Surveillance in Extensively Managed Livestock Conference

Friday 29 July 2016

University of Bristol

CONFERENCE REPORT

NOVEMBER 2016

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The aim of the Surveillance in Extensively Managed Livestock Conference, organised by APHA, was to bring together parties with existing or potential interest in the surveillance of disease and welfare threats in extensively managed cattle and sheep to share information and develop collaborative ways of working.

We invited a cross section of stakeholders from Government, industry, veterinary practice, retail and academic sectors to attend and to contribute to the initial development of a Centre of Expertise in this area at APHA Carmarthen Veterinary Investigation Centre (VIC). Whilst the development of the Centre of Expertise for extensively managed livestock at APHA Carmarthen VIC was an important outcome of Surveillance 2014, the centre will form part of surveillance activities and expertise across Great Britain (GB), and working in partnership is integral to future success.

In total, 55 representatives from industry, academia, retail, government and veterinary backgrounds attended the event on 29 July 2016 at the Life Sciences Building, University of Bristol. The day comprised short presentations, followed by group workshops with good networking and learning opportunities.

The facilitated workshops were successful in collecting a large amount of information from attending delegates in a restricted time. This was collected anonymously and without bias. There was the opportunity made for those unable to attend, to return any contribution they may have wished to be accounted and these were included in the collation of the workshop responses.

The provision was made to differentiate preferences or support for ideas by professional background. No clear trend in preference by professional background was identified. Between 34 and 49 distinct responses were given to each question posed, and in three of the four questions there were additional questions/issues raised by delegates for future consideration (Appendix 1a, 1b, 2a, 2b). Many of these responses had small numbers of endorsements by individual delegates from a range of professional backgrounds.

Furthermore, for each of the four questions posed to delegates during the workshop sessions it has been possible to identify two or three points that were consistently identified by delegates as of priority importance – these have been summarised in Tables 1 to 4 below.

This project is still in its infancy and the outcomes of this conference will feed into further development. It is the intention that the Centre of Expertise will collaborate with other individuals, groups and professional bodies across Great Britain. Ideas for future work were identified in this process and these can form the basis of project development in the future. For example, identifying areas of extensive livestock farming and utilising developments in technology.

Developing APHA Carmarthen VIC as a Centre of Expertise of extensively managed cattle and sheep, will give a hub of expertise and information for the whole of Great Britain. Further development of surveillance activities in extensively managed livestock is anticipated through partnership and engagement of different individuals, groups and organisations involved. In turn this contributes to the objectives and delivery of veterinary scanning surveillance, including the timely detection, investigation, characterisation and management of animal-related threats and diseases.

We were pleased that the majority of respondents felt the Conference met its aims and was a success.

Priorities highlighted during workshop sessions

The top outcomes are shown below with greatest support from delegates of multiple professional backgrounds listed in rank order, as recorded from all of the workshop sessions.

Q1a. What information do you have that you think could be useful in the surveillance of extensively managed cattle and sheep?
VIDA data, both diagnostic and diagnosis not reached for England and Wales, Scotland and Northern Ireland.
Private Veterinary Surgeon (PVS) invoicing data or other data collected by vets in practice and associated practice management software. An example cited was 'Vet Compass', a companion animal and horse knowledge hub run by RVC, which collates data from a number of veterinary practices. The veterinary products used by practices may indicate the syndrome suspected, but this does not take into account merchants sales (for example anthelmintic usage). Alternatively, on farm medicine records are a legal requirement.
Farm Mortality figures: this could be linked to fallen stock records. However, responses also cited concerns regarding accuracy of fallen stock figures, particularly for extensively managed sheep. Fallen stock records have the potential to include syndromic data.
Q1b. What information do you not have that you think could be useful in the surveillance of extensively managed cattle and sheep?
Improved access to the data that is already collected. There is a desire for this to be collated, searchable and harmonised. A need for this to be coordinated by an independent / unaffiliated body was clearly expressed.
A fundamental requirement is to clearly define 'extensive', estimate the number of extensive farms and understand their current livestock management practices.
The need to engage with the farmers who do not submit / interact with any diagnostic system, and may only rarely engage with their private veterinary surgeons.
Q2a. What do you consider to be an acceptable level of loss in extensively managed cattle and sheep?
Acceptable loss should be set for the individual farm based on stock, management and topography. This would allow benchmarking against ranges in similar enterprises. Reducing losses should be set in small achievable steps monitored and supported by the private veterinary surgeon.
What is acceptable depends on the cause of the loss: 'Why is any loss acceptable?'
Q2b. In the last 5 years or so what are the main changes you have seen that affect extensively managed cattle and sheep?
Positive - Sheep identification and improved traceability.
Negative - Reduced number of government laboratories and post mortem facilities; reduced access to government diagnostic facilities and the additional concern of where the new generation of farm animal vets and specialists, such as veterinary pathologists / virologists / bacteriologists etc. will come from.
Negative - Anthelmintic resistance in nematodes and triclabendazole resistance in liver fluke. Development of antimicrobial resistance.

Next Steps

The project plan for the ongoing development of the Centre of Expertise will be completed by March 2017. This plan will initially be presented to Defra and Welsh Government and will include activities that take account of the priorities identified during this conference. The development of the Centre of Expertise will also continue to be aligned with the wider work of the APHA's Species Expert Groups and Surveillance Intelligence Unit and related projects. Examples of the latter include:

- Investigate integration of existing data to map areas of extensive livestock and identify relevant surveillance information.

- Provide access to APHA VIDA data through a diagnostic data 'Dashboard' to farmers and veterinary surgeons.

- Develop specific webpages for the Centre of Expertise.

- Hold a second conference during the latter half of 2017.

- Wider publication of the outputs of this conference and subsequent projects.

- Identification of possible research questions to take forward as part of collaborative projects.

POST-CONFERENCE FEEDBACK

Chief Veterinary Officer for Wales, Christianne Glossop said: "Establishing a Centre of Expertise in APHA Carmarthen to improve disease surveillance in extensively-managed livestock was an important outcome of the Surveillance 2014 review. Disease surveillance is crucial to protect animal health and welfare, and also public health. Early detection of diseases in extensively-managed livestock poses particular challenges, but also opportunities to apply new approaches and technologies to early detection of threats in animals that are not under close and regular supervision. The conference enabled people representing the whole food-chain to come together and share their knowledge and it provided a really good base for collaborative working and I look forward to the Centre developing as a result."

Gordon Hickman, Defra Policy Lead for Surveillance and New & Emerging Disease said: "The conference was a key milestone in the establishment of the Centre of Expertise for Extensively Managed Livestock and it was great to see so many delegates from across the whole of the food chain and from all parts of GB. Disease surveillance and the early detection of threats to animal and public health and animal welfare poses particular challenges in this sector, but by working together, sharing best practice and using innovative new technology we can make significant progress together. I look forward to seeing the Centre continue to develop from vision into reality."

Phil Stocker, NSA Chief Executive said "This event was a great opportunity to talk about the flock health scheme that NSA has been proposing for some time now, and how these proposals are even more appropriate given the direction farm support is likely to go post-Brexit. It was also good to see the NSA report on the complementary role of sheep in upland and hill areas referred to in the debate today, given that it was only published in recent days. It is good that we have formed a well-researched basis for these conversations."

Richard Irvine, Head of the APHA Surveillance Intelligence Unit acknowledged the contribution of the speakers and facilitators at the event and said "the data, feedback and networking generated from the conference and this report will help to drive the development of the Centre of Expertise at APHA Carmarthen and help to generate new collaborative surveillance projects and outputs".

The Organising Committee would also like to thank the delegates that responded to the online survey after the conference. We were pleased that the majority of respondents felt the conference met its aims and was a success, rating it as 'Excellent'.

APHA Organising Committee
October 2016

Sian Mitchell, Veterinary Investigation Officer, APHA Carmarthen
Richard Irvine, Head of the Surveillance Intelligence Unit, APHA Weybridge
Adrienne Mackintosh, Veterinary Investigation Officer, APHA Carmarthen
Sarah Stewart, Stakeholder Engagement Manager, APHA Weybridge

CONFERENCE PROGRAMME

10:30	**Welcome** Richard Irvine, Head of Surveillance Intelligence Unit, APHA
10:35	**Chair: Richard Irvine, APHA** **The Centre of Expertise at APHA Carmarthen** Gavin Watkins, Welsh Government
10:50	**Surveillance in Extensive Livestock - what has been published?** Sian Mitchell, APHA Carmarthen
11:05	**The role of Species Expert Groups and the Surveillance Intelligence Unit (SIU)** Amanda Carson, APHA
11:20	Question and answer session
11:30	Coffee break
11:50	*Chair: Gordon Hickman, Defra* **A veterinary surgeon's view of surveillance in a Scottish situation** Ian Gill, Scotland
12:05	**The view of a beef and sheep farmer** John Yeomans, Mid Wales
12:20	**Sheep scab in Wales** Richard Wall, University of Bristol
12:35	**Vector borne diseases of extensive cattle and sheep** Paul Phipps, APHA Weybridge
12:50	Question and answer session
13:00	Lunch
13:45	*Chair: Richard Irvine, APHA* **Spatial mapping of parasite risk and sheep movement** Caroline Liddell, University of Exeter
14:00	**An Introduction to Agrimetrics** Simon Davis, Agrimetrics Research Ltd., Rothamsted Research
14:15	Question and answer session
14:25	**Introduction to workshops** Adrienne Mackintosh, APHA Carmarthen
14:35	**Workshops** – Two sessions of 25 minutes Facilitators: Sara Robertson, Adrienne Mackintosh, Lesley Stringer, Amanda Carson, Jane Tennant (APHA) and Alison Braddock (SRUC)
15:35	Coffee
15:55	**Final summary** Richard Irvine, APHA
16:00	Finish & Depart

SUMMARY OF CONFERENCE PRESENTATIONS

55 representatives from industry, academia, retail, government and veterinary backgrounds attended the event at the Life Sciences Building, University of Bristol. The day comprised short presentations, followed by group workshops with good networking and learning opportunities.

Richard Irvine, Head of the Surveillance Intelligence Unit (SIU) of the APHA welcomed delegates and introduced the day. Whilst the development of the Centre of Expertise for extensively managed livestock at APHA Carmarthen Veterinary Investigation Centre (VIC) was an important outcome of Surveillance 2014, the centre would form part of surveillance activities and expertise across Great Britain (GB) and working in partnership is integral to future success. Gavin Watkins, Senior Veterinary Officer at the Welsh Government gave the first presentation with the history of the initiative, the primary aim of which is to strengthen GB animal disease surveillance capability and specifically, to fill a current "surveillance gap" associated with disease and welfare threats in extensively managed livestock. The development of a Centre of Expertise at APHA Carmarthen should contribute to, and promote, the use of novel data and information sources for animal disease surveillance. It will also encourage development of relevant skills and promote partnership and responsibility-sharing through working with stakeholders.

Sian Mitchell of APHA Carmarthen spoke about the results of a literature review into veterinary surveillance of extensively managed livestock. The use of smart technology featured in a number of papers found on individual projects. Wireless sensor networks and use of GPS collars, ear tags or boluses, unmanned aerial surveillance and mobile phone SMS messaging and apps were examples of technologies used. Published surveillance methods included syndromic, participatory and sentinel.

Amanda Carson, Head of the APHA Small Ruminant Expert Group (SREG), presented information about APHA's work in the timely detection and investigation of animal-related new and re-emerging threats and the actions taken. Examples of Veterinary Investigation Diagnosis Analysis (VIDA) data collected and other surveillance reports and outputs were given. The numerous connections of the SREG with a wide range of stakeholders were also detailed.

These first three presentations each emphasised that any new work in this area would complement and add to existing scanning surveillance already carried out in GB.

A perspective from a veterinary practitioner was given by Ian Gill, until recently working in Kirriemuir, Scotland, where the problems such as lack of skilled manpower, little veterinary input, limited opportunities to investigate disease and distance from veterinary laboratories were balanced with examples of successful collaboration projects with veterinary practices, farmer groups and others on enzootic abortion in ewes, sheep scab and tick control.

John Yeomans, a beef and sheep farmer in mid Wales gave his view of surveillance. He advocates monitoring herd and flock performance and using this information to improve productivity.

More detailed information followed on two relevant projects. Prof. Richard Wall of the University of Bristol spoke on a recent project, studying sheep scab in Wales and Paul Phipps of APHA Weybridge on an investigation of sheep on the Kent marshes. In this, clinical disease was associated with a tick borne protozoan parasite previously not identified in GB. Caroline Liddell, a PhD student from the University of Exeter gave a talk on the use of unmanned aerial vehicles (UAVs or drones) which will be used in her PhD studying spatial mapping of livestock and associations with parasite risk, and highlighted the increase in the use of UAVs in research.

Finally Simon Davis, the Business Development Manager of Agrimetrics spoke about a collaboration of various organisations, which will bring agri-food production data into one accessible place, with the aim of creating a more resilient, profitable agri-food system.

WORKSHOP SUMMARY

1. Introduction

One of the key aims of veterinary scanning surveillance is to provide an early warning system to allow timely detection and investigation of new and re-emerging conditions and threats, with action. Surveillance of extensive livestock is a specific and tailored area that feeds into the wider surveillance system as operated by APHA.

Extensive livestock are defined in this context as: those animals (primarily cattle and sheep) that are kept in such a way, for example in extensively grazed areas, as to make it difficult for them to be regularly and closely inspected for signs of ill-health or significantly altered production.

Scanning surveillance in extensively managed cattle and sheep presents additional challenges. In a move to help develop surveillance in this area further, APHA Carmarthen Veterinary Investigation Centre is being developed as a Centre of Expertise for this area of surveillance as part of the agreed outcomes of Surveillance 2014 - Changes to the delivery of Veterinary Scanning Surveillance in England and Wales, December 2013.

Following the presentations delegates participated in interactive facilitated workshop sessions to share perspectives, information and ideas relating to the performance and development of surveillance in extensively managed livestock, principally cattle and sheep.

2. Questions & Delegate Responses

The workshops were designed as facilitated sessions to allow the collection of contributions anonymously and without bias. This meant that on collation and analysis, contributions could be judged on merit rather than on the status of the person presenting them. A total of four questions were posed (questions 1a, 1b, 2a, 2b) to delegates.

Questions were designed to be simple and open to stimulate discussion within the groups. Each workshop session group had a range of professional backgrounds represented. After addressing each question, the delegates were asked to mark the three contributions they supported the most with a coloured marker that identified their professional group. This allowed us to assess whether priorities varied between professional groups. For every question no clear trend in preference by professional background was identified.

A summary of the responses and themes that emerged from each of the four questions and all workshop session groups are provided below - sections 2.1.1, 2.1.2, 2.2.1, 2.2.2.

A more detailed description of the delegate responses and further issues raised from all workshop session groups to all four questions is provided in Appendix 1a, 1b, 2a and 2b.

2.1.1 Question 1a:

What information do you have that you think could be useful in the surveillance of extensively managed cattle and sheep?

From all of the suggested information sources raised in answer to this question, the most common feature was that there is already a very large amount of data both at producer level that is not being systematically collected, and at a higher institutional and government level that is not always available for others to use.

A strong theme that emerged was that it is important that whatever analyses are developed following data collection it should take into account what producers want and need. Some additional work is required to define producers/farmers requirements.

It transpired that retailers hold a large amount of producer information about their own suppliers and other producers. This includes such things as; forage hectares, breeding numbers, welfare flags at abattoir and welfare outcomes, welfare impacts of parasites, farm inputs and outputs, veterinary therapeutic or other interventions, genetic comparisons, antimicrobial resistance (AMR) and yield analysis. This information is systematically collected and analysed by retailers to support sustainable production and welfare optimisation amongst other commercial decisions. Retailers pay for this information, it is commercially sensitive and therefore not publicly available. The retailer's approach to data sourcing and the choice of data collected is one that it may be useful to investigate.

The table below summarises the three responses with the greatest support from delegates across the spectrum of professional backgrounds. There were 38 distinct responses and a further eleven that raised questions for future consideration. These are available in Appendix 1a.

Q1a. What information do you have that you think could be useful in the surveillance of extensively managed cattle and sheep? **Top outcomes with greatest support from delegates of multiple professional backgrounds in rank order**
VIDA Data, both diagnostic and diagnosis not reached for England and Wales, Scotland, and Northern Ireland.
Private Veterinary Surgeon (PVS) invoicing data or other data collected by vets in practice and associated practice management software. An example cited was 'Vet Compass', a companion animal and horse knowledge hub run by RVC, which collates data from a number of veterinary practices. The veterinary products used by practices may indicate the syndrome suspected, but this does not take into account merchants sales (for example anthelmintic usage). Alternatively, on farm medicine records are a legal requirement.
Farm Mortality figures: this could be linked to fallen stock records. However, responses also cited concerns regarding accuracy of fallen stock figures, particularly for extensively managed sheep. Fallen stock records have the potential to include syndromic data.

2.1.2 Question 1b:

What information do you <u>not</u> have that you think could be useful in the surveillance of extensively managed cattle and sheep?

When presented with this question, there was general agreement that it would be very useful to know what is already collected and to make best use of this. A recurring theme in discussions was the need to reduce the replication of work and data. Beyond this, projects could be commissioned to fill the gaps.

An interesting point raised was the potential benefit of following up with participants of short studies / surveys. These producers have already demonstrated that they are engaged, and therefore would likely engage on further occasions if they felt it was a beneficial exercise. Follow up data could be immensely useful in understanding the impact that information gleaned from these studies / surveys has on subsequent decision making and management practices.

The table below summarises the three responses with the greatest support from delegates across the spectrum of professional backgrounds. There were 34 distinct responses and a further five that raised questions for future consideration (Appendix 1b).

Q1b. What information do you <u>not</u> have that you think could be useful in the surveillance of extensively managed cattle and sheep? **Top outcomes with greatest support from delegates of multiple professional backgrounds in rank order**
Improved access to the data that is already collected. There is a desire for this to be collated, searchable and harmonised. A need for this to be coordinated by an independent / unaffiliated body was clearly expressed.
A fundamental requirement is to clearly define 'extensive', estimate the number of extensive farms and understand their current livestock management practices.
The need to engage with the farmers who do not submit / interact with any diagnostic system, and may only rarely engage with their private veterinary surgeons.

2.2.1 Question 2a:

What do you consider to be an acceptable level of loss in extensively managed cattle and sheep?

Although there are industry standards, when faced with the question above, there was a large range of percentage loss that different people would consider acceptable. The following question was raised: 'Why is any loss acceptable?'

It was suggested that knowing the losses on individual farms and assessing by benchmarking against ranges in similar enterprises would be more useful. A farm health plan could then be monitored with the private veterinary surgeon with the aim of reducing these losses. An investigation into what level of loss should trigger investigation or further action would be beneficial at farm level and for our understanding of trigger points.

The impact on welfare should always be considered when assessing 'acceptable' loss.

Additional losses considered were financial and related to the fluctuating and predominantly reducing price of produce combined with an increased cost of commodities.

The table below summarises the two responses with the greatest support from delegates across the spectrum of professional backgrounds. It was not possible to separate out a third response to this question with a clear majority of support. There were 38 distinct responses and a further one that raised questions for future consideration (Appendix 2a).

Q2a. What do you consider to be an acceptable level of loss in extensively managed cattle and sheep?
Top outcomes with greatest support from delegates of multiple professional backgrounds in rank order
Acceptable loss should be set for the individual farm based on stock, management and topography. This would allow benchmarking against ranges in similar enterprises. Reducing losses should be set in small achievable steps monitored and supported by the private veterinary surgeon.
What is acceptable depends on the cause of the loss: 'Why is any loss acceptable?'

2.2.2 Question 2b:

In the last 5 years or so what are the main changes you have seen that affect extensively managed cattle and sheep?

There were a range of both positive and negative changes that were identified by the delegates; top of the positive changes was improved sheep identification and therefore traceability. This has increased further with the introduction of the EID tag. Another significant positive recorded change was the steady uptake of technology which has the potential to improve efficiency, recording, reporting and communications on farm.

The aging population demographic of the farming industry was a negative change identified along with increased time pressures and decreased profitability of farming. Another negative change that was voiced by most delegates was the reduction in government diagnostic laboratories. However, access to diagnostic services and the surveillance role offered by alternative providers and the development in small post mortem centres was highlighted. There was concern expressed about succession and provision of future expertise in areas of farm animal practice and specialist roles such as veterinary pathology, virology, bacteriology etc.

Noted as a negative change was the development of resistance to certain veterinary medicines. Antimicrobial resistance is a topical subject, but having the greater impact on the extensively managed cattle and sheep sector is the rise in anthelmintic resistance of nematodes and triclabendazole resistance in liver fluke (*Fasciola hepatica*). This though is thought to have had the positive effect of reducing indiscriminate usage of such products and hopefully the adoption of a more holistic and consequently sustainable approach to endoparasite control.

Environment was a subject that came up a number of times both in relation to changing climate, but also the change in funding to farmers. With environmental stewardship schemes etc. farmers have been financially incentivised to 'farm less land'. Change in breed preference and farming practices has led to a reduction in the sheep population that are managed extensively e.g. hefted, and a resultant change in vegetation.

The table below summarises the three responses with the greatest support from delegates across the spectrum of professional backgrounds. There were 49 distinct responses (Appendix 2b).

Q2b. In the last 5 years or so what are the main changes you have seen that affect extensively managed cattle and sheep?
Top outcomes with greatest support from delegates of multiple professional backgrounds in rank order
Positive - Sheep identification and improved traceability.
Negative - Reduced number of government laboratories and post mortem facilities; reduced access to government diagnostic facilities and the additional concern of where the new generation of farm animal vets and specialists, such as veterinary pathologists / virologists / bacteriologists *etc.* will come from.
Negative - Anthelmintic resistance in nematodes and triclabendazole resistance in liver fluke. Development of antimicrobial resistance.

3. Conclusions

The facilitated workshops were successful in collecting a large amount of information from attending delegates in a restricted time. This was collected anonymously and without bias. There was the opportunity made for those unable to attend, to return any contribution they may have wished to be accounted and these were included in the collation of the workshop responses.

The provision was made to differentiate preferences or support for ideas by professional background. No clear trend in preference by professional background was identified. Between 34 and 49 distinct responses were given to each question posed, and in three of the four questions there were additional questions/issues raised by delegates for future consideration – these are detailed in the appendices (Appendix 1a, 1b, 2a, 2b). Many of these responses had small numbers of endorsements by individual delegates from a range of professional backgrounds.

Furthermore, for each of the four questions posed to delegates during the workshop sessions it has been possible to identify two or three points that were consistently identified by delegates as of priority importance – these have been summarised in Tables 1 to 4 above.

This project is still in its infancy and the outcomes of this conference will feed into further development. It is the intention that the Centre of Expertise will collaborate with other individuals and professional bodies across Great Britain.

Ideas for future work were identified in this process and these can form the basis of project development in the future. For example, identifying areas of extensive livestock farming and utilising developments in technology.

Developing APHA Carmarthen VIC as a Centre of Expertise of extensively managed cattle and sheep, will give a hub of expertise and information for the whole of Great Britain. Further development of surveillance activities in extensively managed livestock is anticipated through partnership and engagement of different individual groups and organisations involved. In turn this contributes to the objectives and delivery of scanning surveillance, including the timely detection, investigation and management of animal-related threats and diseases.

4. Next Steps

The project plan for the ongoing development of the Centre of Expertise will be completed by March 2017. This plan will initially be presented to Defra and Welsh Government and will include activities that take account of the priorities identified during this conference. The development of the Centre of Expertise will also continue to be aligned with the wider work of the APHA's Species Expert Groups and Surveillance Intelligence Unit and related projects. Examples of the latter include:

- Investigate integration of existing data to map areas of extensive livestock and identify relevant surveillance information.
- Provide access to APHA VIDA data through a diagnostic data 'Dashboard' to farmers and veterinary surgeons.
- Develop specific webpages for the Centre of Expertise.
- Hold a second conference during the latter half of 2017.
- Wider publication of the outputs of this conference and subsequent projects.
- Identification of possible research questions to take forward as part of collaborative projects.

APPENDICES

Appendix 1a

The bullet points below are a record of all outputs collected in no particular order. Please note that some have been amalgamated because of similarity. Each star (*) represents an endorsement by a delegate. The original records collected at the conference on 29/07/16 have been retained at APHA Carmarthen VIC.

Q1a: What information do you have that you think could be useful in the surveillance of extensively managed cattle and sheep?

Q1a Responses

1. ************Diagnostic data and VIDA including Northern Ireland and Scotland APHA Diagnosis and DNR (Diagnosis Not Reached) data.

2. Monitoring samples data – not currently included in VIDA – from APHA, SRUC and other labs.

3. Fallen stock post mortem information, may be from PVS (private veterinary surgeon) or private providers – could it be recorded (e.g. in proposed 'VIDA Lite')?

4. ******Fallen stock syndromic data collection – likely to need additional information collected at pick up, but already has a database of mortality per species and some gross information. Membership gets communications via newsletters.

5. SAM (APHA's farm/customer database).

6. NADIS (National Animal Diseases Information Service), disease trends and warnings, geographical and seasonal changes.

7. Animal Reporting and Movement Service (ARAMS), Animal and Public Health Information System (APHIS)

8. ********All farms have mortality figures – linked to fallen stock, question of accuracy particularly for extensively managed.

9. *Abortion rates – cattle abortions should be reported - information held with APHA field services.

10. *Info about farms and vets that submit for diagnosis to APHA

11. TB test results APHA government and WLBP (Welsh Lamb and Beef Producers)

12. Cattle keeper demographics WLBP

13. **Animal population data held by government and APHA.

14. *Animal census data herds/holdings location linked. June and December survey – livestock numbers, cropping, labour employed etc.

15. Land use, common land use, habitat land.

16. Agri environment schemes ?CAP (Common Agricultural Policy) linked.

17. Data frameworks for Scottish pig, cattle and sheep. Similar for other administrations

18. Human census data, workforce age demographic, reducing number in agricultural workforce.

19. **Abattoir data; numbers, grading, rejections, source. – may need to trace back if sold as stores off the extensive systems. E.g. average weight of animal slaughtered in Wales/from a specified region. MHS (Meat Hygiene Service) and FSA (Food Standards Agency).

20. **Abattoir welfare indicators and triggers at abattoirs, MHS and APHA welfare investigations.

21. *********PVS(Private Veterinary Surgeon) invoicing data, prescribed medicines if clinical notes unavailable, drugs used may indicate syndrome suspected – does not take into account merchants sales e.g. anthelmintics. On farm medicine records, Vet compass (RVC companion animal practice data) and SAVSNET (Small Animal Veterinary Surveillance Network) collect similar info for the small animal sector.

22. Merchants sales data – roughly geographical but cannot pin down to farm level without customer account personal details.

23. **Movement data plus medicines use data could be submitted online, this is being done voluntarily with good uptake in the pig sector.

24. Demonstration farm data including production. Coleg sir gar/Mentor a Busnes.

25. *The Scottish Animal Health Planning System (SAHPS) production data.

26. **Bench marking from farmers groups.

27. *Health schemes – disease status e.g. BVD.

28. ***Farm records: disease incidence, barren ewes, health check and growth monitoring, lambing /calving percentage. Scanning data (held by AHDB, Agriculture and Horticulture Development Board)

29. Retailers hold a huge amount of data about their own suppliers and other producers, but this data is purchased. Includes number of forage hectares, breeding numbers, welfare flags at abattoir and welfare outcomes, welfare impacts of parasites, farm inputs and outputs, medical or otherwise interventions (may or may not be veterinary), genetic comparisons, AMR (anti-microbial resistance), yield analysis. All of this provides information for sustainable sourcing but also used for research and development.

30. There is a lot of unpublished data held by academic institutions and others. It is archived and some is publicly available – how to access the archive?

31. Commissioned surveys e.g. by farming unions – usually in response to an issue, e.g. parasite resistance. Targeted surveillance and good add- on information.

32. Outcomes of RDP (Rural Development plan) funded projects e.g. flock management, EID (electronic identification).

33. Animal ID – lifelong traceability of movements.

34. CTS (Cattle Tracing Scheme) for cattle movements and mortality. Need abortions recorded/failure to breed, use mortality threshold as trigger for active surveillance.

35. ***EID in sheep data held, but could be developed. Use to trace changes in trends sold as fat or store lambs – indicate production changes.

36. Hogget retention scheme ?Scotland.

37. Genetics. Performance needs to take into account growth, production and disease susceptibility. Pedigree flocks/herd can trace for decades. – breed societies. Commercial not as well documented. Extensively managed may be even more difficult e.g. a number of tups/rams will be turned out to a group of ewes. Even if raddles are used, the successful mating is unlikely to be well documented to trace sire of lambs.

38. Tick parasite data, especially grouse in relation to grazing sheep.

Q1a Further Questions & Issues

1. Need to assess what appetite there is for benchmarking and progress information from the producers.

2. Need knowledge to link the data – agrimetrics?

3. We will need to consider paying for on- farm data collection, but need to be able to identify if this work has already been done and can this data be accessed rather than duplicate.

4. *****Need to give farmers what they want – what do they want?

5. Need to identify trends that will be useful for the farmer to know about.

6. When surveys are done and may include testing, generally there is no follow up. If survey information is made available, can this be used to instigate follow up of issues identified? Currently it may fall back to private vets, but no collation.

7. Still need clarification about how to categorise extensively managed cattle and sheep. Post code/hill upland/CPH. NB. Lowland sheep may be extensively managed. Defra's inspection for cross compliance identifies farms as extensive.

8. For future expansion, wild boar farms, deer farms, wild deer, wild managed deer – contact with hefted sheep other wild life schemes, Game and Wildlife Conservation Trust.

9. **Attendance at knowledge transfer engagements to assess farmer engagement.

10. **Survey mortality percentage that will trigger farmer action – see Q2.

11. Assessment of bias in reporting may be worth considering.

Appendix 1b

The bullet points below are a record of all outputs collected in no particular order. Please note that some have been amalgamated because of similarity. Each star (*) represents an endorsement by a delegate. The original records collected at the conference on 29/07/16 have been retained at APHA Carmarthen VIC.

Q1b. What information do you <u>not</u> have that you think could be useful in the surveillance of extensively managed cattle and sheep?

Q1b Responses

1. *************Improved access to data that already exists; collated and searchable library/central coordination of data, could data sets be harmonised? Should be independent body. Industry needs access to data to prove or mitigate a given issue.

2. *Future project proposals – could allow for collaboration, if intention is known.

3. Lots of data. Need to clarify what data will be used/and is useful.

4. *Better/clearer consent from producers for data sharing (can be anonymised data). May encourage data that is not normally shared to be made available, includes farm production and financial details.

5. *****Engage with the farmers who don't submit; target their vets for information.

6. **SAVSNET (Small Animal Veterinary Surveillance Network) need a farm animal equivalent – this will service all areas including extensively managed.

7. Make available data that is currently withheld, e.g. RDP (Rural Development Plan) funded projects yield much information, but often data is not publicly available.

8. *Funded projects should have conditions attached that info is made publicly available

9. *Follow up on previous projects. Have farmers used their project data/changed practices because of taking part? These farmers were already engaged to be part of the initial survey.

10. ***Retailers hold a wealth of information. This has an economic value and may be commercially sensitive.

11. Red Tractor, EBLEX (AHDB Beef and Lamb), AHDB.

12. Welfare risk assessments APHA/Local Authority.

13. Industry standards for benchmarking lameness, abortions etc. - need wider availability to these figures.

14. Antibiotic and anthelmintic usage. NB need to ensure farmer knows this is not a judgement and appropriate dosing and usage is important.

15. Animal behavioural information, Tagging Collars, GPS-Drone/other activity surveillance data

16. Factors that influence farmer decision making e.g. vaccination, treatments, animal movement

17. Host and parasite mapping for the areas a farmer will graze.

18. Is there BTV in sheep on the hills in Wales now? Forecast data, survey samples, disease notifications in other areas to raise alerts.

19. ******How many extensive farms are there, how extensive are they? What are they doing? How? Where? How often are the animals inspected?

20. Adopt a system where vets report includes GPS location and pictures etc. as used in Africa.

21. Official record of animal counted on and off of common/extensive grazing parcels of land.

22. Mortality figures and age group affected. Fallen stock records this already and would like to develop syndromic data collection and simple on site testing. Farm level record may be able to identify the 'black losses – those that disappear. Could target investigation on this area once identified.

23. Vet health plan data. Needs to be collatable. Have figures: production facts and production goals.

24. TB data, health information for contiguous farms after a TB breakdown of a neighbour. Better definition of radius and contiguous for disease status

25. **Systematic examination of carcases at fallen stock centres from extensive systems – needs to be free to the farmer and not incur cost for the fallen stock company.

26. **On farm disease status e.g. mild disease – temperature monitoring could give morbidity levels of mild disease, stimulate further investigations. Daily livestock checks – syndromic data collection at farm level.

27. Need to be able to interrogate the different data capture systems. E.g. Moredun's LIMS, same for APHA SAM, etc.

28. ***FSA CCIR (Food Standards Agency Collection and Communication of Inspection Results) including food chain information condemnations at slaughter, and livestock market data.

29. *Comprehensive feedback from slaughterhouses – should this be audited e.g. veterinary inspection of a percentage.

30. **Tracing movements by EID/ CTS? Confidentiality of making this available publicly.

31. **Testing results from private labs including basic submitter information.

32. Bulk milk testing data – monitoring often private labs including survey samples as part of targeted surveillance. NB dairy not generally managed extensively.

33. Sheep and goat survey results: targeted surveillance, but possibility of archiving samples for testing for other things as identified by surveys.

34. **Can VIDA be made public?

Q1b Further Questions & Issues

1. Can PVS be conduit of farm information and information returned to the farmer? Farmer needs to trust the motives of the body collecting their information.

2. Feedback to the farmer needs to be targeted, relevant and wanted. An avalanche of information will lose its relevant point. Need to investigate communication strategy.

3. Technology is the future – can it be used at farm level, for information collection, analysis and for info dissemination.

4. Tick diseases – horses / dogs / people. Out of scope of 'livestock,' but could influence extensively managed cattle and sheep populations.

5. Parasites e.g. tapeworm in dogs and people. Out of scope of 'livestock', but information may affect extensively managed cattle and sheep that may act as intermediate host.

Appendix 2a

The bullet points below are a record of all outputs collected in no particular order. Please note that some have been amalgamated because of similarity. Each star (*) represents an endorsement by a delegate. The original records collected at the conference on 29/07/16 have been retained at APHA Carmarthen VIC.

Q2a. What do you consider to be an acceptable level of loss in extensively managed cattle and sheep?

Q2a Responses: Sheep

1. Make an inventory of losses at specified times scanning, lambing, weaning, sale – flock health plan.

2. In Scotland lambs reared per 100 ewes 85-111.

3. Hill 5%, lowland 2%, differences by breed and type.

4. 30-35% replacement rate. If lower involuntary losses, can increase selective culled animals and improve flock.

5. ****Breeding ewes 2-3% (considered optimistic – industry including lowland is 5-7%).

6. Rams 1.5% want less than 1%per month. Again group variation some reported over 10-15% as being unacceptable.

7. **Neonatal lambs 5-7% depends on season, weather etc.

8. *Growing lambs 5-7% but others consider up to 20%loss as acceptable. One measure is 1% loss per month from weaning to sale.

9. **Abortions/barren ewes 5%.

10. Scanning to sale lambs<15% loss is benchmark. Reality is 10-30%.

11. ***Surveillance-5% loss threshold for investigation.

12. ***Disease investigation – anything above normal for that premises.

13. *Mortality spikes may go unnoticed. Stock evaluated at scanning, sale, market, other handling.

Q2a Responses: Cattle

14. In Scotland 94-96 calves born/100cows bred. 88% of those reared Calving practices will affect neonatal and dam loss.

15. Neonatal calves 3-5%.

16. Growing cattle 2-3%.

17. Breeding stock 2% depends on age demographic.

18. ***Calving index ideal still said to be 365 but reality is 430 – dairy, not beef?

19. Published figures for losses by HCC (Hybu Cig Cymru) and AHDB farm business surveys etc.

20. ****Why is any loss acceptable? Depends on the cause of the loss.

21. Preventing loss is more important.

22. Changes from baseline production, increased finishing time, increased medicine use, feed input is costly.

23. *Where are the losses, where can it be improved?

24. Depends on market and production costs.

25. Open or closed flocks, does loss increase with common grazing?

26. *As long as your loss is less than your neighbour's loss – this needs to stop.

27. **Welfare implications determine what loss is acceptable, death or production loss.

28. If loss in genetically valuable animal this loss is less tolerated.

29. **Must consider cost benefit. Loss costs more than prevention (or it should).

30. **If economically viable to maintain a loss then no incentive to deal with the issues.

31. Industry should set a standard %age beyond which action/intervention is taken.

32. ******Set individually? Type of farm where they are and what they can realistically aim for in small steps dependant on management and stockman skills. Bench mark.

33. Practical aspect and loss – real world factors.

34. Not all farmers are strong business people.

35. *Is this question too simple?

36. Highest loss before marketable carcase is neonatal loss.

37. There will be a theoretical maximum for on- farm production, for the system used. If production less than this then there is the opportunity for gain.

38. Suggest only 10% of farmers are recording fully.

Q2a Further Questions & Issues

1. Is there/ should there be a universal measure of production or loss?

Appendix 2b

The bullet points below are a record of all outputs collected in no particular order. Please note that some have been amalgamated because of similarity. Each star (*) represents an endorsement by a delegate. The original records collected at the conference on 29/07/16 have been retained at APHA Carmarthen VIC.

Q2b. In the last 5 years or so what are the main changes you have seen that affect extensively managed cattle and sheep?

Q2b Responses

1. **Value of stock.
2. ***Time pressure.
3. More off farm work being done to support farm income. So reduced time for livestock, fewer skilled stockmen.
4. ****Prices and income. Milk prices lamb prices and wool prices down but commodity costs rising.
5. Reduced stocking density.
6. Land abandonment – not taking on tenancy.
7. Less sheep being collected by fallen stock.
8. Awareness of surveillance and a wish to see surveillance data coordinated - farmer communication.
9. Increased tick diseases as a result of unmanaged land.
10. Farmers older, younger generation not coming in (Dartmoor, but other areas similar).
11. Youth and enthusiasm – younger generation more business focused.
12. Glastir (Welsh Government's sustainable land management scheme) – regulations and reduced sheep numbers- reducing farmer skills.
13. ****Environmental payments- less land is 'farmed' environmentally managed as well as farmed – stewardship scheme, increased forested land, increased predators – inability instigate control measures.
14. ****Fewer hardy breeds adapted to the hill environment grazing – vegetation less well controlled, reduced forage quality, heavier breeds need more input,- more going to tack grazing loss of hefting instinct.
15. Tack grazing – biosecurity and bringing back sheep scab and ticks etc.
16. Impact of eco-tourism.
17. *Change to funding of agricultural schemes – not direct funding for farming. Increased reliance on subsidy.
18. Stock units not breeding – used as land management not as production.
19. Beef from the dairy herd.
20. Cattle: more native breeds being used; move away from heavy continental as breeding stock.
21. BVD control Scotland, now England and soon Wales.

22. ***Increased use of genetics.

23. *Commodity prices.

24. ***Slow steady uptake of technology e.g. EBVs (Estimated Breeding Values) being used for sire selection.

25. **Technology is becoming more practical for the agricultural setting. Collars, smart phones, EID phone and internet coverage.

26. Technology increasing the attractiveness of the industry to young people.

27. More potential for dairy herds to move to beef.

28. Consumers more aware of where there meat is coming from – social media.

29. More recognition of the importance of extensive systems – public perception extensive is better – like to see managed landscape and grazing stock.

30. Improvement in handling facilities on farm.

31. **Last 5 years has seen little holistic approach to TB control e.g. wildlife reservoir populations.

32. Pre-movement testing.

33. Consolidation giving rise to fewer larger herds.

34. ********Sheep identification improved traceability.

35. BTV (Blue tongue virus) and SBV (Schmallenberg virus).

36. *****Anthelmintic resistance in nematodes and triclabendazole resistance in liver fluke, decreased indiscriminate use as a result.

37. AMR (antimicrobial resistance) - do we know the extent to which this is applicable to extensive systems?

38. *Changes in antibiotic usage – need evidence based data.

39. Fluctuation in organic production post FMD (Foot and Mouth Disease).

40. *Loss of expertise in PVS (private veterinary surgeons) for the farm animal and extensive managed livestock areas. Fewer graduates with this kind of experience/staying in this kind of vet practice.

41. Sheep worrying – 1 case cost £7000 before lambing.

42. **Brexit.

43. Testing capability – fewer tests available for some things (*Anaplasma* sp).

44. **Increased testing capability for other conditions e.g. sheep scab ELISA blood test.

45. ******Reduced number of government labs – where will new generation of vet path/virology/bacteriology going to come from.

46. Small post mortem examination facilities being developed, some associated with fallen stock centres.

47. Environment. – Increased rainfall reduced productivity of lambs and increased lameness, joint ill. Widespread fluke habitat.

48. Niche market development, marketing is changing the breed selection.

49. Changes to commons land regulations and how animals move.