



## **Title: The forgotten cattle user youngstock**

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- [Presenter] Hello, and welcome to the youngstock module for the Farm Vet Champions. Today, we're going to discuss the forgotten cattle user: youngstock. So hello, I'm Kat Hart. I'm working in the George Vet Group based at Malmesbury, covering Wiltshire and Gloucestershire. Doing 100% farm work, mainly dairy, but also the odd bit of beef and sheep. I also sit on the BCVA Board and I've done a few different research projects with a few drug companies and have a great interest in youngstock, whether that'd be dairy or through the dairy beef and suckler beef industries. Firstly, I'd like take this opportunity to thank the contributors, editor and reviewers, and thank you for everyone else who's helped me pull some of this information together and hopefully produce a useful and practical webinar for you today.

So going on to the learning objectives. Firstly, I think we need to define some key hotspots, so high-risk areas within the youngstock rearing system. The ones I've selected are neonatal care, so start as we mean to go on. Scours, do we actually need antibiotics for this disease? And pneumonia, the risk of when we give phone advice and also the elephant in the room about metaphylaxis. The second point is we plan to use the plan, prevent and protect principles and how we can apply these to our calves under our care. Lastly, to be able to calculate and compare some of the antibiotic usages for these calves and consider what metrics might be useful.

So on to a background of what areas I'm gonna cover within youngstock, which is where I started. So most of these will be born on the dairy farm. One of the other modules sort of covers the suckler beef unit. So these are calves that are born on the dairy farm and then they're either kept there as a replacement heifer or sold onto a rearer as a dairy beef or a dairy bull calf and sold to the rearer programme, which then goes on to the grower. But mine are focused on these sort of three key areas. Just to remember that the antibiotic levels in these different places and different groups of animals will be different, but we'll try and cover them all in today's webinar.

So the RUMA targets, previously, youngstock didn't have a specific target. And now the aims for the 2020 to 2024 is to reduce it by 25%. So a bit of the metrics, I'm not gonna talk through them as in how you could do it on farm, but just more show you where you can get them. So there are different metrics provided. And again, these are for the dairy origin calves. So as I said, they could be heifers to retain or being sold onto rearers. And you can do this in two slightly different options, depending on the setup. For example, a rearer like this setup, we could compare batches. So how many were brought in when antibiotics were given and then left. So this will take into consideration the weights. And then there is more of a dairy-based one. So this is more for the heifers that are retained for breeding. So whether they're over six months or under six months is one of the key factors here so that they can assign weights to these animals. As I said, you could spend an hour just sort of going through a scenario of how to use these, but they're all there for you in the references at the end if

you'd like. But hopefully by the end of this, we'll have discussed some of the options and some of the more practical options of how we can engage these farmers to use these metrics.

Just to touch on cascade use. It's not as common within the youngstock as maybe other ages or within other groups of the bovine. So I'm not gonna touch on it much, but just to be aware that we do want them given the correct dosage and routes, but equally, the time intervals are important. And just to highlight that a lot of them on their licencing and data sheets do say specifically not to give to lactating or adult bulls intended for breeding. So just for completeness that's in there.

So after a bit of an introduction and overview of what I'm gonna hopefully cover in today's webinar, we are onto the hotspot areas. So the first one is gonna be this, how do we make a resilient calf? So obviously we're gonna talk on colostrum. I could easily spend hours just on colostrum itself, but I'm gonna try and keep it brief to cover all areas in today's topic. So this is a whirlwind tour of youngstock care. Also touch on the environment and nutrition. This is really important as we can really make this calf a resilient calf from the start. So it hopefully won't get sick and require the antibiotics. The second key hotspot I'm gonna discuss is scour and do we actually need antibiotics at that point and go through a few different papers and a few different options of what we've got. And then pneumonia. Go through the mortality and morbidity and then the metaphylaxis areas. And then we'll just cover a few extra areas at the end.

So as I said, we can't do a youngstock presentation without including colostrum. So when we think of colostrum, I think the first thing most people think about is the antibodies aspect. And this is really important to get this IgG across from the dam into the newborn. But we do have to remember that colostrum contains so so much more than just these antibodies. The pure amount of energy that the calf needs. Equally, on these cold winter days, the warmth that that colostrum can add, not being an energy sink as in if you tubed it cold colostrum, but if you can add warm, then actually, again, in a different way that adds the energy into the calf. More and more work is also showing the importance of the growth factors in microbiome that is produced by these colostrum feeds. So how in later life this can affect growth efficiency and food rate efficiencies, which are becoming more and more important and of interest particularly with the eye on sustainability and the carbon footprint in the future. So I think these are areas that will be looked into more and definitely exciting areas for the future. Also when discussing colostrum, of course we can't forget the downsides and risks of colostrum. We've obviously got the Johne's, but we've also got the general coliform bacteria, which we'll discuss. Mycoplasma and Salmonella risks.

So, starting to go into a bit more depth of the colostrum, going through the basic 5 Qs. I think this is a really good place to start and it's quite easy to get farmers to buy into. I think they quite like the idea of the 5 Qs. So we've got the quality, I think this is really important. A lot of people have thought, oh, well, heifers give poorer colostrum, but actually it does vary and we do need to measure every single sample on farm ideally. So with a Brix refractometer on farm, they're now really affordable. Quite hard-wearing even in clumsy farmers' hands in the dirty environment that it can bring, it is reliable. And making sure those readings are over 22% can be really an easy win on farms. Secondly, that the quantity given to the calf, making sure they do get the full 10% of body weight. I'm not suggesting you're weighing every calf as it's born, 'cause I think we've got a lot to do in those few hours around birth, but making sure we have got a fairly accurate estimate of birth weights on that farm and making sure we're achieving that 10% of body weight. So into the third Q, which is quickly. Really, this ability of the gut to allow the IgGs to move across from that internal gut lining from the colostrum into the blood is quite an amazing thing if we think about it, but it does decrease quite quickly. So we need that colostrum into that calf really within the first six hours if we're going to use that quality and quantity. Quietly has its place. I think this is quite important

when we're discussing with farmers to do it quite calmly and to have a plan in place. I think that's one of the key areas which we will discuss time and time again within this webinar. And then finally, squeaky clean. It just about squeezes in there as a Q. Are you giving a bacterial soup? We want these calves to be receiving all the pluses of the colostrum, not a bacterial soup. So we've harvested it cleanly, we've stored it correctly, and we're going to give it in a clean way, whether that's through a nipple bottle feeder or a tube.

So I said that was a bit of a quick tour through colostrum, but now we're onto the environment. So what environment is this calf born into to give it its best start? Well, we obviously want the cow to be clean, a clean bed, and clean colostrum, as we've said. So to try and lower that challenge level that the calf is entering. Really, some quite easy things on farm to make this achievable is to make it easy. If it's easy, it gets done. So making sure things are plastic, so it could be say pressure washed off. If they've got brushes to be used in certain areas, little things like actually tying them down, 'cause we all know brushes go off wandering on farms. And making sure the pressure wash works and say there's a tap nearby, and just little easy things like that really makes sure that these things get done. Obviously at this time of year, the winter, yes, we're going into summer now, but making sure we have got that warmth area covered. A shepherd and the sheep sort of industry would laugh if we said they didn't want to do any of their things without heat lamps, but for us, thinking about heaters, these are becoming more common. Obviously jackets I think have massively taken off in the last three to five years, but just simple things like making sure the nesting scores are good. So we are providing them with a good straw bed that they can really nestle into. And again, I said I would say this a few times in this presentation, but really have a plan in place. And if you're going there and looking, just taking pictures of these areas so that you and the farmer can discuss if they think that it is a clean enough and good environment.

So, nutrition. This is really important and it covers a lot of things where a lot of places can go wrong. Is these calves do need energy just to develop their immune system for maintenance. And obviously one of the aims of this pre-weaning phase is growth. We want them to double in weight at least by weaning. So the tradition of two litres of milk twice a day, is that enough? And I think definitely going back five years, it was still quite common, this two litres twice a day. I think more and more knowledge is getting into the farmer's press and into the farming industry to increase this and particularly people on powder, the whole one kilo of powder a day, hopefully I feel is becoming more of the norm. But really, if we are starving these animals of the energy requirements they need, then obviously they will succumb to the sickness quicker. Equally, I think traditionally we were said that weaning when they're eating a kilo of concentrate, is this enough? It's also quite difficult to assess that within a group and obviously group housing is becoming more and more common. So is this a good way of assessing? I think it's a lot better than age. I think weight is great. And concentrate intake should be the best option for when to wean. It shows that their gut is ready for weaning, but how we measure this on farm can be more challenging than it first appears. So how are we gonna do this? Well, we're gonna have a plan. Hopefully we'll pick some easy calving bulls. We'll monitor the dry cow's body condition and weight. So hopefully the calving process itself is easy. We're gonna prevent some of these diseases by having a colostrum store, which is easy to use and managed correctly. Making sure that the team is confident in how to do this, where everything is, and how to give it is really, really important. And then we're gonna protect these animals by making sure it's clean and dry and warm, and making sure that we're trying to clean and disinfect between batches or each time a pen is used.

So I'm just gonna touch on this, but farmer motivation is really important, particularly around this colostrum. I think getting the whole team together, maybe including the night milkers, if they're

gonna be involved in it or not. Going through some what if scenarios can be really useful. But there is a lot of room for improvement. Got two papers here. One based on the bacteriology of the colostrum just written in 2020, saying that over a third of the samples had high bacteria counts. This can be particularly a problem in the summer, depending on how we're storing it. So this can be quite an easy win if we take some samples and think this is the problem. Equally, Owen Atkinson in 2016 found that only 3% of farms were regularly monitoring colostrum via blood sampling the calves. So equally this can be quite a good way of getting in to see calves and see how colostrum management is going. So how can we measure these things with the measure, monitor and manage ideas? So we can take total proteins, as I've hinted at. We could take colostrum samples both for bacterial load and Brix readings. We can assess the calving cow cleanliness scores and equally the calving area. And we can take birth weights of the calves and their growth rates.

I think making sure that the bookkeeping is up to date and done accurately and regularly discussed is a great way of improving staff morale. So here are some of the targets. I'm not gonna go through them one by one because time is moving on, but there's a lot of things we can measure and monitor around that first few days of that calf. So hopefully we've made it through the first week. They're all nice and healthy. There's some calves there with their coats on, ready to go into the next stage.

So the next hotspot is scour, and unfortunately this is still really common. We've got a few of the just farmer surveys, and one stated that 10% of farmers said over a quarter of their calves were scouring. And this is a high number of farmers responded, so I think that is quite accurate. Another survey pointed out that 82% of farmers had seen scour in the previous 12 months, which isn't to be surprising at all. However, what I was surprised at is nearly half of them admitted to losing an animal in this phase due to scour. So half the farms had had a animal die because of scour in the last year. So what causes it? This is changing all the time, but this data was APHA from 2012 to 2017. And it shows that nearly half were of crypto. So this is an ever-growing problem. The next causes are the viruses. So with 29% being rotavirus and 20% being coronavirus, that's a big proportion. We do have a smaller proportion here, 7% are E. coli and 1% was other. So if we stand back from this and we're thinking, well, actually, near on 80% of these calves, nearly 90%, are caused by bacteria or being single-celled parasites such as crypto or viruses, do we actually need antibiotics? And one thing, one of the products which we can easily pick out a specific antibiotic for scour is the common oral boluses. So just sit back and think, as a practise, do you sell them? And maybe think of which of your farmers use them. And are they really required?

So looking and trying to do a bit of a paper review on this. There was one that was particularly useful, which is Gomez et al from 17. And figure five I find particularly useful, which is a bit of a flow chart of when to give what. Whether that's just non-steroidals, oral fluids, IV fluids, and also brings in the whole area of antibiotics there. He suggests that if it's got a high temperature or blood in the faeces, then antibiotics are required. I think we do have to watch cocci. So being aware of the age range of these calves, we don't want to be giving antibiotics for coccidiosis in older sort of post-weaned animals. But that could be a good reason for antibiotics which a farmer can actually assess those things. Because when the blood to faeces barrier is damaged, so when the blood is coming through to the faeces, we do want to prevent that septicemia starting. However, we have got numerous works. And this is just one saying that there is a strong correlation between anti-microbial use for calf enteritis and microbial resistance. So this is a common cause and it is linked.

So with our thoughts going towards plan, prevent and protect, what can we do? Well, we've got hygiene. I think this is really important. Limiting this exposure to the dam, particularly. Making sure that that time in that calving box is as short as possible and is as clean as possible. When they move into the calf shed, making sure that this is cleaned out and disinfected and the disinfectant covers

that cryptosporidium as this is increasingly becoming a problem with nearly half the cases being due to that. And try and batch, so an all in all out system just makes hygiene so much easier. More and more people are thinking about a once or twice a year sort of a deep clean. So moving the calves out of that shed. Yes, it's difficult for that batch, but actually it makes the rest of the year so much easier. Obviously, if you're a seasonal calver, then you sort of naturally fall into that anyway. So your sheds get a rest. But an all-year-round calving shed, it can be difficult. Colostrum has its part to play within scour as well.

So obviously, as I said, we can talk about colostrum, it's linked to so many things and if we can get that right, we can tick so many boxes. So we can discuss things such as vaccination of the dam, going through the 5 Qs again and making sure our harvest and storage of colostrum is good and correct. Thirdly is the treatment. We really wanna focus on these electrolytes. Making sure that we're still covering energy requirement. So I suggest that they often stay on milk but get extra electrolyte feeds rather than come off the milk and go onto the electrolytes. I think that can be quite difficult for the gut to heal itself when then we're under severe negative energy balance. And also what about recording fluids as a treatment? This is very rarely done on farm and it really surprises people when they start recording it how much of a problem there actually is within the calving shed. So what can we do? These are some more specifics, I guess, depending on if you've done testing and found what the problem was. We can vaccinate the dams as I've hinted at, but we do need to make sure that colostrum management is good, 'cause this is the way these vaccines work. So we don't want to be suggesting a vaccination policy if the colostrum management isn't good, because unfortunately we won't meet those farmer expectations and they might lose confidence in some of our later suggestions. And there are sort of crypto drenches as well, making sure that we're using it properly. So we want to weigh accurately, making sure that this is given as a prevention. So we don't want to be giving them when they are scouring. We need to know the hydration status and just protecting that gut lining. So making sure we are administering it after a milk feed.

So onto the measure, monitor and manage for scour. Generally, I think this is one of the poor recording areas within youngstock on farm, particularly with electrolyte use. So just to warn farmers and for you to be aware that often when you first go in and do some education and train these farmers, that actually electrolyte uses will go up. So just to be aware of that. They start recording it and it looks like it's getting worse, but actually we're just recording it better. I think looking at mortality in the first two to three weeks of life is generally quite accurate. This is generally scour, not pneumonia. So this could be a way to monitor. We can look at sales data, but obviously remember where they're buying their electrolytes from. It might not all be through the vets. And look into antibiotic boluses, as I said. I think this is a no-no going forwards, but just looking to how many sales you have for those. And again, just touching on the motivating a farmer. This is covered in one of the other modules better, but having some open questions about actually what are they worried about when they're treating a scouring calf. Is it it might die? Is it it's taking a long time? Is it that they hate tubing calves? If it's something like the tubing, that can be something you can help with in training the teams so it's not only one person doing it, which can often be quite a pressure on that person. It could be how they like to record treatments. So some people are still very paper-based and they like to scribble it in a book. Others, a whiteboard in the shed works quite well. And more and more are going onto sort of WhatsApp groups or online ways of recording on their phones. So each system and each team of people like to do things differently. And asking what they think their scour rate should be is a good starting point, because it will vary massively between farms. So here we wanted to try and create the farm some SMART targets, so something specific, measurable, attainable, relevant, and time-based. So it will vary massively from farm to farm depending on where we're starting from. Equally, I find scour to be very seasonable and variable in numbers. So if you go during

an outbreak situation which you're often called in at, just be aware that it does ebb and flow naturally. And the key areas to look into is that colostrum, hygiene and nutrition. So what could we set as our scour target? Well, one of the obvious ones is in the next month to reduce treatments by say 10%. However, as I said, be aware that after the training, electrolyte treatments and recordings actually go up, because they understand hopefully the benefits of that electrolyte treatment. Also, I hinted at the increasing fatalities or decreasing the fatalities hopefully might be a better option. And thinking that actually a lot of these things are linked to bigger problems, such as colostrum and hygiene. So is that the best place to start just by reducing treatments by 10%? What about focusing first on the colostrum and saying at the next visit we'll recap electrolyte treatments? So really focus on where you've either found out by testing or where where you believe the problems to be, and then hope that by the next visit, they will have noticed it themselves. Some places that they've got it written in their health plan, just not to give antibiotics to calves with scour unless it's been discussed with the vet. And that seems to work well. Others have more decision trees on farm if crypto is a problem.

Just while we're finishing the scour, not to forget nutritional scour. Again, fairly obviously hopefully, antibiotics aren't required for this one, but it is very, very common. So going into quite in-depth discussions on how they actually mix up the milk. So not just asking them what they think their grammes per litre is, but watching how they mix it. Different members of the team will often do it differently at different temperatures. If they're using feeders, making sure that they're cleaned properly. You can go into the milk powder ingredients and percents as well. This can be a problem particularly if we're trying to fairly intensively feed these animals at sort of over a kilo a day, then sometimes the ash levels within normal powders might be too high for the more aggressive feeding programmes. And the whole syndrome around this Peri-Weaning scour, when that gut isn't quite ready for weaning. Whether it be slugs of high volumes of concentrates being given just once a day or whether they're introduced to a different fibre source, a lot of changes can occur at that weaning time which upsets the gut and causes scour, but may or may not need treatment. So hopefully now they've got through the first three or four weeks, two or three weeks. So we've made them a resilient calf with a good colostrum, a clean environment and good nutrition, and then hopefully we've steered them around scour. So they haven't required antibiotics to this part. Even if hydration might still be required, hopefully low levels of antibiotics will be required.

So on to the third and final hotspot area, this being pneumonia. This again is a massive topic, again, being a very multifactorial disease. Some of the areas that I'm just gonna quickly discuss is nutrition, yet again. Housing, paying initial attention to the ventilation, group size and also the age range within that group. Also becoming more and more apparent as a problem could be hydration following other diseases or following transport. And then stressors. This list could be endless, but I'm just picking out some of the key ones linked to pneumonia in these pre-weaned calves. So again, this is really, really common. 98% of farmers have had a case within the last year. Looking, just like the scour, at the APHA data on this, again, between 2012 and 2017, what is causing it? I think we do have to remember these are calves that were PMed. So may have had chronic pneumonia problems rather than the first acute case. But there is quite a spread of both bacterial and virus causes here that we do need to be paying attention of. As I said, we had it on the previous slide, 98% of farmers had had a case. On a similar farmer survey, they found that again 48% of farmers, so nearly half, had had a death due to pneumonia in the last 12 months. So again, as I touched on, we've got the viral, bacterial which could be primary or secondary, I'm not gonna go into that in great depth. And also ever-increasing mycoplasma, which I seem to be finding more and more commonly, particularly on the group-housed systems and calf rearer systems. I'm not gonna go into in any depth at all in this webinar, but there are ways of testing for it. We can either do the serology, so acute and

convalescent blood samples, or the BALs or tracheal washes. There's a few different ways of trying to assess the viral load within those sort of respiratory areas. But I think what we firstly have to consider is, is it a closed herd and are these results gonna be representative of say the outbreak in a year's time or not? If they are, it can be useful. If they're not, then is this a good use of the farmer's money? Equally with a lot of the vaccines covering multiple viruses, then again, is this a good use of the farmer's money or looking at some of the other areas, might that be more benefit?

So again, talking about nutrition. I think this is really important to make these calves resilient. I touched on it in that first sort of few days, but equally, at all stages, this is important and particularly with the seasonality. So if we're looking at cold weather conditions or damp conditions, this massively alters the lower critical temperature of these calves. Equally in these cold weather environments, it increases the viral survival time within the environment. So if a calf coughs, that virus is more likely to stay alive for a longer time and meet another calf before it's dehydrated in the environment. And then we have the increasing energy levels within that calf because of the cold weather. I think what we commonly see as well is when pneumonia can follow say a scour outbreak or any other disease. We've got the energy requirements actually increasing during an illness and can push these calves further into negative energy balance. So one of the tools I use is this Herd Health Tools, which I've got a link to there, which is a milk powder calculator. So you can put in the calf weight, the weights you want to be achieving, what the temperatures are, a few details on the milk powder, which you'll easily be able to find on the ticket, how you're feeding it, and equally at that age, whether they're eating any concentrate or not. And then quite nicely in the middle at the top, you'll see that battery logo. And that will work out the energy that's being provided to that calf. So in this scenario, it's red and got no battery charging there. So this calf is having low levels of nutrition, so it's likely to be a negative energy balance. And as you can see there, predicted live weights are as low as 0.3 there. So you can play around with this. See if you want to maybe change your powder to have more protein and fats in or you might change your feeding plans. You could be giving more volume a day and play around with that. And this can be quite a nice visual way to show the farmer actually if you wanna be hitting that 0.9 kilos a day, this is how much they actually need to be eating.

Obviously, talking about pneumonia, we can't not talk about ventilation. And I think farmers' perceptions of an airy shed is quite subjective, but we do not want draughty sheds. And I think that is quite important, but it's quite difficult to assess. So when we're going into the science behind it, we want to be looking for four to six air changes an hour, which is actually quite a high sort of metres cubed per second that we're actually looking for in some of these bigger group house sheds. And we don't want draughts, particularly at that calf height. So we're looking for airspeeds of less than 2 metres per second at 1.2 metres. And that is deemed to be the sort of height of a calf's head when it's stood up. So we don't want draughts within that area. When we're thinking about ventilation for these young pre-ruminant pre-weaned animals, stack effect just won't work. We don't have the kilos and the sort of room in there pushing those temperatures up. So really, we can rely on natural ventilation, but that will only work at certain wind speeds and wind directions. So more and more are looking for positive pressure tube ventilation options. So do get advice on this. There are a number of vets of which I'm one that have gone on The Dairyland Initiative training. I think this is a great resource to use. This is an example one that I've created. So you plug in some of the sizes of the shed, how many animals are, and then you can work out where you position the holes, how big the holes are, and it can really evenly need distribute fresh air throughout the whole shed, which is what we want without those draughts. So going back to the plan, prevent and protect from pneumonia, obviously a big area of this is the vaccination. So some of the key questions is, are they actually vaccinating all-year-round, find a lot focus this during the autumn and winter when

they perceive they have a problem, but actually if you do some calculations or speak to them, then actually the problem of pneumonia is often an all-year-round. And really, consider what age is being covered and what age is at risk. So are we looking at calves maybe three to seven weeks of age being at high risk? In which case the intra-nasal vaccines are really needed so we get the cover before the risk period. Or is it more around weaning and later? In which case the injectable sort of two doses and then it being active protection a few weeks after the second dose, then maybe they would be more apt to consider. So within vaccination, making sure all calves are receiving it and it's appropriate for the risk on that farm. Also, as I said, planning and preventing using housing, so making sure the correct stocking rate. So I aim for two metres squared for the pre-weaned animals within the bedded area. And these are certain national targets. And then group size and age spread within a group can be really important. Also considering the positive pressure tube ventilation if you think this would be a help within the shed. Also yet again, discussing nutrition. So we really wanna prevent that weaning crash if we're getting pneumonia outbreaks around that time, and particularly focusing on is it seasonal and linked to cold weather stress.

So I just wanted to discuss the elephant in the room, which is why there's the symbol in the corner. But what about metaphylaxis and does it have a place? So I've done a few different vet CPD events on youngstock and it's surprising how different vets have got different lines of when this should be used and how to use it. So here are just a few comments I've got. So only give the remaining group all antibiotics when half of the group have been treated already. Some say when feed intakes drop. Other practises' protocol is we can do vet metaphylaxis but only if a vet visits and carries it out. Hoping then that this is linked to this other comment when all temperatures are taken. So I'm guessing that's linked to if temperatures are taken, then any with a high temperature are given antibiotics. Possibly ones with a lower one are given maybe just non-steroidals. And the idea of some being given different antibiotics. So a longer-acting for the ones showing clinical signs and then a shorter antibiotic for those having maybe subclinical signs. Which this is all just people that I've heard, I'm not saying any of these are right or wrong, but it just shows that there is a range of what we're doing and really we need to be trying to focus on the science, which unfortunately there is still minimal out there and which we're trying to increase as ever as we do more. Because I think one of the ways in which we can increase our knowledge of what is clinical, what is subclinical and what is not affected within the group is important. So one of the ways of identifying these non-clinical but still suffers: doing thoracic ultrasound. And here's me in a shed trying to scan some. It is a technique that once you've done it a few times, becomes quite easy and swift to achieve. And again, just using your normal linear rectal probe. So most practitioners will have the equipment, it's just using it in a different way. I think this is again another place to discuss metaphylaxis in that one of the comments was when half the group had been treated showing clinical signs, I think at that point we are quite safe, but then the rest of the group would be subclinically affected, but have we almost waited too far? Whereas if we look at the middle sort of right-hand box, if we're going in at when only 11% are clinically infected, then actually 66% are healthy. So we're going in too soon there. So I don't have an answer for this, the use of metaphylaxis, but we do have to be aware of the science that is out there. Subclinical disease does affect efficiencies moving forward, it's just how we recognise that. Because it is a viral disease, going back to first principles, does it actually need antibiotics was another question to ask ourselves within the manage, monitor and measure areas. So more and more technology is being used within these calves.

So one of the papers I found was on FeverTags. So these are used for constant monitoring of temperatures, taking temperatures every 15 minutes. The paper showed that when non-steroidals were used on their own for a first-line treatment, that 27% didn't require any further treatments. However, the remaining did require antibiotics as well. So this is an area that I think will be discussed



more and more, particularly with different non-steroidals either in milk or in water being available and being sort of targeted for that calf rearer on arrival option. But I think we have to remember our farmer skill levels if we're using it as a first-line treatment is if they're identifying them early enough. But that's just my personal preference, more work is needed in that area, I think. So how can we monitor pneumonia on farm? Well, we can use the farm's own data, hopefully at this point. Because it's antibiotics and injectables, then they should be recording this a bit more reliably than electrolytes. We can look at sales data. A lot of the antibiotics specifically used for pneumonia aren't used elsewhere, so we can actually pull them out of sales data relatively easily. And also we can't forget the vaccine sales data, so we can look at that. Other ways of monitoring is the growth rates. When pneumonia goes through a group, we can really see quite amazing stunts in growth rates. So if we've got weights on the farm, then that's a great way of overall seeing the monitoring of pneumonia and that mortality over three weeks. So again, creating some SMART targets for this, remembering the seasonality and multifactorial element of the disease can be quite hard. You might automatically think just reduce it by 25% in the next two months. That is the target. But just remember the seasonal change and is that actually achievable on farm. So as I suggest, might be changing the nutritional changing or housing alterations and maybe putting vaccination protocols in first. So maybe a SMART target might be ensuring all calves receive their intra-nasal vaccination before two weeks of age in the next month. Because we're targeting at quite an early age and on an all-year-round calving system and particularly the medium to small herds, making sure they've got enough calves going through to use the doses in a vial can be quite important and making sure that they get that vaccine before they're exposed to the wild viruses can be important.

So hopefully now they are ready to wean, they're healthy and they're gonna be efficient and productive for the rest of their lives. So a lot of work's been shown particularly with pneumonia. Once they've had the disease in their life, then actually that is carried lifelong. So if we've prevented it, then they're efficient and productive. So just to touch on some other areas which I deem to be high-risk areas, and again another elephant in the room, little symbol in the corner. So this is the dairy beef or calf rearer situation. So these are often high-risk animals. They've possibly been through long journeys. They might be dehydrated already on arrival if they've say left farm early that morning, not been fed, gone to market, maybe gone to a sorting centre and maybe not arrived till maybe even the next day but late that evening. So dehydration can be an issue. We're often mixing a lot of calves at that vulnerable age, and obviously BVD PIs are around. More and more sorting centres are testing for it, but it is still an ongoing problem. So these calves are high-risk.

So what options do we have? Well, if we think dehydration is an issue, then offering warm water and more and more are offering electrolytes on arrival and finding that useful. We do have the intra-nasal vaccines that can be given on arrival with that really quick onset which hopefully will get in before exposure, but we really want these to be vaccinated before their high-risk period, but this can often be difficult with the supply chains. And then again, just hinting at and touching on the non-steroidals on arrival. So traditionally, there have been prophylactic antibiotics used here, which is the elephant in the room. It's very easy to do this webinar and not discuss this, but I think we do need to consider it is a high-risk area and a high-use area. So what about trying to select calves, just the poorer or wetter calves? I'll also just touch on what the thoughts are between injectables versus in milk antibiotics, and then really hitting home the farm-specific and batch-specific variations. So as I've touched on, what about selecting just some poor body conditional wet calves? I think in the short-term, that could be an option, but really in the longer-term, we need to be sourcing high-quality calves for this system. A lot of calf rearers are paying good money for these calves and they really need to be arriving in top quality. What about giving animals that have signs of concurrent disease such as scour? Well, just to be aware that we've got a lot of nutritional changes happening

between the base farm where they could still even be running with a cow onto a definitely a different milk powder. So there's a lot of nutritional changes there which can cause scour. And then back to the initial question of do the scours require antibiotics anyway.

One of the others areas just to touch on is the whole injectable versus in milk antibiotics. So we could do in hard feed, but again, this is less bioavailable. If we're giving it in milk, then it's deemed to collate with the calcium, so are they getting the active fraction that they need to? On-farm mixing, whether in milk or in feed leads to poor dispersal. And so we can't ensure the even concentrations. And also make the general point that ill animals will eat and drink less. So are they actually getting the dose that those ones specifically need? One of the other questions is, is the disease pattern definitely a shipping fever? So have you got that steep spike in that first two weeks on arrival and then it gets less, or is it quite even throughout the batch? And sitting back and knowing that we have tried absolutely everything else. So vaccines are in place, nutrition we are happy with, growth rates are good and ventilation is good. Then maybe there might be certain scenarios and certain seasons and certain even individual batches when it might be required, because the overall antibiotic group for use for the whole group might be lower, but definitely going down the line of traditional prophylactic antibiotics for all calves or all arrivals, I think is something to move on from and try something different.

So how do we engage? I think the calf rearer can often be quite distant from the vets. I think the dairies have traditionally over the last few years always improved their veterinary relationship, whereas the calf rearers I think are still more difficult. I think making sure we try and invest our time into them, and one of the options is to do quite an in-detail herd health plan. So do allow time for this visit. Often they perceive the vets as just money. It's a lower charge, we want them on farm as less as possible. But this opportunity to really have some open questions such as castrations, are non-steroidals used, how is it done. If they're obviously arriving at that age, then really it should be through the vet so you know if it's being done. But considering is it even needed. If these are dairy bulls staying in a barley system, then is it needed? What are calves getting for treatment on arrival, and also asking some of the more open questions. So do calves arrive and they're already treated or do any antibiotics arrive when batches of calves arrive as well.

So this is one of the calf rearers that I work with. So hopefully if they're going into this system, they've moved to the rearer and achieved their goals. They haven't needed any antibiotics to remain to be efficient of food conversion with high growth rates, because just like the dairy cows, if we do get an pneumonia in these animals, then unlike dairy, I guess, with their milk yields dropping, it's more their food conversion rates and their efficient lean growth, which is what we're targeting. So just onto the final section of what can you do. Well, an easy place to start is to look at the antibiotic sales data. I'm definitely not technological with any of these things. So this is just my point of view for something practical and easy that hopefully you can all go away and just play with and hopefully get some useful information back and not to make it too daunting. So I think pneumonia is quite an easy place to start. Farmers often have a specific antibiotic that they use, or maybe one or two. So actually looking at that instead of looking at the whole plethora of drugs. For say the milking herd, if we focus on pneumonia, then we're only gonna need to pick out maybe two or three antibiotics. So from that, we do need to work out the kilos treated as between the different pneumonia antibiotics, the mils per calf can vary a lot. So work that out and then get some youngstock numbers. So yes, you can ask the farmer if you've got a good relationship with them. Another option is through TB test sheets or even logging on to BCMS. So we can get those numbers and then we can compare the numbers with the kilos treated and see who your highest users are. I think the number of times I've done it, you will get some surprises, but some you won't. And then just not to forget the

vaccinations. So again, you can run another sales report using your vaccines sold and compare them to the number of youngstock, which you would have already found. There's no need to work out any kilos for this, but just remember that some vaccines have two doses. So just not to double count yourself for those, but that can be useful to compare those two.

And just to touch on some not really case studies, but some other ideas. Obviously these are pre-COVID pictures, but farmer meetings can be a great place to start. They always love a free lunch. Try and have some of my hints and tips, I think, to where I've had different groups and it's worked well is to try and keep them open and actually get them talking rather than you going through a PowerPoint. It can be a lot more daunting going to a meeting with almost nothing prepared, but getting them talking is so much more powerful to the other farmers in the room. And I think that comes back to selecting the farmers you want there. So you do want some that you want to change, sort of the slower onto different ideas or ones that you know have a specific problem, but equally, you want some there or even hosting the event that are doing things well, that have maybe taken on things that you've suggested and have really seen a benefit from. So we want a mix of farmers there. Also, consider benchmarking. I have to admit, some of my groups love it and some don't. I think getting them up and chatting, it is useful. And try it, but don't be worried if it doesn't take off. Maybe dip in and out of it and just see how you go. Setting up a focus group so that they meet the same people each time might help some farmers open up, so this is a long game you're playing. Don't expect after one meeting five minutes that all their problems are gonna be solved. This is more of a long sort of two or three-year strategy that we're trying to create.

So hopefully that was definitely a whistle stop tour. As I said, I could do sort of six hours on colostrum itself, let alone the whole of youngstock and how we can alter our antibiotic use. But just to cover some of the areas we have whizzed through. So youngstock, how they use antibiotics differently and how the metrics can work. Then on to our three hotspot areas. So creating that resilient calf. Specific questions around the scours and pneumonia. And then some extra sort of high-risk areas linked to the calf rearers. I really want this to have been a practical and realistic starting point for you. So I understand that it's maybe not as paper-based and not as evidence-based as I definitely would like it to be, but I think I've tried to pick out some of the most useful and most up-to-date facts that I could find. And this is an area which is receiving a lot more interest recently. So hopefully over time, more and more papers and evidence will come out of this. So just to finish up, what are you going to do after this webinar? So set your own SMART targets. It might be to go away and look at how farmers are recording medicines. So the whole introduction to the medicine hub. Try and again make it as time-specific, so within the next week, or however you think. Maybe it might be to run a pneumonia antibiotic sales audit for your clients and invite them, select some farmers to invite to a meeting in say hopefully September when we're in a COVID-safe environment. Or it could be just to create a list of calf rearers within the next month and encourage them to have a proper, in inverted commas, herd health planning meeting. So give yourself time, create the list, and see how many you think is achievable to get that and try and improve that relationship. So let's see how we get on. There are some references at the end.

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