## Title: Final Responsible use in dairy farms

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- So welcome everybody, to this webinar today on responsible use of antibiotics in the dairy herd as part of the Farm Vet Champions. Let me just quickly introduce RCVS Knowledge. So RCVS Knowledge's mission is to advance the quality of veterinary care for the benefit of animals, the public, and society. So today I'm really, really delighted to welcome Rachel Hayton. Rachel doesn't need an introduction to most people, I'm sure, as an advanced practitioner in cattle health and production. Rachel qualified from Edinburgh in 1993. She's worked in farm animal practise since then. She's been a BCVA board member since 2017, and her interests include mastitis control, sustainability, and leading the practise research programme. Thanks Rachel.

- Thank you very much, Fiona. So first of all, before I begin, I'd just like to thank BVCA board members who reviewed my presentation for me, and particularly to Kat Hart and Keith Cutler, who helped with some of the content, and RCVS Knowledge who reviewed it. So learning objectives for today, we're going to be looking at how to calculate and compare antibiotic usage for dairy farms. And then we're going to look at some of the key areas where there's really high risk of inappropriate use, and understand what we can do to ensure good practise. That will include looking at some key industry initiatives. There's not really time to go into each topic in detail, so there will be some signposting of initiatives. And hopefully at the end of it, everyone will feel able to sort of identify and implement some relevant goals for responsible antibiotic use at a practise level, and also at a personal level. So yes, this is a huge topic, and I haven't got long. This is basically an outline of some of the things we're going to be talking about today. I think it's really important to start off looking at what is responsible prescribing practise, and how to benchmark antibiotic use within our practises, because that starts so many of the conversations that we need to be having. And then we're going to look at particular issues around cow resilience, and then the big, big topics of mastitis and lameness. Finishing up with just a quick look at infectious disease, and then a discussion around farmer training.

So yeah, this is one of my sort of big areas that I think is really crucial in antibiotics stewardship, is looking at prescribing practise. Basically if we're handing out antibiotics with very little control, there's no way that we can be showing good antibiotic stewardship. So this starts with having a medicine ledger for each client, for each enterprise on the farm within the practise. And the staff members who are dispensing these medicines need to really understand what their role is, and what the procedure is. And it's very important that at no stage in that that they get undermined when they try to put those procedures into place. So communication is really important, and consistency. So the first question is, is there enough oversight to meet animals under our care criteria? So if the nominated vet for each farm has clearly written on the ledger what medicines are allowed to go out to that farm without further authorization, that's fine. And if further authorization is needed, it

needs to go to the right vet with enough knowledge of that farm to give a meaningful answer. And that needs there to be enough notice given of medicine order, so if we've got farmers to showing up at the practise expecting to be handed stuff straight away, that's going to put the whole system under pressure, and it's going to make it very difficult to fulfil those criteria. So it might be that we need to have a whole look at farmer expectations. There might be a need to reeducate vets, dispensing staff, and clients, and that can be quite a long, slow process.

It can be quite a challenging process to undertake, to change culture and expectations, but it's really worth doing. And it can be greatly undermined if you've got a practise down the road who is not taking such responsible action, but it's really worth trying to communicate the reasons for that. So I've mentioned that there should be medicine ledger for each client, and really, those medicine ledgers, what's on those ledgers, should be corresponding to treatment protocols that are set out in the health plan. So that every farmer understands the way that they're supposed to be using the medicines that they're being given. And it does need regular checks to make sure that those protocols are being followed, that they're appropriate, and that they're effective, that they're doing the job that the farmer needs them to do, and that the correct withdrawal periods are observed. So cascade use, in other words, using medicines not as described on the data sheet, should only be happening when advised by the vet. And it needs to be properly documented with the correct minimum statutory withdrawal periods applied. Just a reminder at this point, this tends to come up when we talk about cascade use particularly, but in many contexts, but if we're getting either adverse reactions or more commonly suspected lack of efficacy, we should be reporting that with the MD. And actually, if they're finding that we're consistently having to apply cascade protocols to get good therapeutic results, it's possible that we should be supporting that product as a suspected lack of efficacy. And if we actually do that on a regular basis, we're more likely to get licenced medicines that actually have realistic data sheets. So that was my little rant about responsible prescribing.

I think the next step for anyone wanting to sort of address antibiotic use within the practise would be to undertake regular benchmarking. So being able to calculate our clients' antibiotic use, and this is a fantastic way to start the conversation. It could be free farmer meetings. It could be feedback meetings. Obviously we're having to review medicine use and for health and performance of the herd health plan review every year. In the future there may be a requirement to do that more frequently. It might be that farmers are required to do it twice yearly, but actually there's a lot of benefit in doing it more frequently than that, particularly for some of these high risk areas. Again, in the future, there may also be an opportunity for us to provide a service for our clients entering medicine data for them into the Medicine Hub.

So what sort of things are we looking at and calculating when we benchmark antibiotic use? So we can compare, we can compare our farms. We can see who the highest users are, and that's automatically going to direct us to the people we need to be having conversations with, and who perhaps would benefit from more veterinary input. I put this in almost tongue in cheek, but it's quite an interesting thing to compare vets within a practise. There's always going to be reasons why vets have different use, it's not a right and wrong scenario, but anything that starts a conversation can be useful. And obviously we can compare use for our individual counts over time. So the graph at the bottom there is milking cow tube use and dry cow tube use for one particular client over three years. And that was compared with the column on the right, which was the practise average in the third year. So they could see how they progressed, say, if they were instigating preventative measures and whatnot.

The graph on the top right there is just looking at a group of benchmarking a group of farmers with each other. And so it can be seen that the average across the group is below the national average at the time, but there's still some individuals who are quite high users. So here's a few questions that can be answered by analysing our antibiotic use for the clients. Clients always like to know how they're doing compared with other farmers, and that can be done in an anonymous way. So you can show them how they're doing without necessarily telling them the identity of all the people that they're being compared with. They want to know how they're doing over time, and they particularly appreciate being compared to similar systems, such as organic or extensive grazing systems. But the graph on the right there, this is quite a nice illustration, that there is actually no particular correlation between yield and antibiotic use. So we get low users occurring across all years. Organic farms may have lower immune antibiotic use, and they're worth analysing as a group if there's enough of them to keep the anonymity there. I'm presenting this information in a neutral way to farmers. Really allows them to carry out their own interpretation and take ownership of addressing their antimicrobial use. So it's much better, much more likely to result in better motivation than just a directing approach. So we can look at which antibiotics have been used, what have they been used for, and carry on the conversation.

So this is just a quick introduction to the core metrics that we use. I don't want to sort of make this too complicated, but these are the metrics that are going to be generated, for instance, by the Medicine Hub. So important to know. Core metric one is the mg per kg of population collective unit. So that's the total weight of active antibiotic used on farm divided by the average number of dairy cows, times this average weight, which is 425 kilos. That's not assuming that an average cow weighs 425 kilos. That's taking an average figure for a weight of animal, taking into account all the adults, and all the young stock on the farm. That's generally going to be driven by high injectable use. The next core metric is the average number of courses of dry cow antibiotic per cow. That's much simpler to calculate. That's just the number of dry cow antibiotic tubes divided by four. And then the third metric is the average number of lactating cow antibiotic courses. And that's just the number of lactating cow tubes, and it's divided by three. So that's obviously an assumption about what the data sheet course is, it's not always correct, but that's the way that metric is calculated. So it's worth just having a think about how your practise is going to work out these metrics, and setting about it.

There are various tools that make this easier, so it might be possible to do it through the practise management system. It might be possible to do it just using generated spreadsheets from practise sales. This is the antimicrobial use calculator produced by the University of Nottingham, which makes it quite easy. You just have to input the sales to a particular farm. And this is a free tool, and it's found on the AHDB website. And another way in the future for generating this data might be through the Medicine Hub, which there's a variety of ways of inputting the data. It can be inputted by the farmer putting in purchase data. It can be inputted by the farmer used as a full medicine book, or the data can also be entered by the veterinary practise by allocating medicines that have been sold.

So this was a paper, a 2017 paper by Hyde et al that looked at antibiotic use on 350 dairy farms. And they were garnered from four different veterinary practises, and also those contributing to an electronic database. And it's quite interesting, because it shows the enormous range in use across those farms. So there's really low users, and there's really quite high users. Even though the median and the mean use was well below the national target at the time, it really highlights that there are some individual farms who could have made big improvements. And when they looked at that antibiotic use in more detail, it could be seen across the different classes of antibiotic. It could be seen that by far, the biggest contributor was injectable antibiotic, and this also showed the biggest

variation between farms. So that's probably, if we're going to make deductions in antibiotic use, that's probably one of the areas of biggest focus. However, in this study, which was a few years ago, antibiotic footbathing, when it occurred, could be quite a big contributor. This is no longer really considered acceptable practise in lactating cows. So that should have been phased out now. Intermammary tube use contributed relatively little to the overall use that was measured in mgs per PCU.

So the next thing I wanted to just talk about briefly, I'm going to talk about it briefly, but it's incredibly important, is cow resilience. Because I think we can talk about specifics. We can talk about areas where we need to reduce antibiotic use, but the most important thing underpinning all of that is to have a resilient cow. In short, have we got the right cows bred for the right system? And is their health being undermined in any way? So much injectable antibiotic use occurs during early lactation, and it's as a result of transitional issues. So milk fever, tent closings, excessive negative energy balance, fatty liver, LDAs. And this is, unfortunately, it's too big a topic to talk about today, but if we've got farms where these things are a really big issue, it's worth selecting them out, highlighting them, and looking at this in more detail. It's also worth setting targets for farms that would benefit from discussing breeding goals. So a good starting point, that would be herd genetic reports and looking at whether the breeding goal is appropriate, whether they're being achieved, whether more gains could be made that way.

So now I'm going to move on to some of the sort of really big, big topics that can contribute to antibiotic use on farm. So, first one is mastitis. Obviously that is contributing to the average number of lactating cow antibiotic courses. And that would be through the clinical mastitis rate. So the number of cases, but it can also be contributed to through over treatment, so we do see quite frequently farms that are using very long treatment courses per case of clinical mastitis. And then it's also contributing through injectable use. And that could be through systemic treatment of toxic mastitis cases, or it could be through combination therapy. So using injectable antibiotic for mild cases, which, it could be argued, is probably an unnecessary use of systemic antibiotic, or certainly in certain cases. So how do we reduce antibiotic use for clinical mastitis? There's basically three approaches. We can either prevent the mastitis in the first place. We could look at using less antibiotics per case. And obviously we could also think about treating fewer cases. So the graph at the bottom there, actually that was an average number of courses of intermammary antibiotic across a discussion group. So each bar there is referring to one individual farm, and obviously the farmer on the left was interested to find that he was quite out from the rest of the group. And that really sort of caused him to look at what was feeding into that, and to take measures to bring down his mastitis treatment levels.

So the first and the most obvious area is mastitis prevention. So if we're going to prevent mastitis, we need to know where it's coming from. So, is it contagious? Is it coming from the environment? If it's coming from the environment, is it dry period origin, or is it lactation origin? If we know where it's coming from, then we can look at the risk factors. So we can look at milking routines, the environment for milking cows, the environment for dry cows, calving management. And then we can apply those two pieces of information to applying the right control measures for that farm. So the best and the most thorough, evidence-based way of doing that would be the AHDB Mastitis Control Plan, which combines that sort of making a diagnosis with the farm risk assessment to create a prioritised control plan. And in order to carry that out, it requires planned deliverer training. So a really good first step would be to get a vet in the practise trained up as a mastitis control plan deliverer. But that's not the only approach. And actually, even if you've got vets who are trained up as mastitis control plan deliverers, often they will be applying that approach in more targeted ways.

So without necessarily always carrying out a Mastitis Control Plan. But it's a really thorough, and it's an evidence-based approach to mastitis control.

So in order to make that diagnosis, we need data. We need clinical mastitis data, and we need, if it's present, individual cow cell count data. And if the farmer is actually providing the milk reporting organisation with their clinical mastitis data, we can get all of that very simply and easily from the CDL file, which can be downloaded. It's really worth investing some time and energy into making sure that farmers do provide the milk recorder with that information. I think a lot of them don't initially see the benefit, but if we are carrying out mastitis analysis, it makes a huge difference, and it's really worth putting a bit of work into, to make sure our clients do that. The mastitis pattern analysis tool is another piece of free software that I'm going to give a plug for. It can be downloaded from the AHDB website. And if you input the CDL, information from the CDL, it will give you a diagnosis of mastitis on the farm. So then that helps you to look in the right places for the most important risk factors to address on any particular unit. This can then be combined with, there's also a lot of very good resources on the AHDB website, which apply to each of the main diagnoses. So there's one available for contagious mastitis, there's environmental lactational, environmental dry cow, and also a good one on heifer management. Quarter Pro is a sort of simplified approach. There's very shortly going to be some quite comprehensive training on the use of Quarter Pro available from the BCVA. And the rationale behind it is just this continuous cycle of review, so review the data, make a diagnosis, use your knowledge of the farm combined with resources, if necessary, to make recommendations for what are going to be the most effective control measures. Take action, come back three months later and have a look to see what's changed, and so on. So yeah, look out for the release of this training at the end of this month.

So that was prevention, which is definitely the most effective way of reducing antibiotic for mastitis. What about using less antibiotic per case? So it's really having a look at what is the average number of tubes per case on the farm. If it's very high, obviously it is possible that they're under recording clinical cases, but very often it's because long treatment courses have been carried out. So it's really important that farmers understand the data sheet protocol, and that that's the default option. That needs to be sort of written into the health plan and discussed. And if the treatment course needs to be repeated, then it's really important to ensure correct withdrawal periods are applied. So that would be, in most cases, a minimum of seven days milk, 28 days meat. And if we're habitually finding that data sheet courses are not affected, we need to consider reporting that as lack of efficacy. It's really debatable whether routine use of systemic antibiotics for mild mastitis cases is necessary, so that could be another way in which we could use less antibiotic per case. But above all, it's really important that we're monitoring cure rates, so that if we make a change, we can then report back on whether it had an adverse effect or not, or even a beneficial effect. Finally, the last way of reducing antibiotic use in mastitis, would be treating fewer cases. Now, this is definitely an approach to take after we've already addressed the first two approaches, and the rational way to do that would be using on farm culture. And it's really suitable only for certain farms under close veterinary supervision. But if we've got mastitis control measures in place, and we've got rational treatment protocols, and we've got the correct pattern of mastitis pathogens on that farm, it's a perfectly valid approach to carry out on the farm culture, and withhold treatment for the mild cases that have got gram-negative pathogens.

So now we're going to just mention dry cow therapy briefly. Obviously a few years ago, it would have been far more common than this because of antibiotic prophylaxis. So every cow was getting dry cow antibiotic. That would not be the case anymore. So now we think about the main aim of dry period antibiotics. This would be to cure existing subclinical infections, and actually for our low cell

count cows, for our uninfected cows, we're looking to prevent new infections using good hygiene, and internal teat sealants. So really there's no need to give antibiotic treatments to uninfected cows, and that's an obvious target for reducing antibiotic use where it's happening.

This is just, again, some graphs that are provided for a farmer discussion group. And they were able to compare their rates of teat sealant use, and their rates of dry cow antibiotic therapy. There's no right and wrong answers here. There are going to be different rates of treatments, but clearly there were some farmers there that aren't using any teat sealant at all. So that would be an interesting conversation to have. And there were some farmers using quite a lot of dry cow antibiotic as well. So again, conversation starters. So is it ever warranted to get every cow antibiotic dry cow therapy? So our basic rules on this would be, it should only be applied when animals are diagnosed at high risk of bacterial disease, and it shouldn't be applied routinely. So there may be temporary circumstances where it's warranted, but it shouldn't be used to prop up poor hygiene or inadequate husbandry.

So how to make selective dry cow therapy a success. Obviously the first step is to sit down with our clients and agree thresholds for detecting infected cows. I don't think there's a one size fits all for that. It would be determined by the bulk milk cell count. I think when you've got a high bulk milk cell count, then you probably want to have lower thresholds. Whether or not we've got individual cow cell count data, it's much harder to do when we haven't got milk recording. Have we got good clinical mastitis records? And you might want to take into account things like yield, dry off, use of teat scoring, CMT on the day of dry off, other factors. But the important thing is whatever thresholds we set, we need to set a monitoring system in place. So make sure that we're getting the cure rates that we want. And that way we're not getting too many new infections, and that the decision making is working as well. And I would also argue that it's absolutely vital to have practical drying off training. So when teat students were first introduced, and we got farmers applying internal teat sealants drying off with nothing else, there were some reports of really severe mastitis, clinical mastitis of drying off. And I think we should be really aiming to avoid that by being proactive and carrying out practical training. And it's worth probably having vet team meetings as well to ensure a consistent approach there.

Now I'm going to just move on to the next, really big topic that probably is responsible for a lot of antibiotic use, and that would be lameness. So lameness can be responsible for antibiotic use through, obviously, foul of foot. Then we've got topical treatments for active digital dermatitis. Possibly antibiotic for a thing that's not really appropriate for lactating cows. And then sometimes if we've got complicated claw horn lesions, or deep sepsis, and obviously if you have to carry out due to amputation. So the most obvious area really to focus on here would be when we've got inappropriate antibiotic treatment. So that would include antibiotic footbathing.

So question number one, if you're looking at this issue as a practise, are you still prescribing antibiotic powder for treating digital dermatitis? That's going to be a difficult area to address if the answer's yes, but it requires concerted effort. That likewise is injectable antibiotic being given the lesions, such as white line disease or uncomplicated solar ulcers. So this might require a little more investigation, because that might be something that's been carried out by farmers, but definitely an area where antibiotic use is not necessary. So the best treatment for claw horn lesions, as we've already said, is not antibiotic. It's going to be early detection. It's going to be corrective trimming, a block, and a non-steroidal injection. So I suppose the first question that we should be asking is, who's carrying out the early detection of lameness? Have we trained our farmers in detecting lameness? Have we got vets, or vet techs, or clients within the practise who are on the register of mobility scorers? So definitely worth offering that as a service to our clients, and raising awareness of picking up lame cows as early as possible. Obviously as good mastitis prevention is always going to

be the best way of reducing treatment rates. So the equivalent programme for lameness would be the HealthyFeet programme. So I'd certainly recommend getting vets signed up as mobility mentors, and going through the training, which is available from BCVA. And lots of resources available on the AHDB website as well. So the whole process involves some looking at the, doing a training audit, skills audit with the farmer, having a look at the records for what the predominant lesions have been, and working out which of the four pillars of lameness control are the most relevant, and drawing up in conjunction with the farmer a mobility contract for the actions that are going to be taken to address them.

So finally, we're now going to come on to infectious disease control. I couldn't really, really talk about reducing antibiotic use without mentioning this, but I'm not going to dwell on it too long. So obviously there's infectious diseases which are really common on our farms, for which there are very effective vaccines available, and really no excuse for not having good control measures in place. So I suppose the starting point might be to carry out a vaccine audit of your dairy plant, but also to offer a reminder service, and just to make sure that there are no gaps in the vaccination protocols. Johnes disease would be another disease, which, if active, can be really undermining cow health and contributing to unnecessary antibiotic use. So obviously now every dairy farm should have a Johnes control plan in place. Describing biosecurity, monitoring control measures. There's BCVA Johnes veterinary advisor training available. And obviously the dairy farms should be making an annual declaration on what that approach is. So likewise there's national programmes available for BVD. They vary across the devolved administrations, but there should be a control plan in place. It's worth looking for weaknesses in the vaccination strategy, and carrying out screening to make sure that the BVD control is effective. So again, training available from BCVA.

And then finally, I'm just going to mention farmer training, because I think this is another topic that underpins everything else that we're trying to do. I'm not just talking about farmer training programmes, farmer training meetings that we organise. There's also sort of constant programme of farmer training that should be going on every time we're on farm. So we should be talking about fresh cow protocols, calving protocols, when to call in the vet, how much should farmers be trying to do on their own, and at what point should they be calling us in. Picking up lame cows quickly, are they getting the right treatment? Are they getting their feet lifted straight away? Is traumatic reticulitis a big problem on the farm? What's the tyre disposal situation like? How are downer cows being managed? All of these things are things that we should be continually talking about with our clients. And then obviously, we can also offer training courses. So the obvious ones to think about would be relating to responsible use of medicines. There's a requirement for Red Tractor farms to have undergone either MilkSure training or safe use of veterinary medicines course since October 2016, but I would argue that really all our dairy farmers should be carrying out both of those, because they're covering quite different areas. So again, those would be really fundamental to responsible antibiotic use.

So just to summarise, we're not trying to eradicate antibiotic use. We're trying to use as little as possible. So we're going to do that by reducing the risk of disease challenge. With good farm management, biosecurity, health planning, vaccination programmes, all of these, all of these things. But we don't want to be using medicines as a substitute for good farm management. So we want to use as little as possible, but we also need to be using as much as necessary. So there are animals that are going to need treating, and that should be done responsibly, following diagnosis and prescription by a vet, following the protocols and the health plan. So these medicines need to be purchased from an authorised supplier, following label and veterinary instructions with the correct dose, the correct

course, observing the correct withdrawal periods, and with correct storage. Ah, so that's a short list of references, and that's all I really had to say for today, but I'm open for any questions.

- Thank you very much, Rachel. That was really great. I'm just going to kick off here. So as a self proclaimed sheep person, I'm on sticky ground here. But through a couple of your slides you had photos, or you had a little icon of an elephant. Can you explain your elephants in your dairy cows?

- Yeah, sorry. There's a lot, there's probably far too much stuff on my slide that I didn't explain. So you may see this one popping up on the youngster module as well. It's what we called the elephants in the room. So we felt that there were a couple of, sort of issues within the industry that were really hard to address, where maybe some poor practise was a bit more widespread, so that was the elephant symbol. Sorry about that.

- Brilliant, no, that's really helpful. It puts into context. We can cover a lot of farm animals in Farm Vet Champions, but we can't do elephants as well, but it's good to know where the elephants come in. So far on the questions, I've had somebody say, what a fantastic presentation. So thank you for that. Now the other question. You mentioned a couple of times how antibiotic footbathing is not appropriate in lactating cows. Did you by implication mean it is appropriate in non lactating cows, or can you just explain yourself further with antibiotic footbathing?

- Basically, it can't really be justified under the cascade for lactating cows, because there are licenced alternatives which are effective. And because obviously it would trigger a seven day minimum statutory milk withdrawal period. So I guess that in theory, there might be circumstances where you could justify cascade use of antibiotic footbathing in non lactating cows, but that would be under the discretion of the vet. I would imagine that would be in quite severe circumstances. I don't think there's really a place for the antibiotic footbathing.

- No, that's fine, thank you for clarifying. Okay, so actually, I have got something here. Our main issue is data gathering. So too many treatments are unrecorded, some farmers do shop around, so the practise sales don't reflect the usage. Have you got any suggestions as to how to deal with that? Should we refuse to sign off Red Tractor reviews if there's any doubt existing?

- Yeah, I think this is a really live topic at the moment, and it's being raised at many levels. The short answer is, if you're not confident that you're being presented with the complete data, I don't think you can sign it off, can you? I think if you're going to do an antibiotic review with a farmer, then you need to ask for the complete antibiotic data, whether that's come from another source or not. I think it is one area where we can maybe show value if we can handle this data well, and use it to show the farmer things that they maybe haven't appreciated previously. If we can add value by analysing this data, we can perhaps persuade our clients that they shouldn't be shopping around and using multiple prescribers. But it's a tricky issue.

- Agreed. And thanks Rachel. There's a specific question here from Morgan about whether you consider anti-microbial usage is justified in cases of toxic mastitis. So she says that she knows vets that will do everything from no antibiotic at all, to using fluoroquinolone as a first line treatment. What's your opinion there, Rachel?

- I don't think there's much justification for using fluoroquinolone as a first line treatment. It would be hard to justify, because you're needing culture and sensitivity data before doing that. And obviously if you're talking a coliform infection, it's going to be one of thousands of strains on that farm, and it's going to be a different one every time, probably. I think there has been research that showed that antibiotic use was of no benefit, but there has also been some research showing that it's a benefit. So I would always recommend using a system of antibiotic in those cases. But obviously, yeah, you're not always going to get a good outcome. I think, just, sorry that I didn't have time in my presentation to go into these things in detail, but I think there is some recent research suggesting that there's not much benefit if you're going to use a systemic antibiotic for toxic mastitis cases, not much benefit. And then also using intermammary tubes.

- Thanks. And then we have a question here about dry cow therapy for very low cell count herds. Would you want to use widespread selective dry cow therapy, or would you want to use more judicious use?

- So a low cell count herd would definitely be a great candidate for selective dry cow therapy. I would argue that all herds are candidates for selective dry cow therapy. So a low cell count herd would be a good candidate, and it would be a good candidate for having slightly higher thresholds, because the there's going to be a low prevalence of the systems infected, the systems of the infected cows in those herds. And in fact, we've had some low cell count herds, very low cell count herds, with gramme negative pathogens and low levels of chronically infected cows who managed to almost eradicate antibiotic dry cow therapy. So yes, definitely, they would be the best candidates. There might be times where you've got a big risk of, summer mastitis might be an occasion where you might consider antibiotic prophylaxis for a brief period, but in most cases, I would suggest that using internal teat sealants would be effective in those scenarios.

- Even through periods of high risk for summer mastitis?

- We all know from our experiences before we had internal teat sealants that antibiotic dry cow therapy is no guarantee of protection against summer mastitis. So yeah, I'm not sure. I think we all have individual scenarios where we might make certain recommendations, but my first line would always be to use an internal teat sealant.

- Very good, thank you. Thank you, I think that's our dry cow therapy question. We've got another question here. So this is an interesting one from the platform. Robust prescribing protocols in

practise A may be undermined by a neighbouring practise, B. Should we be pushing for a valid client practitioner relationship within the legislation?

- Yeah, this is a big problem. And possibly, yes. It's a difficult one, isn't it? To legislation, maybe not possibly within the legislation. Possibly it could be done through farm insurance, possibly other ways. There's lots of different ways of tackling that, but it is definitely undermining good prescribing practise. And part of that is to communicate with our clients what the effects are of these things, so that they fully understand. It's not just about cheap drugs, is it? It's a lot more than that.

- Yeah, and it's very much a motivation for us as a whole profession to be working together, isn't it? To make sure we stick to our professional standards, but it is a tricky one, and I hear it quite often from vets. If we do that, what happens if a client's going to go next door and pick up medicines?

- I think it's our job to be constantly striving to demonstrate value to our clients for the benefit of a really good client farm relationship, and the benefit they get from that, that it's more than just prescribing medicines to them. That the relationship should bring them a benefit. But it's a difficult one, depending on who your neighbours are, and how they're behaving.

- Yes, indeed. One of the things, and this relates back to John's question about prescribing protocols and client practitioner relationships, is just reminding us that we've got quite a few behaviour change modules. I know, Rachel, you contributed to motivational interviewing. We've spoken to a number of communication, vet to farmer communication specialists and behaviour, and specialists in behaviour. So we have got a number of modules that would go alongside this training, so Rachel was very much asked to do species specific stuff without all of the details. So I think I'm quite excited about some of those other sort of softer skills, persuading clients to make the change. Brilliant. So a number of other people have come in. Andy says, great talk. Interested in your slide around cow resilience. Interested to know how you are both measuring and managing it.

- Yeah, it's a tricky one, because it's quite difficult to pin down. I think it's a question that is always at the back of my head with any issue. I think I almost include it now in any topic, which is, is cow resilience a factor? Have we got the right sorts of cows? Are they being undermined? So you can be looking at mastitis management, but if you've got BVD life in the herd, it's going to give you high cell counts. Or if you've got the wrong sort of cows in the wrong sort of system, everything else is going to be a struggle. So I think it's just a question I always ask, and it's much better to be taking a step back and talking about cow resilience sometimes, and getting buried in the reality of a particular disease.

- Brilliant, thank you. Somebody's asked, any suggestions how we sort out young stock from the adult cow use when we're reviewing antibiotic use? How do you do that within your practise, Rachel?

- Yeah, so obviously certain medicines, it's easy. So your pneumonia medicine, antibiotics that are only used for young stock, it's easy. Some of the others, unless you are going to have separate enterprises, or if you're using particular software where you're looking at the medicine book data, then it's quite tricky. So some of our clients, we would have a separate young stock account. And even then, you have to remind people to tell you which account you're looking to, and you can still get mix-ups. But yeah, for some of the antibiotics, it's tricky.

- And then you can add the sheep flock into the mix as well.

- Absolutely, absolutely. But with all these things, the first thing is to demonstrate that there's a benefit in recording it. And once people can see there's a benefit, then there's an incentive for them to record it. So if we're not analysing our client's medicine records, there's no incentive for them to tell us which enterprise they're ordering for when they ring up. But if they actually get something back for doing that, it's a better incentive.

- Yeah, and there's always that brilliant incentive, that farmer competition thing, isn't there?

- Yes.

- Where actually, once you know what your figure is, none of us can stop ourselves wanting to modify in future years, so I always think that's one way. Well, it remains me to say thank you very much to Rachel for putting those together, well, for pulling all the cattle stuff together, along with other BCVA board members. That's been really, really brilliant. Please do go back to your colleagues, and tell them about Farm Vet Champions, and get people to sign up. Each of these, we'll probably end up with about 20 hours' worth of CPD and training that is free to access to people who signed up. And with ongoing future things, setting goals, we're really establishing a community of Farm Vet Champions. So we are really excited about this, and really would like people to pass the news on. But thank you very much, Rachel, thank you to the rest of BCVA. And I think that's it.