

TOP FARMERS **KNOW-HOW** AUDIO SALMONELLA IN SHEEP



TRANSCRIPT

Intro: This is Top Farmers' Know-How, brought to you by MSD Animal Health.

AMANDA: On the Tuesday after a holiday weekend, back in the summer of 2012, Stu Bruere's phone rang. Stu works as a vet in the Wairarapa, and one of his farming clients was on the other end of the line.

STU: The farmer rang me at about 4 o'clock on the Tuesday afternoon after Anniversary Weekend. I remember all of those sort of details because that's what happens with these things. The guy I've known for over 30 years. He'd been on holiday, and he got back from holiday. He had turned his two-tooths out to the back of the farm which was about 6km away from the woolshed and hadn't seen them for 10 days. [He] got back and he found about 20 of them dead in the paddock. Now this guy is a good farmer, so he was pretty upset about that.

AMANDA: Stu had 30 years of experience as a rural vet, so he suspected which disease he was dealing with straightaway: A preventable yet all-too-common outbreak of salmonella

STU: I went out and did a couple of autopsies, saw the dead sheep, saw the emotion in this guy's face because he was really pretty knocked back by it. He was uncertain about how this was going to turn out for him. The autopsy diagnosis of enteric salmonellosis is usually fairly straightforward, but of course, we take samples and confirm that, which we did.

AMANDA: Once they knew what they were dealing with Stu and the farmer needed to decide what to do next. And put plans in place to prevent this happening again.

Hi and welcome to Top Farmers Know How audio edition bringing know-how worth having straight to your ears. I am Amanda Kilby a technical vet working for MSD Animal Health. Today I am sitting down with Stu and with one of my co-workers, Kim Kelly, to talk about managing Salmonella in sheep. Could you each tell us a little more about yourselves?

STU: Ok, well my name is Stuart Bruere I'm a production animal veterinarian. I work in the Wairarapa. I have worked there since 1983, and like living in a semi-rural environment.

KIM: My name is Kim Kelly and I am the technical advisor for MSD Animal Health my area is the lower South Island, and I have been with MSD for ten years now. I like the talking with farmers that I do on a daily basis.

AMANDA: Great, thanks for that. So Stu, so can you tell us what is Salmonella?

STU: Ok, well the Salmonella that I deal with mainly is one called Salmonella Hindmarsh. And it's a bacterial disease. Normally you have carrier ewes in a flock that when they get under stress the bacteria proliferate in the gut and then they pass it out in their faeces onto the pasture and other sheep become infected through the oral route (or they eat pasture that is contaminated). That's essentially what you are talking about.

AMANDA: So when and under what circumstances do you usually see outbreaks in the Wairarapa?

STU: Usually there's a few things that all line up before you'll get an outbreak of Salmonella. It is what I call a 'disease of kindness.' So you never see it in thin, poorly-doing sheep. It's always sheep that are fat. So usually it happens on good farms where the sheep are well fed. Usually it's associated with some management event which has occurred anywhere between 7 and 14 days prior to the outbreak starting. So often sheep may have been in for shearing, might have been in for vaccinating or drenching, and they have been held around the yards for too long and that changes the gut microflora and so then you end up getting a proliferation of these Salmonella in the gut and the disease process starts at that point.

TRANSCRIPT

AMANDA: Ok, so can you talk us through the various options a farmer would have in that situation and what you decided to do in the outbreak you described to us earlier?

STU: Because I have dealt with this disease a lot in the past, I was quite confident that if he vaccinated and if he spread the sheep out that the disease process would stop, that he would stop seeing the deaths, and that's how it turned out. In the Wairarapa, we see Salmonellosis anywhere from mid-December through to about mid-July each year. So, at that stage, the farmers are starting to get the ewes prepared to go to the ram usually in March or April and previous experience has taught me that about the worst thing you can get is to get an outbreak in the middle of mating. So, as it was the end of January, I pointed all that sort of thing out to him and said that "you've got time to put in a good vaccination programme here and stop this disease and stop it impacting your mating programme." So he was pretty easy to talk into doing that. And most farmers are.

AMANDA: And would you always recommend vaccinating? Do either of you have situations where vaccinating might not be the best option?

KIM: From the part of the country that I live in where we have a lot of Brandenburg in sheep there is big issues with vaccinating ewes in the face of an outbreak, late in pregnancy. So what happens with what Stu talked earlier, about spreading sheep out and reducing the amount of contact they have with each other, well if you are going to bring them in the yards to vaccinate them you are going to cause stress and bring them in close contact with each other. So, I would normally not recommend it in the face of an outbreak of abortion. However, in some cases some farmers will still do that if they are going to have to have them in for something else. In general, I would say no. If it's abortion and it's Brandenburg and it's late in pregnancy, spread them out. Don't bring them in and vaccinate.

AMANDA: So, the Brandenburg Salmonella outbreaks you have been describing which as of this recording only occur on the South Island, how do they compare with the "enteric" or the gut-affecting salmonella which Stu has been talking about?

KIM: A lot of it is the same, so it's still Salmonella bacteria. Still, as Stu said, it can be in carrier animals, and when they are under some stress, and unfortunately, it is often associated with late pregnancy, which is a reasonably stressful event in itself, or shearing, or yarding, or a snow storm (which we get quite a few of down south), and so that means that it puts the sheep under more stress. And the nasty thing about Brandenburg is that they will actually get sick as well, so if they can't get the foetus out, those sheep will generally die pretty quickly.

AMANDA: So Brandenburg outbreaks tend to affect ewes at the end of pregnancy and cause abortions, whereas 'enteric' (which is a scientific term that means it affects the gut), those outbreaks tend to happen in summer and autumn, and even into early winter.

AMANDA: So Kim, if a farm gets Salmonella Brandenburg what impact might they see?

KIM: It depends on the farm, but quite often you will find over a period of around a month you will have, in some cases, up to 5% of the flock will abort and probably half of those (this is in unvaccinated), probably half of those might die. Now that's an average, like, we could have all those ewes dying or we could have 10%. Now there are these extreme outbreaks with 20% of the ewes and 10% of them dying. I have a farmer I know who had 400 ewes; now getting rid of 400 dead ewes is not a simple task and one he will never forget. That was one of the first farmers who got it. So if you start to look at the extent of it, unlike the enteric which can trickle on for a wee while, in general you will have a real bang outbreak at the start and then it will trickle along during lambing but once the ewes full on start lambing at speed, the outbreak will go away, so to speak.

AMANDA: And Stu, how about for you what is the course of an outbreak in your practice area?

STU: Those deaths have sometime trickled on for months. So when they have added up the number of losses for the season they could have lost anywhere between 200-300 ewes out of a 4,000 ewe flock. So that is why I am quite keen that people vaccinate when they first notice a problem. Or better still, vaccinate to prevent the problem in the first place.

AMANDA: So we've talked through the option to either not vaccinate through spreading them out in the case of Brandenburg outbreaks that tends to be the way to go. In enteric outbreaks it usually makes sense for people to get in and vaccinate. So what would be the timings of your vaccination programme in that case?

TRANSCRIPT

STU: The smart farmers actually do preventative vaccination so in mid-December a good number of them are vaccinating their two-tooth ewes coming into the breeding flock and they will then give them a booster vaccination in 4 to 6 weeks' time. The mixed age ewes generally have a booster and then that will give them protection across the whole risk season. And that's the programme that we recommend, and it seems to work very well.

AMANDA: Kim can you explain why it's important that people follow a vaccination programme like Stu's just described, where they give two shots in the first year and an annual booster?

KIM: So the initial course of a sensitiser and a booster for all killed vaccines is the same, in that we need one shot which will give the immune system a little bit of a sniff of what is actually there. There will be a little bit of a delay but it will come along and go "that's something foreign, I don't know what that is...I'm going to come along and make some antibodies." The problem though is of you only do that one shot it's a low level of antibodies and there is a delay and it doesn't last very long. So, we come in with the booster, 4-6 weeks later, and the immune system will be ready. They will recognise it they will produce a high level of antibodies very quickly then they will stay high for less than 12 months, they will slowly decrease. So we want the challenge of the risk period to be when those antibodies are as high as they possibly could be hence the do it at least 2 weeks before the risk period. And then we need to do an annual booster to make sure those antibodies stay high in subsequent seasons.

And I know historically some people have given one-shot and hope. What would be your advice to those people

STU: Give them a booster vaccination, as your prayers are eventually going to be unanswered. And you are going to have a disaster on your hands.

AMANDA: So what is the thinking do you think behind the one shot and see?

STU: It's an old old theory going back 50 to 60 years where sheep farming was probably more extensive and sheep weren't as well fed, and people were lucky, I guess. But we've had a number of farms in the Wairarapa that were doing that under really good feeding regimes and it simply doesn't work. It's a failure most of the time.

AMANDA: So we're wanting two shots in the first year the first time animals see it and that second shot of the initial series needs to be prior to the risk period.

STU: Correct

AMANDA: ...for prevention and then an annual booster after that.

STU: Correct.

AMANDA: Kim can you talk about the vaccine itself? So we both work for MSD Animal Health, the company that makes Salvexin+B, which is the salmonella vaccine available for sheep and cattle in New Zealand. Can you tell us about that vaccine? What's in it and how it works?

KIM: So Salvexin+B contains Brandenburg, it contains Hindmarsh, it contains two others, one called Bovismorbificans and one called Typhimurium, so by using a vaccination preventative programme with Salvexin+B, you are protecting against the enteric form and the abortive form.

AMANDA: And what's the history of the vaccine?

KIM: So Salvexin (without the +B) just Salvexin has been on the market for a long time and then in 1998 and 1999 the wheels fell off in Southland with, effectively, the whole population of sheep in that area were naïve to Brandenburg and somehow it got into the sheep population and what happened was we had a massive outbreak. At that time, through some miracle of science, they discovered it was Brandenburg so it was a strain that wasn't in the vaccine. So they managed to, really quickly, within almost 12 months, they managed to get Brandenburg added into the standard Salvexin, and Salvexin+B was born. So, looking back now that was amazing that it happened so quickly, and it was a good collaboration of the labs, the scientists and the company to get that in as quick as possible. So for the first 5 to 10 years after it was so horrific on their farms, the vaccine was extensively used during that time. Interestingly, the enteric salmonella disappeared from the lower part of the South Island. So, when it reappeared, when vaccination rates dropped from 2007 onwards, then people thought it was a new disease. But it wasn't, it was just enteric salmonella coming back again. Now there is probably equal number of both so there is enteric disease out there and some very unlucky farms down south get enteric as well as abortion in the same season so vaccination procedure down south is not quite as simple as it is for Stu in that you need to work out where your risk period is. And quite often that risk period is basically about the whole year, so it's 12 months, which makes it difficult.

TRANSCRIPT

AMANDA: Ok individually sick animals, say if someone had a pet sheep or a small flock or a stud where they need to be aggressively treating every individual sick animal. Is that possible with Salmonella, what kinds of treatments would you guys recommend as vets? If someone wanted to treat sick animals? And do they work?

KIM: If the sheep are aborting or have aborted and are looking like they will stay alive some people will go in with an antibiotic then. But if, for example, you have a pet sheep who has Salmonella and you are worried, you are not going to stop her aborting by giving, unfortunately, by giving her antibiotics, it's not going to happen. So, she is still going to abort. You may manage to keep her alive but often there are some dead before you even diagnose.

STU: So in the case of enteric salmonellosis, the diagnosis to death is quite quick. If you find a sick sheep they are usually dead within 24 hours so you don't actually find many sick ones that you can treat.

AMANDA: So that's how you diagnose the disease, there is heaps of dead sheep, just like the story you were telling us.

STU: The diagnosis is based around history and doing an autopsy and there are some very classic autopsy symptoms. I always get it checked with the lab because I think that's important that we don't make assumptions because sometimes you are wrong. And I have had a case where I thought it was Salmonella and it took 6 autopsies and actually, it was black disease.

AMANDA: Ok interesting. So far we've talked about how outbreaks play out, but what is their impact on the farming business itself?

STU: OK. In terms of modelling the impact of the costs of Salmonellosis in a 4,000 ewe flock, I have actually done some modelling here and I have made some assumptions that in an outbreak you can get losses anywhere between 1 and 5% of the ewes. So, 4,000 ewes, that's between 40 and 200 ewes are going to die. And if you make an assumption of \$180 per ewe, which, going on current pricing is about right... those deaths are going to cost you anywhere between \$7,200 and \$36,000 dollars. But also, the loss which most people don't make an account for, is the potential loss of lambs. So, let's assume that the farm is lambing at a modest 135% and that they are going to sell the lambs at an average \$100. Losing those 40 ewes at 1% means that you are going to have 54 less lambs to sell, so that's \$5,400 dollars of lost lamb sales. If you are very unlucky and get a 200 ewe death rate out of the 4,000 ewes you have 270 lambs less to sell so that's \$27,000 dollars. So if you put those costs together an outbreak could cost you anywhere between \$12,600 dollars and \$38,700 dollars. So that's the reality of what an outbreak could cost you.

AMANDA: And those are just the direct costs, right?

STU: Correct. So, when you vaccinate ewes against Salmonella you pretty much always get a small temperature rise so their normal temperature may go from 38 to 39.5 something like that, so that's a stress event, and you're vaccinating during mating. The other factor to think about is if you have a Salmonella outbreak in the late mating period or soon after you take the rams out, so in the Wairarapa that would be somewhere in the May time of the year and you've got to spread out ewes for 10 days at that time of the year you will burn up a lot of your winter feed so let's assume the average ewe at that time of the year is going to be allocated 1.3kg of dry matter per day. If you spread the ewes out, you are basically going to ad lib, and so let's assume each of those ewes is going to eat at least 2kg of DM per day for 10 days and they will. They'll do it. You may not notice it at that point, but you will actually notice it in August, which is the toughest month for feed budgets. It means you have actually got to find another 2,800 kgs of dry matter each day in August that you had saved that has disappeared. So and that's added to the fact that at that stage of the year the feed demand because the ewe is heavily pregnant has risen to around 2.3 kg DM per day. So you can see in that sort of example how costly an outbreak can be and you can put your own price on dry matter values but different people will talk about it being anywhere between 15 and 30 cents a kilo.

AMANDA: You think of the spread out and wait option as being the low-cost option, but those figures you've just walked us through show how costly it can be to have find feed when you are not expecting to.

AMANDA: Kim can you talk through how people can protect themselves when there is salmonella around?

KIM: So when I talked about in the late 90's when Brandenburg appeared down south people were assisting these ewes to get the lambs out and then it started to spiral and some of the vets and farmers both got sick themselves. So for assisting ewes who we think are aborting with Brandenburg then absolutely—shoulder length gloves, plastic disposable ones are an absolute requirement. And thinking about people

TRANSCRIPT

who are more immune compromised, so don't let your children go and help you and pull out these dead rotten lambs, it's not going to be a very good idea. And if you can, the material that you are going to be collecting, like the aborted foetus and afterbirth and stuff, if that gets buried or put somewhere that people can't touch it. And obviously it's a contamination effect as well, so if you have a paddock where you go into and you find ten ewes that have aborted and there is aborted material placenta and those ewes, the ideal thing to do is to move the rest of the mob away from that contamination. So moving them onto a new area where they can be spread out. Use gloves to handle anything, and also disinfectants (most disinfectants) will kill Salmonella—it's a bacteria, it's reasonably easy to kill. So that will protect you and your family, which is really important. There has been cases of lots of, a whole family, getting Brandenburg. And it's really nasty to have to look after your family and your sheep when you have Brandenburg yourself.

STU: Do you recommend that farmers go around picking all that up because of the risk of birds picking it up and spreading it?

KIM: Yeah. So if the farmers then remove all that contaminated material and can bury it that would be ideal, not just throw it into an open offal pit, but actually bury it, so that the seagulls can't come along pick it up and carry it into the next paddock or into the neighbour's paddock, which they do. And they are very attractive for them to eat. They love to pick them up and eat them. And even your farm dogs can get Salmonella too, so you don't want your farm dog going over and picking it up and taking it away.

The bacteria can survive for a long time in the dust in sheep yards, they have found it for over 6 months, that would be in perfect conditions. There is no sunlight and there is a little bit of damp in there. The bacteria is very susceptible to drying out and sunlight, so heat, and also frosts it also doesn't like very much. But within a normal paddock where animals have been grazing, it is unlikely it would still be there for any longer than a couple of weeks.

AMANDA: But it would continue to be shed out in the carrier animals' faeces?

KIM: Correct, for at least, and they have measured that, for over 6 months as well. So it can probably nearly go between seasons, but no one has confirmed that's the case.

AMANDA: And I guess that's my next question. Is it possible to get rid of Salmonella on a farm that has it?

KIM: Probably not. It's probably always going to be there. What you notice down south is the farms who have had the Brandenburg with the abortion is a really cyclical nature. On average the ewes are on the farm for maybe 5-7 years from when they come in as a lamb to when they leave as an old ewe. And you will see the peak in Salmonella cases cycles in around about a 5-7 year pattern and that's because the immunity of the flock as a whole, while there is an outbreak, increases and then it will decrease once those animals that have ever been exposed goes away. But it doesn't go away completely, so it's still going to be there.

AMANDA: So you will see outbreaks happening every 5-7 years

On individual farms they might have a really bad outbreak and then seven years later they might have a really bad one again, just because natural immunity has gone down. That's assuming they have chosen not to vaccinate.

STU: In the Wairarapa people have tried that and they have actually given up on relying on natural immunity, and they just think "no." Particularly the higher performing farmers have made a decision that's an investment decision each year that "we're just going to vaccinate because we just can't be bothered with this disease," because it's remarkably disruptive at key times of the year. Most farms are working, they are working really hard through the late summer-autumn period making sure that they optimise their opportunity to get a top lambing percentage and an event like this can really throw things into chaos. It's far simpler to know we have dealt with that and we don't have to worry about that and we can move on and go on holiday and not have to worry about it.

I think the other thing we have to talk about nowadays is the significant welfare issues. It's not a pleasant disease, either Brandenburg or Hindmarsh, and animals do suffer so we have to be mindful of that and make sure we do what we can to prevent that sort of animal suffering.

AMANDA: So in flocks that vaccinate does that mean they will never ever see a case of salmonella?

STU: Well in the case of enteric salmonellosis you can never say 100% but certainly in my observation in the Wairarapa since 1983 when they are vaccinated and they've followed the programme properly I can't say that I've seen some cases where it's broken down. The most unlucky one would be a guy that once had an outbreak at the end of January and then he started seeing cases again in December the following

TRANSCRIPT

season, so he's ridden through a season and it started, and it just occurred a little bit earlier for him the next time. So that was the unluckiest one.

I think the other thing to factor in to all of this as well is that when farmers do make the decision 'yes I am going to vaccinate' it's based around a decision that they actually want to absolve themselves of uncertainty and most of the time it's around the emotional cost.

AMANDA: Well thank you so much Stu and Kim for coming in to talk to me today about salmonella in sheep. I've really enjoyed it.

KIM: Thanks

STU: It's been a pleasure.

AMANDA: Salvexin+B is available only under veterinary authorisation. So, if you'd like more information about this vaccine or more generally about managing Salmonella in sheep, talk to your vet. You can also visit our website topfarmers.co.nz for a list of our references and a transcript of this podcast. Thanks for listening. Bye for now.

FOR MORE:

Visit TopFarmers.co.nz

Or find us on YouTube by searching: **TopFarmersNZ**

Or visit: **soundcloud.com/TopFarmers**

Or visit: **msd-animal-health.co.nz**

MSD Animal Health
33 Whakatiki St, Upper Hutt, Wellington, New Zealand
Private Bag 908, Upper Hutt 5140

AVAILABLE ONLY UNDER VETERINARY AUTHORISATION.
ACVM No: A007886. Schering-Plough Animal Health Ltd.
Phone: 0800 800 543. www.msd-animal-health.co.nz NZ/SALB/1019/0009(1)b

