in? (Use PESTLEOSS)**

Considerations include:

<b>Political</b>	Community/industry appetite regarding the disease and any Livestock SA/industry risk tolerance considerations
<b>Economic</b>	Is it likely that the proposal will generate a net benefit for the SA community/industry
<b>Social &amp; Ethical</b>	Effects on wellbeing, mental health, social connections and animal welfare impacts
<b>Technical</b>	Technical feasibility (including timeframes) and options to achieve outcomes
<b>Legal</b>	What is Livestock SA's/PIRSA's legal remit (Regulations, objectives, clashing legislation etc.)
<b>Environmental</b>	Environmental impact of the initiative
<b>Operational</b>	Organisational capability and capacity
<b>Safety</b>	Risks and hazards to safety of operations & safety aspects on human health
<b>Stakeholder engagement</b>	Stakeholder views on the investment proposal and other options to address the problem

If on the balance of these factors, the initiative appears to be a favourable investment, move to STEP 2

2.

**Who should be making the investment? (e.g., Is this a good fit for collective industry action/investment?)**



**Determine whether there is a role for a collective intervention?**

Would industry's collective investment in this initiative result in better outcomes for the SA industry than the results of individual actions? (i.e., does the investment have a public good element? – noting it should benefit the broader industry, not just select individual industry participants. Is collective action required/essential for individuals to receive a benefit?)

If there is a problem/issue, with a clear role for collective industry investment, which improves the outcomes for the whole SA industry, then move to STEP 3

3.

**What sort of action might be most worthwhile? (costs & benefits, risks – see details on next page)**



**Define the problem**

- Define the current situation including the spread of disease, the disease's current and expected impacts on the industry (and wider South Australian community), whether any funding is already committed and any legal obligations must be met.



**Options**

- Identify the key feasible options to address the animal health problem to be solved (not just the one in the investment proposal) and ensure adequate consultation is undertaken on options for stakeholder buy-in.



**Costs and benefits**

- Compare the key costs and benefits of each investment option, and the investment proposal with the highest net benefit to the South Australian industry should be the preferred investment proposal (see details on next page), unless there are other key factors identified in step 1.



**Risks and implementation considerations**

- Consider the key risks and implementation considerations (including any mitigation required) to ensure the intended benefits of the preferred option are realised

See details of Step 3 on next three pages

4.

**Communication of decision for transparency and governance**



**Communicate and justify decisions**

If the decision is **YES** invest/take action, then demonstrate:

- There is a role for collective industry investment from step 2, AND
- The investment proposal is expected to have favorable economic returns (including relative to competing proposals) and why

If the decision is **NO** don't invest, then demonstrate:

- There was no clear role for collective industry investment from step 2, OR
- The investment proposal is not expected to have favorable economic returns (including relative to competing proposals) and why

## 3. Animal Health Decision Making Framework (continued)

3.

### What sort of action might be most worthwhile? (costs & benefits, risks etc.)

3.1

#### Define the problem

- Define the current situation including the spread of disease, the disease's current and expected impacts on the industry (and wider South Australian community), whether any funding is already committed and any legal obligations must be met. These factors should be for both the current state and the anticipated future state (e.g., is it a growing problem without intervention?)

3.2

#### Identify the options

- Define a Base Case, which is the option with no intervention, or minimum intervention to meet any legal obligations related to disease management.
  - Include facts/assumptions on the extent to which the disease is present today and into the future (*a large part of defining a Base Case will already be captured in the problem*)
- Identify all feasible options to address the animal health problem (not just the one in the investment proposal) and ensure adequate consultation is undertaken on options for stakeholder buy-in

3.3

#### Undertake economic assessment

- Use a multi-criteria analysis (MCA) when it is not possible to value key costs and benefits. Use MCA scoring **costs** (50% weighting) against **benefits** (50% weighting).

Note: MCAs require a selection of criteria against which options are scored using evidence-informed judgement. These criteria are key factors affecting the choice between options, for example, the level of production losses that might be expected under the different options could be one criteria. Options are scored relative to a Base Case using a scale (e.g., scores below zero represent a negative impact compared to the Base Case with a score of -10 being a very significantly negative impact compared with the Base Case, and vice versa with a score of + 10 being a very significant positive impact relative to the Base Case). Once each criteria is scored for each of the options, the benefit and cost criteria are weighted at 50% each and the preferred option is the option with the highest weighted score.

Examples of cost and benefit criteria include (but aren't limited to):

Cost (50%)	Benefits (50%)
<ul style="list-style-type: none"> <li>Direct costs of intervention (e.g., treatments, program, surveillance, controls, stock movement)</li> <li>Indirect costs of intervention including indirect costs on farmers</li> <li>Negative market access issues of pulling back from current programs</li> <li>Lost fund revenue (e.g., sell stock interstate)</li> <li>Less production flexibility (for example restrictions on stock movements/production with TB)</li> </ul>	<ul style="list-style-type: none"> <li>Market access benefits (Revenue from outside SA markets in interstate or international markets – often prescribed in regulation/legislation)</li> <li>Avoided loss of market share to competitors</li> <li>More production flexibility</li> <li>Avoided production losses (animal growth restricted, or loss of products)</li> <li>Improved animal welfare</li> </ul>

- Consider distributional impacts – e.g., looking at fairness so who benefits and who is disadvantaged. Unreasonable distributional impacts may be a valid reason for selecting an option other than the preferred option identified through the MCA. Distributional impacts also look at issues like short term pain for long term gain.

3.4

#### Risks and implementation considerations

- Identify **risks** and undertake appropriate sensitivity analysis (e.g., "what if" scenario testing on the MCA results, for example, 'what if' costs are more, or benefits are less than expected)

OFFICIAL