



## **Title: Responsible antibiotic use on goat farms**

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- Okay, so welcome everybody to this webinar by Nick Perkins on the Responsible Use of Antibiotics on Goat Farms. This is a webinar for Farm Vet Champions. I'll just quickly do an introduction to RCVS Knowledge. So the mission of the RCVS Knowledge is to advance the quality and veterinary care for the benefit of animals, the public and society. And we are meeting this mission by championing the use of evidence-based approaches to veterinary medicine, inspiring a culture of continuous quality improvement in practise, and making resources available to the profession and the wider public, as a separate organisation charitable arm of the RCVS. So let me introduce you to Nick. I'm sure everyone who's had anything to do with goats has already met Nick at some time rather. Nick has a certificate in cattle health and production. He qualified in 1989 and spent five years in mixed practise in Devon and then concentrated on dairy cattle work in Somerset. But from really early in his career, Nick had developed a keen interest in goats and worked with several large dairy goat herds as well as the usual mix that our clients have of pets and small pedigree goat keepers. So Nick joined the Goat Vet Society as a member early in his practising life. Then joined the committee and he's currently the president. And then after 24 years in practise, Nick joined the Veterinary Defence Society as a farm animal claims consultant. So we're really delighted that you're with us for this Nick thanks ever so much for putting these slides together, for consulting with your colleagues and about them and for all your contributions to the Farm Vet Champions.

- Thank you very much Fiona. I hope that everyone can hear me and welcome to this Farm Vet Champions module on responsible use of antibiotics on goat farms. So I won't repeat what Fiona said, you know who I am and what I've done. The only thing I'd like to add is I have been out of clinical practise for a few years. So please go easy with me on any clinical questions. But I have got a number of very knowledgeable colleagues in the Goat Veterinary Society. So anything I can't answer, I can come back to you with the information at a later date. Or alternatively, you can always approach the Goat Veterinary Society at any time for advice or guidance on all goat matters. A few particular thanks to colleagues, Ben and Yasmine who've assisted me in the preparation of this presentation, and to David and Rachel for helping with editing and to the RCVS Knowledge team for helping me pull it all together.

So the aim of this module is to help you identify where the risk areas for inappropriate use are in goat keeping systems. You should perhaps be aware that while on a strict volume basis, the quantities of antibiotics used in the goat sector may be low. There are some particular areas and ways they may be being used, which can give cause for concern. So we want you to understand the principles of plan, prevent, protect, that it sort of ensure antibiotics are used correctly safeguarding animal welfare. But at the same time, encouraging the development of strategies to reduce disease

and the consequent need for antibiotics. It's also important to understand how to apply these principles in practise.

Perhaps more difficult in the goat sector is measuring use. There's not been the same amount of work done with other species to develop industry standard metrics to benchmark against, but there are some measures you can take at a practise level to try to establish baselines from which you can measure progress. A little bit of background just on the UK goat sector. There are only just over 100,000 goats registered in the UK, and there will be a few more than this. We know that there are unregistered pet keepers who aren't aware of the regulations and the need for goats to be registered, and it's worth keeping an eye out for these clients and educating them on the importance of being properly registered as these goats do frequently get presented to vet practises. But of course, that means that for all of you out there who treat goats, that almost certainly form a minor part of your work. And you may be principally involved with sheep or cattle or both, or in a truly mixed practise, and that's normal and that standard.

So we're gonna look at just a few hotspot areas in goat production that are likely to be areas where antibiotics may not be used appropriately. Perhaps one of the most important considerations when you're asked to address a health issue on a goat farm is understanding the client's concerns. Quite often, you can attend and there may be a number of problems which are immediately obvious to you which are wrong or which need addressing. But it's always worth taking the time to really understand what it is your clients wanting to achieve before you get down to the business of planning change. Because if you don't get this right, and you and your client aren't working to the same goals, then it's actually very unlikely you'll achieve successful outcomes. We've already said that there are not established metrics for the goat sector, but that doesn't stop you asking yourself some questions at the outset. Do you even know who your clients are? Have you got them separate on your practise management system? Do you know what veterinary medicines they're purchasing and using, and how much and when in the year they're buying them. Is there a plan in place already for the medicine's use? And if there is, is it actually being followed? And of course there's very little licence for use in goats. So have you actually reviewed what dose rates is being recommended, on what basis that recommendation is being formed? And then actually is that is what is being used on farm.

So there is some common requests that you might get that aren't particularly different to other species. You know, the lame goats maybe have some antibiotic, are being asked to have some antibiotic kidding. And these might be the kinds of requests that you receive depending on the types of goat keepers. Some of the problems are of course very similar to sheep flock issues, but in the goat dairy sector where the kids are reared away from the mothers, then the problems and therefore the requests may be far more similar to dairy cattle when you're trying to apply principles that you're more familiar with in other species.

So if we start with lameness, since they've been quite a lot of interesting work done on this in the goat sector in the last few years. So goats certainly suffer from *Dichelobacter* in the same ways as sheep, and can suffer from scald and foot rot. But investigations into a couple of goat herds suffering with a high prevalence of lameness found lesions which were not typical of foot rot. There was sore ulcers. There was white line disease, misshape and claws and often with non-healing lesions on. PCR testing in these cases found their evidence of *Dichelobacter* being present but did identify the presence of *Treponemes*. But the study went on to sample young stock with normal feet, which weren't lame and no evidence of lesions and PCR testing still identify *Treponemes*. They found ruminal acidosis was also a big problem in the adults. And the conclusion of the study was that both nutritional and environmental factors are likely to play a significant role in lameness in-house dairy

goats with primary choral lesions of nutritional or mechanical origin becoming secondarily infected with pathogens. The study went on to PCR tests from two herds with classical signs of foot rot, and three herds with evidence of the novel lesions. Now *Dichelobacter* was found in the herds with classical foot rot, but not in any of the lame animals sampled in three herds with the novel lesions.

So the key message from this is careful clinical examination to make a diagnosis is key. So as we said, diagnosis is key. Is there an infectious cause? And if so, is it the primary pathogen or is it secondary to other factors which need to be identified and addressed? Once you have a diagnosis, then you can start to assess the risk factors. Many of which in-house dairy goats may be similar to dairy cattle. Whereas grazing goats perhaps pets, their problems may be more keen to sheep. So you need to ask yourself is the diet balanced or is there ruminal acidosis going on? What's the hygiene of the unit like? Are the passageways clean and dry? What about the bedding? Is that clean and dry? And what about the surfaces the goats are living and walking on? Are they in fact tools soft? And is that resulting in overgrowth? Remember goats are well adapted to semi-arid rock and sandy conditions and that really have faster hoof growth than sheep. So foot trimming is actually required in most herds, but the same risk factors with a potential for spreading pathogens and perhaps even causing lesions through open trimming are present with foot trimming. So it must be done very well and hygienically, and the lame animals need to be isolated from sound ones. So you need to ask is there any other concurrent disease as well. And in planning any lameness control programme, it's essential to start with a measure of the lameness at the onset. So you need to put in place mobility scoring and that way you can monitor the progress of any programme that you've put in place and you're able to review it. So to summarise, when you put in place your lameness control measures, you're gonna need to use what we know about lameness control in sheep, and in dairy goats consider the pressures of high planes of nutrition and lactation which are more similar to dairy cattle. However, you also need to remember the goat's natural environment is a very abrasive one. The goat is of course a browser and not a grazer and therefore grazing on last wet pastures is not entirely natural for them. And it's also worth keeping this in your mind when applying what you know from other ruminant species.

Once you have your plan and you've identified the balance of pathogens and non-infectious causes, you can start to put in place measures to reduce the causes of lesions and apply the same principles as for sheep in controlling the pathogens. In particular, of course if you attend a herd with little or no lameness, and there are quite a few with very low lameness, then planning and prevention is exceptionally important. You need to identify that the problems aren't there so that you can put in place the bio security measures to keep them out. With infectious causes of lameness the same principles applies with sheep, with lame animals must be isolated and treated quickly while chronic cases are culled. Temptation for dairy goat keepers is to keep lame goats and persist in trying to treat them. But a study showed that even with quite radical culling, you often have a minimal effect on overall milk yield, but it will make an enormous difference to the pathogen burden. And if put in place with measures to reduce transmission, isolation of clinical cases, cleaning passageways, milking lame animals last, cleaning the parlour and passageways thoroughly between milking, clean dry bedding excellent hygiene at foot trimming complete with completely different facilities for tripping lame and sound animals. Then you will get a significant improvement.

Worth mentioning that perhaps breeding programmes are not as advanced with goats as cattle and sheep, AI is not as advanced and poor conformation is seen in many herds. Breeding records are also often poor. So improving these at the onset and improve and breeding only from sound does with good confirmation will help enormously. We've said that foot trimming unfortunately can't be avoided in house dairy goats, but we can do much to protect individuals from becoming lame with

Careful foot trimming to keep good conformation and avoid causing lesions. Just a word of warning. If you do work with a herd with foot rot, and are considering off licence use of the foot rot vaccine, there can be quite marked suppression of milk yield. So be very careful if you're thinking about using it in dairy goats.

Moving on to periparturient disease. It's no surprise that kidding is a very high risk time for disease, and therefore likely timeframe for RTQs. What are the types of inappropriate use you might find in place that you need to address? So if a farm has a particular problem such as metritis they may think it will help to inject everything in kidding. They may use the wrong class of antibiotic too shorter course under dosing. They may not know the weight of their animals. You may identify poor husbandry being propped up by antibiotic use. The kind of diseases that need antibiotics are listed here. But once again, records are very important to establish the level of the problem and whether it indicates an underlying problem that might be present as well such as pregnancy toxemia. You need to develop a herd health plan with standard treatment procedures for each condition. You want to agree on a first line antibiotic choice for treatment, discuss when veterinary intervention is gonna be required, and when antibiotics may not be required. So clean kiddings where there hasn't really been dystocia, where any manual event intervention was minimal and clean and done hygienically. You need to be educating staff on correctly identifying the different diseases. So they know when to put which standard operating procedure into practise. And all of that is fine on the bigger clients where you might go more frequently. But what about your smaller clients? You need to take the opportunity when you're a vet on farm and visits running up to kidding time. If you get to go and scan or whatever, take the opportunity to discuss those points. And very important right from the outset to put in place recording of cases, enabling you to review the cases and troubleshoot if there are problems. And clostridial vaccination must be in place and up-to-date with goats.

So, we'll find that there's only one person in the practise who does the bulk of the routine goat work, but many others will get asked to attend out of hours or just to perhaps prescribe or dispense when the regular person is awake. So you need to spread the message widely in the vet team as well as to clients and ensure that the protocols are clear for everybody who is dispensing. And consider what ancillary treatments may improve cure rates and reduce the need for antibiotics. There may be times when analgesia is needed but not antibiotic. And you need to record and review your antibiotic use. And to do that you're gonna need to make sure you can separate out the sales of antibiotics for goats if the client has a mixed enterprise and has different species. In reviewing health records, you need to ask yourself are there predisposing factors which could be increasing the risks of these diseases at kidding time, and could these issues be addressed? Are there high rates of dystocia for instance requiring intervention and what might be the cause? Is it diet related? Is it the size selection? Is it the body condition score of the goats? And ideally of course, this needs to be done well ahead of kidding time. In your antibiotic review you need to help identify potential overuse of antibiotics and put in place prompt prevention measures to help deal with the conditions. Kidding management is key, cleanliness and hygiene, the use of gloves, regular clean bedding changes, keeping all the equipment clean and disinfected ropes and snares as well as the whole area of the management. So needs to be planned well in advance, and discuss all of this with the whole farm team. It's no good just discussing it with the boss and the owner. Everybody needs to be aware.

Pregnancy toxemia is a key focus area for dam and kids' health. And we'll come back to it a little later but avoiding over fat goats is absolutely critical. Careful dry goat planning is also essential. And once again, you've got some similarities with sheep in terms of nutritional planning and feeding for twins and triplets, but also in dairy goats you've got the other management to consider in

preparation for the next lactation. And achieving effective drying off and obtaining the right plane of nutrition for twins and triplets can be challenging. Now mastitis in dairy goats is quite complex and very different to cattle. It's also quite farm specific. But the one thing that we can say is that dry goats antibiotic therapy should not be being used routinely. Any mastitis problem needs to be thoroughly investigated and a plan developed. Gangrenous mastitis can be a problem on some units. And the extent and role of subclinical mastitis is still poorly understood, but may be a problem. In any event, a specific plan will need to be put in place. Just a point and a reminder that there is a licenced vaccine against staph aureus mastitis, it's licenced for use in goats. Once again, be aware of the possible links with other diseases such as pregnancy toxemia.

So here's a summary of the diseases that are likely to need antibiotic use, it isn't a comprehensive list but it should be a starting point for initiating planning and prevention of disease. Much of the key to reducing periparturient diseases lies in ensuring a good kidding, and therefore concentrating on prevention of pregnancy toxemia is vital. It's a very big risk factor for stimulating other disease and can be very difficult to avoid, particularly where dairy farms are using standard lactations and flat planes of nutrition. So over fat is perhaps the biggest risk factor and can also be an equal risk for hobby farmers. You know, the ones that feed too many digestive biscuits last thing at night. So once again, you need to apply some of the sheep and some dairy cattle principles. Nutrition requirements are very different for singletons and twins as with sheep. But you've also got high yielding athletes like the dairy cattle. So metabolic profiling can be very useful too particularly the high risk dose. And management, thinking about the management of the whole the dry goat period and the feeding space, quality housing, et cetera is also essential. There are various body condition scoring systems out there for goats, and you need to find one that works for you and that can ensure consistency. But the pictures show a fairly standard one that's in use that combines a lumbar score and a sternal score. You need to remember that dairy goats carry a large amount of fat reserves intraabdominally, and therefore you can't just go on an external lumbar score or tail head score like you might in cattle, but the sternal score helps create consistency.

So moving on to post kidding diarrhoea, it is very common problem in herds all sizes and right for inappropriate antibiotic use. Once again, there's the same potential for inappropriate use, blanket use, wrong class, wrong route, wrong dose or it may be being used to cover management deficiencies. We need to think what the possible causes are and make a diagnosis to avoid blanket treatments. A lot of known bacterial causes which clearly needs investigating are present. Once again we've got nutritional causes, parasitic causes, toxemia pats and some specific infections. And although enterotoxemia is relatively common as a cause, the conditions that allow clostridium proliferation in the gut can actually often be addressed as well. So you need to incorporate this into your herd health plan with protocols for treatment, recording and intervention levels. Remember enterotoxemia is actually often acute or paraacute, and therefore prompt diagnosis and intervention is crucial. Vaccination against clostridial disease in goats is essential, and they don't develop perhaps quite the solid immunity that the other ruminant species do. So vaccination probably needs to be a minimum of every six months, but according to the risk factors it may need to be three times a year. It may need to even to be as frequent as quarterly, but be aware of the other factors as well. So the nutritional stability, dietary changes, all of which can cause clostridial proliferation. And be aware of the other stresses as well. Moving groups, social hierarchies, handling procedures, management procedures, all of which can trigger problems but with careful planning can be prevented. But having said that prompt treatment of clinical cases is required if you've done all that you can to other cattle causes. So don't hold back when treatment is needed. Neonates and young kids.

Once again, you know these are the kinds of issues that you might, that might be ringing alarm bells. And they may be similar to sheep again, if you're dealing with meat goats or small hobby breeders, but might be much more like dairy cattle in the larger dairy herds of goats. So remember that the causes of abortion and stillbirth are very similar to sheep. So enzootic abortion and toxoplasma would be top of the list. Watery mouth and joined tail are also prevalent. But as with calves, scour and pneumonia are also big causes of morbidity and mortality. So you need to find out what the scale of the problem is. And that isn't always straightforward because records are often bought, but studies have shown that mortality can vary enormously kid mortality can vary enormously, which is quite concerning in itself. But of course it does mean that where there is high mortality, there's a lot of room for improvement and most of that will come from management without the need for antibiotics. So you need a plan. And of course that plan starts well before kidding. Because you need a good kidding with a healthy vaccinated dam to ensure that you end up with high birth weights and quality colostrum. So management is the key for successful cholesterol transfer. So you need to ensure good kidding management and proper facilities. The factors which are essential to colostrum transfer in the goat are the bond that's formed between the kids and the dam, the vigour of the kids which will relate to the ease of the birth and the birth weight. The environmental temperature and the time that the kids spent with the dam. So you need a clear rearing plan to manage the kidding period and the immediate neonatal period. And then you need to measure your colostrum transfer to ensure that the plan is working. Measuring the immunoglobulin levels in the kids. So try to identify the risks before the problems occur and put in place protocols, and then keep records, set the indicators that you want to measure and measure them and then keep on and review. In a dairy situation where the kids are being reared away from the dams, it is much the same as dairy calves and therefore housing and hygiene become important. Young stock rearing really should be a job on its own. And it's always done more successfully when one person takes responsibility and it's not just left as a job for somebody to have to fit into their normal working day.

So looking at colostrum, we can think right, let's think about the quality that goes back to the doe and preparing the doe pre-kidding. But you may also be aware that you may have to pick high yielding does that might be producing poor quality colostrum. So you need to think about that and prepare. The quantity of colostrum the kid's going to get, that's gonna depend on the environment and the maternal bond that's formed, but also if there's any likely to be risks and high risk situations, then you can think about what supplementation might need to be given and needs to be put in place beforehand quickly. So you need 10% of the body weight in the first six hours. And if you get that right, then you can minimise a lot of the problems and a lot of the need for antibiotics. But think about where the high risk areas might be, the triplets, the low birth weights, the does we said with a high milk yields that might have poor colostrum or animals being born into cohorts already where there is disease. And be prepared to treat early, clinical cases early in those situations.

So respiratory disease. What's gonna be in your plan. So housing for the young stock should be in a dedicated area, not mixed with other age groups. All in all out of small groups is essential and really helps to reduce the transmission. And therefore the numbers of animals which needs to be treated when disease does enter a group. Getting the nutrition right and the quality and quantity is obviously vital. There needs to be sufficient air change, but without draughts. And that means good insulation. All the equipment needs to be kept scrupulously clean and disinfected. And you can prevent problems by ensuring that the dams are vaccinated. You avoid mixing, don't overstock, that they have sufficient teats and feed space and early treatment of clinical cases.

So just a few final words really on goats and medicines which is perhaps a particular problem. There are of course very few licenced products for goats. And that means that invariably, you will be using

the cascade to treat goats. But just pointing out one issue. There is currently only one licenced antibiotic for using goats. And ironically, that happens to be baytril, enrofloxacin which is of course a highest priority critically important antibiotic. But just because it's licenced, it doesn't mean that every bacterial infection in goats should be treated with baytril. It is reasonable to use the cascade where the licenced product is not suitable, and it may not be suitable where a narrow spectrum antibiotic will do, or it may not be suitable simply because it's a highest priority critically important antibiotic. So you are permitted to use the cascade and use other antibiotics. In picking your antibiotic, choosing. You need to think what's the most appropriate formulation. Is it gonna be oral or is it gonna be injectable? And what's the correct dose? You may need to refer to the manufacturers or to textbooks. Don't assume that it will be the same as sheep or cattle. And is there any known resistance, sensitivity testing should be performed regularly. Avoid prophylactic and metaphylactic use where possible but don't hold back from treating clinical cases promptly. And then the key is taking whatever other measures you can to prevent the need in the first place. So when you're using antibiotics or any veterinary medicines on the cascade, you have to remember the responsibility is yours as the prescribing veterinary surgeon to ensure that no residues reach the human food chain. The onus is on the veterinary surgeon to set the appropriate withdrawals, but always remembering that they mustn't be less than seven days milk and 28 days for meat. But remember also that there are additional record keeping requirements for cascade use. So I'd recommend that you set them up as standard for your goat clients, and take care to ensure that you've obtained off licence consent.

So we've covered a lot of areas very quickly and you can't tackle everything in one go. Many of them are interrelated and plans for one will go a long way towards planning for other issues, but set yourself some simple goals first off. It may sound simple but do you know who all your goat keeping clients are? And if they have more than one class of livestock, have you got separate practise records so that you at least have a measure of purchases for goats alone? There are no industry-wide metrics yet, but you can at least track an individual units usage and performance. So for each client, identify the key area of antibiotic use, set yourself a plan, targets and regularly review. That's it. Thank you very much. There is a bit of further reading for anybody that's interested, and those are the references that some of the work was based on. Thank you. Thank you Fiona.

- Brilliant, thanks Nick. That was great. It's really feel free to have your only licenced antibiotic to be an HP-CIA .

- That's a bit unfortunate.

- Definitely. So if goat sort of turned to antibiotics what would you say were the most commonly used oxytetracycline so.

- Oxytetracyclines would be very commonly used and penicillin and penicillin-streptomycin combinations. Very commonly used.

- Yeah, yeah. I mean, of course the challenge is you've really got to do the dairy and the sheep and that you really have got to put everything into goats, isn't it? It's a challenge.

- You have, but I think people sometimes get frightened. They think that they don't have a lot of experience with goats they fight shy of it. Whereas often the same people have got a lot of experience with sheep and with dairy cattle and it's fine to apply those principles. You just have to think where the differences are and where each one is most applicable and just have a few basic knowledge about goats like the difference with feet, like the fact that they're a browser, like the fact that perhaps they don't develop immunity in perhaps the same way as the other ruminants because they're browsers, et cetera. So, you know there are all sorts of slight differences that it helps to know but then apply the same principles.

- And then of course, you've got a good culture within the Goat Vet Society of people happy to share their knowledge with other practitioners presumably.

- Absolutely, we're all learning together all of us. And so we just love anybody who has an interest or who has a particular problem or question to come and share it. We haven't necessarily got all the answers. There isn't a huge body of scientific work but by sharing information and sort of working together on things we can get a lot achieved. So anybody should feel free to contact us and go back to society at any point.

- Brilliant. That's really helpful. Now thank you Nick. I have got a couple of specific questions. So apart from Estelle is saying what a brilliant presentation. Thank you very much for that. I would definitely concur with that really interesting. So one of them, when we're talking lameness, Hannah asks do you recommend routine trimming for goats or is it just that overgrowth may contribute to lameness and to trim when indicated, what's your view?

- Well, definitely the latter really clearly if there isn't overgrowth then you shouldn't be tripping. The problem is that in most goat herds, you will get overgrowth if you don't trim because of the fast rate of hoof growth. And because they are often not walking on the naturally abrasive surfaces that their feet are designed for. But if you come across goats in systems where their feet are not growing too long because they've got suitable abrasion or whatever, then you shouldn't be trimming just for the sake of trimming for certain. But most farms will find that they do need to and you do need to keep good confirmation or you can end up causing mechanical lameness and potentially mechanical lesions which then can become secondarily infected with pathogens.

- Okay. Thank you. And I suppose I quite like to go into some detail about your clostridial vaccine. So is it, do we have anything licenced clostridial from you is lambivac.



- Lambivac is not my understanding is that lambivac is not licenced anymore but it was. And I think that would be purely technical in terms of costs or whatever in keeping the licence. It is still available. And it is still I think what most of us would recommend as the most suitable clostridial vaccine. Again, there is some doubt over how well goats respond to multi-variant vaccines. We know that they don't develop the same degree of solid immunity that sheep and cattle do which is why you need more frequent boosters. And there's some thought to maybe mainly anecdotal that multi-variant vaccines with sort of eight or 10 clostridial components may make that situation worse. And to be honest, the main issues tend to be enterotoxemia which is obviously in line of that potentially tetanus which is also there. So, lambivac is probably the one still to go for.

- Okay. And so just to clarify, that's not the same dose rate as standard dose rate but you would use your booster every six months as opposed to annually.

- Yeah. Standard dose rates, standard primary course. But then if you're starting from fresh put in a six monthly booster regime but if you get problems, then achieve your diagnosis make sure it's enterotoxemia. You want to look at what the other factors that may be involved that's causing clostridial proliferation but in the short term, you probably want to reduce your booster interval to try and help gain control particularly while you put in place other measures which may be nutritional or whatever to help.

- Okay. Brilliant. And then I noticed you put, when you were talking about kids and respiratory disease you put vaccination, would you use ovipac P or ovipast for goats for young respiratory in younger animals, why not?

- There's very little evidence to suggest that the vaccines are particularly good at pasteurella control, but I certainly would not use a combined clostridial pasteurella vaccine. But probably would recommend going for pasteurella alone rather than combined. Yeah.

- Brilliant. Thank you. That's really helpful.

- If anybody wants specific advice on that then we'd probably can give better information through the Goat Veterinary Society, but it's not at my fingertips, lack of being in clinical practise, sorry Fiona.

- No, no, no, no, not at all. That's it's brilliant. Okay. Now Ellis has asked, in diarrhoea in kids what's the reason for adding vitamin B? Supportive.

- It's really just I think supportive. Supports the liver during that difficult time. Yeah. It's just general support during that time, yep.

- Yep. Okay. So often you're treating symptomatically really fluid, so yeah.

- Yeah.

- Fair enough. Thank you. And then, so now we've got so into the legalities here. And so John speaking about cascade use is only for individual cases, should not be used routinely and only under veterinary direction. So, does this trump under the VMR, baytril use purely on the basis that's an HP-CIA? Interesting though me.

- Yes. I mean my understanding of the cascade uses. It's supposed to be on a case by case basis. I think rather than individual basis I stand to be corrected, but I think it's a case by case basis. Which does create a few problems, does create problems in terms of setting up protocols perhaps that involve antibiotic use. And I think that has to be carefully managed and carefully discussed with the client. And really what it does is it puts an onus on you to be more involved I think with the case and the level of disease and what is happening on the farm so that you can demonstrate that you are in close control of cascade use. These are questions that I get commonly asked in my day to day job. And I have to say that you can't write the rules for every situation. And the fact is that there is a whole goat sector out there and there is very little that is licenced, but you still have to apply the same principles of herd health planning and control as you would with another species. So I think you just have to be sensible about it, make your client aware, make sure you've got the off licence consent and keep careful control. And I don't think anybody's gonna come down on you like a tonne of bricks for the fact that you've got protocols that are broadly using cascade medicines, because what else are you to do?

- And so as a routine, would goat practitioners have their clients sign something on an annual basis? Or if they've got a bottle of penicillin, a bottle of oxytetracycline on the form, would they have some sort of something set up to cover? How would that.

- Yeah, I think they should at least acknowledge and provide off licence consent as part of that health planning review and remind them every time that you're reviewing or changing a protocol or changing a treatment strategy. Always do that to make sure that you're gaining back consent each time, and have it written into your health plan. But it's very important as well that they have got the correct instructions for using the antibiotic. So the dose rate, the route of administration et cetera. So even though it's technically on a case by case basis, I think if you've done enough work on what the problems are, then you can justify that you have control of those cases and that's probably the way to look at it. But it does mean that there is more onus on you as a veterinary practitioner just not to dish out antibiotics without having any idea of how they're being used. That puts even more onus on you.

- You know it's good we've got a legal expert for this one. Actually Pam's very helpfully put in the chat. Pam moved out. She's done a lot of basic medicine general modules that she agrees it's a case to case basis, but and they in some of the general Farm Vet Champion modules we are discussing the legalities and our responsibilities as practitioners which would be very helpful. And I don't=-

- I did hope that Pam wasn't gonna jump in and correct me too much.

- She's backing you up Nick, it's okay.

- That's all right. I like that.

- And John's put back in the questions. Yeah. I guess you'd back up each case with bacterial isolation sensitivity to audit your choice. Yeah, I suppose the more we can encourage people to be auditing what we're doing and having some sort of sense of justification for the decisions they've made or with a client's agreement.

- Yeah. Well I think particularly one in all species, but diagnosis is the key. Getting a really good understanding of what the pathogens are. Of course, if you're gonna go to that level and you're gonna manage to identify the pathogens, then the bacterial pathogens you can get your sensitivity and you've got that information to make informed choices.

- And I mean, a lot of goat owners themselves are very knowledgeable and they, but there are also a lot of my members of vet of Goat Vet Society as well, aren't they too?

- They are--

- Is that pressure on the vet. So does that make it better or worse?

- So it makes it better because it increases the pool of experience there. And I have to say the most of the members, non-veterinary members of the Goat Veterinary Society, the farmers who come are very supportive of vets and very keen that interested vets should get together, be aware of the problems and discuss them because there aren't always immediate solutions just easily to add in textbooks or papers. And from our point of view, it's great to have them there because as I said at some point during that talk, you need to understand what they view the problems are. It's easy for us to think of diseases in isolation but they've got to put the whole thing together, what their production names are, where they're trying to go, what they want to do in the future as well as looking after the welfare and controlling a disease. So understanding what gets to them and what

they want to achieve is really important. And it really helps having them in the Goat Veterinary Society from that point of view.

- Yeah. I'm really delighted that we've properly got vet goats in here because you've certainly been left out from the room of targets. I've always felt goats don't get much of a say so I'm really delighted we've got this. And I think we can always learn goat vet, sheep vets, cattle vets between us. We can learn from each other, really appreciate your thing. So, Nick have you thought of anything that you want to add in?

- No just going on, you talked about the room of targets and it would be very useful if we could go on and develop some metrics and some targets, but from my own experience going back, working with some big dairy units, I have to say, I never felt that the volume of antibiotic use was very high. And I suspect, although I don't have the data it would be quite low, but there are as I hope I sort of identified some key areas where I think there have been particularly poorly used. And that particularly goes to the neonates, and obviously you've highlighted sort of broad prophylactic use being used in sheep. And it has very much being used on occasions and goat farms to correct what are basically quite simple management flaws to put right. And that's, so that's where the target needs to be.

- So just mainly say thank you very much Nick and also to the wider Goat Vet Society for your input into that module. Really appreciate it. Really interesting talk and thank you very much Nick.

- Thank you Fiona.

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