

- 1 Supplementary Material for Review
- 2
- 3 Appendix A. Interview guides.
- 4 Farmers:
- 5

Recording medicine use:	<p>types of information recorded;</p> <p>methods of recording</p> <p>what proved difficult / impossible to record;</p> <p>POM-VPS recording</p> <p>searchable</p> <p>Time spent recording;</p> <p>business benefits of recording;</p> <p>personal satisfaction benefits;</p>
National recording and benchmarking	<p>Metrics</p> <p>Benchmarking</p>
Number of medicine sources	<p>Relationship with supplier</p> <p>Prescribed or sold</p> <p>Reasons for multiple sources</p> <p>Do each know of the other's involvement in managing farm stock health</p> <p>Do you declare all in the medicine record book?</p>
Demographic, geographic, and educational information, continued development / training.	<p>Education, agricultural, other.</p> <p>Recent antimicrobial training – MilkSure, CAFRE, local vet</p> <p>FQAS, UFU, NSA</p>
Medicine use	What when why how

	Health plan's influence
National initiatives; future direction	Existing Feared Hoped for

6

7

8 Veterinarians:

9

Protocol for sales,	Agreed plans on file Generalised dispensing guide for lay staff Questioning reason for medicine request Follow-up diagnostic / preventative Requests presented over the counter to a person other than a qualified prescriber Farm stock level knowledge
Different approaches for specific antibacterials & indications / uses,	Critical antibiotics Oral products for neonatal lambs; Antibiotic injection for abortion, Soluble powder for footbath
Understanding & interpretation of RCVS / VMD etc. guidelines	Under care Competence for safe use Questions that should be asked
Role of / place for national treatment guidelines	SCOPs Lameness 5PP BSAVA equivalent
Personal and practice/business level involvement in national training schemes	MilkSure, Farm Vet Champions Your knowledge?
Beliefs about farmers knowledge when requesting drugs	
Services offered, uptake	On farm
Belief and frustrations about (in)ability to influence farmer behaviour	Carrots and sticks

National initiatives; future direction	Existing Feared Hoped for
Spectam – did you see an effect?	

10

11 One follow-up question was sent by email to participating veterinary surgeons with a brief  
 12 introduction to explain the request and a reassurance that the confidentiality of the participants  
 13 would be respected.

14

15 **When interviewing and participating in discussion groups, little mention was made by**  
 16 **vets of corticosteroid use in sheep but when I reviewed the farmer supplied medicine**  
 17 **records, they appear in half of these record. Why are these drugs prescribed, or are**  
 18 **they requested by farmers? As ever, anything you say will be confidential and**  
 19 **anonymised before reporting in my thesis and other outputs. Also, happy to have a chat**  
 20 **on the 'phone / zoom if you prefer.**

21

22 **Paul.**

23 Appendix B. Discussion groups

24

25 Farmers:

Introduction: FLOCK AND FARM	Around the table briefly introducing one another and the farms and flocks we manage	Location  Area farmed  Type of ground  Size and structure of flock  Other enterprises	10 minutes
Discussion one: Problems and priorities	Around the table list flock health related problem  Then prioritise these as a group	No guidance, hints given at this stage	10 minutes
	Consider has everything been addressed including the non-clinical threats	Prompt if necessary  - Access to vet services, economics, labour, 'iceberg' diseases, unpick vague concepts such as bio-security if raised	10 minutes
Discussion two: Possibilities and solutions	A: What have you tried and what have you not tried, why?	Work down the problem list  Asking about practicality, sustainability etc of the solution elements	20 minutes
	B: What are there no solutions for? What is needed 'blue sky'.	In particular focusing in on any areas that it is felt there is no practical solution	10 minutes
Discussion three:	Lack of data	Response & potential mitigation / solution(s)	20 minutes

Others say this is a problem	Lack of control on medicine availability / multiple sources of medication Unwillingness to ask / pay for advice proactively	Potentially these may have been addressed already	
Concluding comments	Ask for any further important suggestions		10 minutes
[intentionally blank to note issues arising during discussion]			

27 Veterinarians:

28 Thank for help in interviews, recruiting farmers and supplying records

29

30 Highlights of research to date:

31 Medicine use – patterns, low v high, prescribing patterns, treat rather than prevent, lameness

32 ongoing issues, pockets of progress, metrics

33

34 Flock health plans or flock health planning?

35

36 Questions / discussion points:

37     • Resources – vets, impact of part-time farming, to deliver flock health planning and

38         prescribing, testing and prescribing of anthelmintics

39     • Resources – IT to manage prescribing

40     • One-farm-one-vet? or

41     • Central prescription register or

42     • what?

43

44 Unlicensed drugs – recurrent sales

45

46 Successes: transition to vaccine over antibiotic for abortion, pain-relief

47

48

49 Farming representatives:

50

51 Thank you for agreeing to host and facilitate a Zoom for my PhD with some of your colleagues.

52

53 Agenda is short:

54

55 1. I present findings

56 2. We discuss next steps for the industry

57

58 In slightly more words and to give a little context and background:

59

60 I plan to highlight research findings to date around:

61

- medicine use

62

- lack of oversight in medicine (antibiotic) supply

63

- flock health planning

64

- FQAS – opinions of and behaviour relating to inspections and record keeping

65

- medicine recording on-farm use

66

- impact of (non-disclosure of) sourcing medicines from multi-vet practice

67

- perceived lack of incentives in sector to progress

68

- ongoing lameness problem, low awareness of control plans or even causes

69

- gaps in research base

70

- and from a positive standpoint:

71

- reduction in antibiotic for abortion already achieved and

72

- the world carried on when Spectam disappeared - showing the industry can respond

73

positively to animal health messages

74

- Any other bits you think I should be asking questions about but have not done so to date

75

76 Seek feedback on what industry might think are appropriate ways to progress any of these areas

77 (these following options are not my recommendations at this point but are options that have been

78 raised by others and or are in use elsewhere)

79

80

- 1 farmer 1 vet



- 81
- improved medicine recording [currently a statutory requirement for all, not just a FQAS
- 82
- standard, but not enforced to any degree]
- 83
- improving oversight of prescription of medication (antibiotic)
- 84
- prescription register [which any certifying vet would have access to a record of all
- 85
- medicine purchased]
- 86
- test results required to prescribe anthelmintics
- 87
- future farm support tied to participation in schemes; Southern ewe premium, English
- 88
- Pathway, Scottish... not got a name yet but one suggestion is payment linked to data-
- 89
- recording, discussion and knowledge exchange events.
- 90
- Where do BDGs (or their successor) sit in all this?
- 91
- Incentivising and resourcing farmers – doing this without ignoring the ones who have
- 92
- already taken steps to improve
- 93
- diagnostic testing facilities
- 94
- Improved screening of livestock entering marts
- 95
- 96
- Any other thing you guys want me to consider
- 97
- 98
- 99

100 Appendix C

101

102 Additional exemplar quotes.

103

104 Sourced from questionnaire:

105 Other comments on the preventative care of the flock.

106 S17: Lame sheep treated when penned. Only inject bad cases of footrot.

107 S11: Heptavac P and Levafas diamond when the store lambs are purchased.

108 spray and trim feet

109 S32: We have dung sampled in conjunction with a PhD student and vet practice in the  
110 past it is not a routine. We use foot bathing for lameness only a percentage of lame sheep  
111 will get antibiotic if foot bath doesn't succeed.

112 S23: Regular footbath use helps minimise problems

113

114 Sourced from interview and discussion group comments

115 The plan: A physical document; a checklist

116 V14: Normally, we just go through the FQAS-NI template and most of the farmers know  
117 what they are doing. They have it fairly well planned out.

118 SF61: You go along and get the veterinary surgeon to write out a rough health plan and  
119 that is it. Nothing too major about it. For the revisions, it is not a 2 hour sit down being  
120 asked why do you do this or why didn't you do that or whatever. It is fill out the sheet and  
121 that is it to be truthful.

122 SF41: There is a wee bit of conversation with the vet at the review, but it is probably  
123 more just to get it signed.

124 SF42: Well, it hasn't physically been updated.

125 DGF09: If you don't dose for fluke, you have fluke or vaccinate sheep you have clostridial  
126 disease. But I had been doing these things for 20 years before I had a flock plan.

127

128 Positive comments on the FHP

129 SF41: I'd say probably just more looking more into lameness of sheep more than anything  
130 else. Thankfully we don't have many problems, it is just the lameness, trying to cut it out.

131 SF42: In 2017 I was probably injecting Terramycin [oxytetracycline 200mg/ml-1 solution  
132 for injection, Zoetis.] in all ewes in the run up to lambing at that time. Now, toxo,  
133 everything is vaccinated for toxoplasma now.

134

135 No written plan; it is all in my head:

136 SF63: There wouldn't really be a health plan to be honest. I suppose it's all in my head, if  
137 that makes sense. We know what time of the year we are doing what and what way, and  
138 maybe it would be a good idea again going forward, maybe it is something we should sit  
139 down and actually put together. Just every year we know lambing time comes around. You  
140 are going to be doing this before lambing time. Before Christmas comes around, we want  
141 to get everything its fluke dose, we want to try and change the drench we are using all the  
142 time, we know that everything gets the Heptavac P [multivalent clostridial and pneumonia  
143 vaccine, MSD] booster before it goes to the ram.

144

145 Awareness an FHP may confer benefits

146 SF29: I would be interested in sitting down at the start of the year and saying 'Right. This  
147 is what we need to do here.' Providing it didn't run me, the farmer, into a lot of extra  
148 expense through medicines and so on. But sometimes prevention is better than cure.

149

150 Veterinarian's viewpoint

151 V17: It depends on the name on the top of the FHP - this guy will be open for a  
152 conversation here and I will take the opportunity to do that. Some other guys you know,  
153 no, it is just, it is a bit of a form-filling exercise for him. However, it is surprising, some, a  
154 lot, of guys will take on what you say sometimes.

155 V18: They were happy to have it and that's nearly it, if you know what I mean. They are  
156 not really changing their management, and that's their health plan. They have that filed  
157 away and that's their health plan for ever.

158 V02: A lot of farmers just want to come in and hand you the piece of paper and walk away  
159 with it [signed], without doing all the paperwork. They don't really want you out on the  
160 farm to discuss it or go through things. We have some farmers who think they should be  
161 able to walk in and throw us their farm quality assured medicine book and have us fill the  
162 whole thing in for them from our records, in addition to our annual review of their

163 antibiotic use. There are a lot of our sheep farmers where we're not even ever on their  
164 farms. If a farmer can spend time with you, and you can have a good chat about things,  
165 and see the flock with your own eyes, and see their facilities, it would make a big  
166 difference and would probably make them pay a lot more attention.  
167 V20: The farmers that keep cattle and sheep, it would be whenever you talk about  
168 problems during the annual review, they rarely ever bring up sheep. They seem to think it  
169 is only cattle the conversation is about.

170

#### 171 Incentivisation

172 SF38: I withdrew from the Farm quality assurance scheme, because you had to go on a  
173 [antibiotic awareness] course. I was booked to do it, but that would not satisfy him,  
174 despite the girl in the office managing the courses telling me it was OK. So, that was it – I  
175 told him to leave and that he wouldn't be welcome back in my yard. It was no longer  
176 worth anything to me. Previously I had been getting a pound a head bonus, but not  
177 anymore.

178 SF72: I used to be quality assured. But I was seeing no financial benefit because my  
179 lambs are all going for export. My lambs are weighed live at the collection centre and I am  
180 paid for them there and then and that is it. So, I seem no advantage to being in a quality  
181 scheme.

182

#### 183 Advisory visits

184 SF62: You would be constantly consulting with the vet you know, the like of visits for if  
185 they are out on a visit for lambing difficulty.

186 DGF06: There is limited access to vets with an interest in sheep. But in general, we feel  
187 we can get a vet for advice if needed.

188 DGF13: I use two vets. One a traditional local practice and one purely ambulatory setup  
189 that covers the whole country. One doesn't want to know anything about sheep  
190 [diagnostics, testing etc.] the other advises me to send samples to the lab.

191 DG13: The practice I am with are good, but the boss is under pressure. It is down to  
192 inadequate staffing.