Audio File Name: [8.08] 02.10.17.

Date: 16th November 2017

Comments: Noisy environment

Duration: 63:51

**KEY:**

Cannot decipher = (unclear + time code)

Sounds like = [s.l + time code]

I: = Interviewer

P1: = Participant 1

P2: = Participant 2

I: So, start with, I guess, is the questions for both of you on [Organisation] and how you see your role in tackling AMR, then how that’s evolved over the last few years and how it kind of links in to the positives and the negatives of the way that policy is developing at the moment

P1: Right.

I: - which is [laughter] just to get you going to start with.

P1: Okay, well I suppose I can give an overview of some of these things, and please do chip in if I forget anything please. […]

So, in terms of antibiotic resistance and how antibiotics are used in food production, […] produce antibiotics for use in food producing animals, and […]also produce vaccines and other products that can be used to reduce the need to use antibiotics for the treatment of animals. So, for example, […] produce [s.l teeth sealants 0:01:55] that are used in dairy cattle as a way to reduce the need to treat animals with antibiotics. […]

[Background noise 0:02:12-0:02:23].

P1: So, I tried to think where I had got to, so essentially, they produce antibiotics, but they also produce vaccines and other products that are used to reduce the need to treat animals with antibiotics. I suppose in terms of policies around both antibiotics and vaccines and other products, it's important to note that a lot of the policies around what antibiotics are authorised for use in animals, and conditions around their use, so when it’s appropriate to use them, when it’s not, guidelines and so on, an awful lot of that is now being, there’s a lot of work going on at an EU level that is driving an awful lot of that, and so, that’s an important point to note.

Of course, the UK, the regulatory agency in the UK has been one of the lead organisations in that, traditionally, it’s one of the lead regulatory agencies throughout, across what’s often referred to as the EU regulatory network. So, it’s not that the EU work is separate, or distinct from what’s happening in the UK, but it’s very much going in parallel.

I suppose the other point that’s important about that is an awful lot of the products that are developed, particularly by the bigger companies, who tend to be the companies that would be more likely to develop innovative products, the bigger companies tend to be the companies that are developing vaccines rather than the smaller companies, that’s not an absolute, but it is a tendency. They will often view the market, markets across the world in chunks.

So, the EU is one chunk, as a region rather than, you know, you’ll have the EU, you’ll have Africa, you’ll have north and south America and so on. So, if, I suppose that’s a relevant point that as the UK exits from the EU, a lot of the policies around antibiotic use in animals will still be being developed at an EU level and it will be important that the UK is cognisant of that, which I’m sure the authorities here will be, I don’t have any indications to think they wouldn’t be, but nevertheless it’s going on. I don’t know, have I given you sufficient answer there, or…?

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I: Yes, I guess one thing, there’s been lots of stuff, it’s not policy yet, or it may not be, but in the O’Neill report what do you think about different economic models to encourage kind of pharmaceutical, the Dutch and –

P1 Yes.

I: Do you have an opinion, on that, or [laughter], because they don’t really say what, they just say different.

P1: Yes.

I: [Laughter].

P1: In the O’Neill review, they do talk about a lot the economic models around the development of new antibiotics. So, some of the ideas I’ve heard have been ideas such as, in that a company, if a company were to develop a new antibiotic, they would receive a lump sum payment from the authorities and then that antibiotic, because it’s new, would be kept as the very last resort antibiotic. So, it won’t be sold more [s.l officially 0:05:56], but the company who has developed it will have obtained the return on the investment via that initial lump sum payment. That’s very much a model based for a human sector, that’s not really aimed at the veterinary sector.

So, in the O’Neill review they talk about the various economic models, what they are generally taking about there is that they refer to this market failure for new antibiotics and what that essentially is, is that if a hypothetical human pharmaceutical company, I’m talking about the human sector here and now, were to develop a new antibiotic, it will be everybody will say that’s a brilliant new product you’ve developed, so we’re going to retain that for the really, really hard to treat infections. So, that company is essentially going to sell very little of it. So, it’s not attractive for them to expend gigantic sums of money in the first place to develop that product.

So, but I think that’s all, everything I’ve just said over the last 60 seconds or so is based on the human sector. In the veterinary, we don’t have any real indication that the O’Neill review and the ideas around developing new antibiotics have focused on the veterinary market. On occasions it’s been mentioned to us that, “Yes, a lot of those ideas would equally apply to the veterinary sector as they do to the human sector,” but if you actually read the O’Neill review, one of those ideas that new product development in terms of new antibiotics are very much more on the human medicine sector, rather than the veterinary sector.

I: Is it different companies that are involved in…?

P1: In the main it is, it used to be that a lot of the companies were the same, going back over 30 years ago you would have […] Now, most of the big human companies stepped away from veterinary medicines. Now, that’s not absolute, […]

P2: […]

P1: Yes, of course.

P2: They tend to be sort of divisions that are quite separate animal health focused companies that focus entirely on animal health products as well, so.

[…]

I: That’s okay, it gives me the general idea.

P2: Yes.

I: Yes.

P1: I suppose it’s probably worth mentioning at this point as well, the relative sizes of the industry. So, the veterinary medicines industry is tiny. The EU figures are that, obviously there are various ways that it can be measured, but in the EU, they estimate that the veterinary market is worth 2.5% of the human medicines market. Here, in the UK, it’s actually hard to get accurate figures of how big the human medicines market is because you have both the NHS market and you have private medicine. So, it’s hard to get quite accurate figures, but our best guess is that the UK is actually a quite strong market for veterinary medicines and it’s 4% of the human medicines [laughter], so we’re slightly, you know, in comparison to the EU average, but again I suppose one of the issues with that is, is essentially if you’re looking at developing new drugs, where you’re likely to go with very expensive research, it’s –

I: It’s difficult too.

P2: Yes, and also on the animal medicines market we’re talking about food producing animals as a whole extra suite of research that has to be done to ascertain withdrawal limits and you’re taking about residues in the food chain, which I’m sure you’ll know a lot about. So, that’s a whole extra aspect as well associated and is a major disincentive towards producing new and any new [s.l anti-body profile 0:10:31] on the market as well.

I: So, is there a push to the better diagnostics and more efficient use?

P1: Yes.

I: Is that the same companies, or is that different?

P1: So, to answer your question, there’s a lot of talk and there has been for a few years about development of better diagnostics for both human and veterinary medicine. That was in the O’Neill report and in the O’Neill, report they talk about [s.l bedside 0:10:59] testing and in animals it’s pen side testing is what they talk about, but it’s essentially being able to take a sample from a sick animal and find out within 15, 20 minutes what is causing that illness, rather than having to take samples and post them off to the laboratory and wait two or three days and so on, for results.

I: It’s just too long.

P1: Exactly.

P2: Yes, exactly.

P1: You know, in all of the production animals it’s a delay that’s generally unacceptable, I mean so there’s definitely a push towards it, […] starting to look at better diagnostics, but their main focus is veterinary medicines. So, a lot of the companies that are doing the, you know, if you go to a veterinary conference and you see the various stands of different companies promoting their services, the diagnostic companies are 99% totally different from the –

I: Okay.

P2: Maybe the cross over, it’s because such a specific area of expertise, so you’ll find companies that have massive experience, for example in developing vaccines, which is very, very niche, or developing anti (unclear 0:12:17), or perhaps nonstreroidals or whatever it is, and so you have to develop and nurture teams around those areas of expertise. So, we’re talking about in lab, microfluidics you’re talking about a lot of chemistry. That requires specialist expertise. So, I suppose some companies are quite innovative and looking in different directions are in a position to do that, and I think there’s an appetite to do that where they can, but it is a minority of them that would be in a position to capitalise on that.

[…] there is a huge demand out there I think for the veterinary and the farming community to get area diagnostics, and to help with treatment decisions as well.

I: So, this brings me to retail and retailer practices, retailer policies, in terms of things that they are doing, things that they should be doing [laughter], and whether you have any opinions that, yes, come from your side of the industry?

P2: Yes.

I: Obviously, there’s different kinds of retailers as well**.**

P2: That was what I was going to ask you, the kind of retailers you’re talking about entirely for the main ten food retailers –

I: Yes.

P2: - so the food service sector, is it?

I: Well, we’re looking at two areas. We’re looking at the big ten retailers, but also the big processing companies as well. These are our key area of focus, but if you have things to say on other ways of doing things and other forms of retail, we would be interested to know in terms of feeding back even to policy and future directions.

P1: Well, I suppose a couple of starting points I would have of that. So, there’s probably to me and tell me if I’m missing anything, great, there’s so much going on in all of these areas that it’s easy to forget about things, but to me there’s sort of two main areas that retailers are starting to get engaged on and have been for the last couple of years.

One would be around data collection on farm in terms of farms, biding data about we’re using x amount of product in our supply chain. That’s one area and the other one is around defining what is, I’m sure through the course of your research you’ve heard reference to what is known as critically important antibiotics.

So, they are the two main areas that they’re getting involved in. I’ll start with the data collection first. So, the VMD, the UK regulatory agency for veterinary medicines has been working with the different species groups, to develop data collection systems. So, in the coming years, better data is going to be gathered about on farm use of antibiotics, in different species sectors. Alongside that, we have heard that various retailers are developing their own ideas around data collection systems and then I suppose the third part to that is at a European level, the European veterinary medicines regulations, there’s new laws being developed, at the moment they are going through the EU process, and they’re going to require better data collection systems for (unclear 0:15:40). So, I suppose the main thing I would say at that one is, is that with data, the question is always around quality of how it is being prepared, you know, if you get offered this, you’re in.

[Restaurant staff talking 0:15:56-0:16).

P1: You know, if poor data is going into the system then you’re going to have poor data coming out. So, the main thing would be that, I think it would be good if that anything that is done is done well, that anything is done it would be any of their retailer ideas would be, that they would mirror what the government is requiring because what we would want to avoid was, if farmers have to provide one set of figures using one system to the government –

I: Yes.

P1: - and another set of figures and another, because my fear with that would be if they are having to do something complicated and time consuming twice, they’re more likely to do it badly. You do it once and do it properly with the –

I: From what I’ve seen, the amount of paper they have to collect and record, whilst working on a farm –

P1: Yes, exactly.

I: - my background’s in catering –

P1 Okay.:

I: - for years I worked in the catering industry –

P1: Right.

I: - and then even then, which is nothing compared to on a farm, the book of regulations –

P1: Yes.

P2: It’s significance.

I: - it’s actually impossible to do anything.

P2: Yes.

I: You have to make decisions, and so I guess that sparks my interest in terms of what the regulations say is going to happen –

P1: Yes.

I: - and what’s realistic –

P1: Yes.

I: - and actually doable.

P2: Yes, and farmers have been, most of them are involved in various different quality assurance programmes. […], but there is a huge appetite and a huge effort, within all of the different sectors right now, to try and coordinate and standardise data collection on farms.

So, they are talking to various researchers that are doing an awful lot of work on figuring out what are meaningful units to use, how does that relate to (unclear 0:17:54) data collection systems that we use so that they can tick that box and submit the data they need to, but also so that we’re not asking, as we said, farmers to do things over and again, in different ways, that don’t seem to have a lot of meaning for them. So, there’s a lot of effort about meeting your legal requirement, but also doing something meaningful on the farm in terms of collecting the right data that has good use, as well.

P1: I mean I suppose in an ideal world, tell me if I’m wrong because you’re closer to a lot of this then I am, right? In an ideal world, you would say that the farmer had to submit their data once and that that kept the retailer happy that they [s.l are 0:18:33] flying and it also kept the government happy.

I: So, you’re suggesting that that currently isn’t the case necessarily?

P2: Well, they all by law, have to keep a medicines book and that book can be a physical book –

P1: Yes.

P2: - farm book, it can be an electronic, you know, spreadsheet. So, they all have the data on farm, you know, as per EU veterinary medicines regulation, so they have that, but what you’ll find is that, depending on who is asking for data, they might be asking for it in different versions or different formats, or –

P1: All of them are recording their usage now.

P2: Yes, they are.

P1: What is not happening now, is that the usage is not being submitted to a central point, and analysed.

P2: Yes.

P1: So, if you go onto any farm, you are meant to,[…] part of the inspection would always look at the medicines records. Certainly, from my time there and, that was a number of years ago now, the vast majority were compliant with that, but it was essentially sitting on their computer, or in their book, without actually being –

I: So, it was getting the methods in place that allows it.

P1: Yes [over speaking 0:19:41].

P2: There is a huge amount of work right now happening in all the sectors.

P1: Going on with that, yes indeed.

[…]

P1: Yes.

P2: […] on the dairy, the beef and the lamb side of things, they are also trying to figure out ways in which they can practically do that.

So, a lot of it is just around the practicalities on farm, on mixed farms, and trying to figure out what the best way is to do it. There’s an appetite for using electronic, sort of various apps and software systems, but if you look at even the veterinary practice level, there’s lots of different options out there in terms of apps and software and it’s having a little bit of a think about how to get those things synchronised and, going forward, have that one sort of way in which all data can be collected and stored and shared, I think.

[…]

I: With Brexit as well, in terms of hopes and fears with regards to what on earth is going to happen next. Do you have any feelings, or has no one got any ideas? [Laughter].

P1: I mean I think in terms of, there’s an awful lot of questions around what would happen in the more general sense of veterinary medicines regulation in terms of how the, because there’s a very strong EU regulatory network, where the regulators work together a lot on a range of issues. I don’t anticipate, or I don’t see any evidence that there would be any, although it sometimes features in media reports, talk about potential watering down of standards, I don’t see any evidence of that being likely in terms of things happening regarding the use of antibiotics on farms that would not happen were we to remain a part of the EU. […] –

I: [unclear]

P1: - No, but I don’t want to, you know, [laughter], but I don’t see any evidence that this would be, of all the negatives that might arise from Brexit, I don’t think a watering down of standards around antibiotics use on farm is going to be one of them. You know, although it’s something that people might think, ‘Oh, now that we’re Brexiting, are we going to be not following the proper rules on antibiotics?’ No, I don’t see that happening.

I: Do you see, no way of knowing really, but if we’re not getting the same level of produce from the EU in terms of imports, like cheaper imports coming in that don’t have those same standards. Do you think obviously we can put in place to stop that happening, or is that outside your area?

P1: Well, that’s outside our area. That’s outside, that’s not for us to decide on. I mean as things stand currently, for produce that comes from, for argument’s sake, Brazil or Thailand, products that come from those countries that are imported into the EU, they are required to abide by EU standards –

I: Yes.

P1: - as things stand. So, in terms of how future trade deals between the UK and those countries around food, I mean, I’ve no indication or idea what will happen, I mean we don’t know.

P2: Who knows.

P1: We don’t know, that’s not something that’s in our –

I: (Unclear 0:25:19).

P1: Yes, [laughter], in our remit.

I: It’s going to take a while to sort out.

P1: I suppose the other thing though on the retail policies, and by retailers I’m using this in the broad sense of the word around processors and retailers, so, everybody who is between the farmer and their plate, lets put it that way –

I: Because that’s really, it’s that that we’re interested in, so.

P1: Yes. So, there has been a lot of discussion around critically important antibiotics in veterinary medicine and I’m afraid this is a very complicated area. So, you’ve different organisations giving their views on critically important antibiotics. So, you’ll have, for example, the world health organisation will have its view, and it gives its list of critically important antibiotics is very, very long.

I: [Laughter].

P1: Then essentially it includes most antibiotics that are authorised for use in animals, and then you have other organisations, like the world organisation for animal health, which is known as the OIE, they have a different list and then the European medicines agency, which is the regulator for both human and veterinary medicines, they have a list that, again is different from the previous ones. So, when you often hear people, it’s often talked about, where people saying about critically important antibiotics, but you almost have to follow that up by saying, “Which ones?”

P2: Which list are you talking about?

P1: Which list? So, that’s just an opening comment and because it’s so complicated, one of the recommendations of the O’Neill review was that there should be some effort made to harmonise the list because everybody is talking about slightly different things.

[…] in terms of veterinary use of antibiotics, we believe the appropriate list to follow up is the European medicines agency regulators listing and indeed the UK, the VMD, which is the UK regulators, they essentially mirror the EU’s list, you know, that they go along with, they’re in agreement with that, but that is where on occasions, over the years, there have been people, or policies developed in the supply chains around critically important antibiotics that because of the confusion that reigns they have come up with policies that are differing from each other and from the government view. Do you follow what I mean by that?

So, I don’t want to go into exact examples because it wouldn’t be fair to the parties involved, which, you know, where there have been occasions where and the point is for the vet or the farmer, they’re looking at it going, “Well, for this farm that’s supplying this process, or this retailer, which antibiotics are meant to be critical? [Laughter] and am I meant to limit,” do you follow what I mean by that?

I: Yes, for me this is exactly what we need because just for myself, as spending several months ploughing through all the policy and not getting to the end of it, particularly the Codex regulations –

P1: Yes.

P2: Heavens, yes.

I: - and I’ve been focusing most of my time to doing this, so how anybody else within the industry who has their other job to do, can keep on top of this, each week new documents [laughter].

P2: Yes, reports and EU reports are a minimum of 250 pages long and executive summaries are massive, as well.

P1: Even the summaries are long.

I: And they say we need more evidence…

P2: They do tend to say we’ve identified some gaps and, yes.

I: So, it has been tricky.

P2: It has been tricky, […] expert working group, they’re formed of experts in food safety science right across the EU and when they did a risk assessment, on their list of critically important antibiotics, they looked at the risks involved in using a certain set of antibiotics in animals and what that list was to people.

I: Yes.

P2: It’s under constant review as well, […] it’s under review and it is expert science based and it makes sense lots of risk is involved. […]

P1: I suppose the other thing from the critically important antibiotics around policy is that we believe is that the EMA expert group […], so they essentially have three groups of veterinary antibiotics that they consider critically important antibiotics. They’re called the fluoroquinolones, third and fourth generation cephalosporins and a new product was added last year based on new evidence that are called colistin, that you’ve probably seen reports on as well.

I: Yes, in the pig industry.

P1: Yes, there were issues with its use in the pig industry in China that got a lot of global coverage. So, following that they moved it to this lab and the licenses of all of those products they say, there are different phrases on the licenses that say things like, “Should be reserved for conditions expected to respond poorly to other antibiotics or where lab tests indicate that this is the product that should be used,” but around policies, our view on the critically important antibiotics is that actually the phrase that is probably worth being aware of is, they call them the, “High priority critically important antibiotics,” because you know how I said if you actually look at some definitions, just critically important antibiotics is a much wider pool, so they call them the, “High priority ones,” but we essentially are of the view that they should be used where the conditions expected to respond poorly, or the lab evidence it’s basically what is stated on the product license that, they’re the conditions that should exist throughout their use, but we don’t believe they should be banned or completely taken out of use because there are some conditions that vets need to use them to treat, you know.

Some people do put forward ideas saying, “These products should be banned,” and we don’t agree. We don’t agree unless for example, the EMA expert were to say, “Actually, at this point, the evidence indicates that this product should be removed from the market place.” If that were to be the case then of course, we accept that view, but as things stand, the vets do need them to use and they use them. The date on their usage in the UK is that their usage is very low. I don’t have the figures to hand, we can perhaps send them to you afterwards, it would be less than 5% of the three groups together.

P2: Yes, it’s a tiny, tiny, tiny percent.

P1: I think it’s more that the three, the certain fourth generation cephalosporins, the fluoroquinolones that we’ve listed, when you combine them, it’s definitely less than 5% of the total usage. So, the other issue if you banned them, is you end up using more of the remaining classes and that can increase resistance to those classes, so that’s essentially why we think you need them, but they should be used sparingly, but we do need to have access to them, so.

P2: That’s a worry as well that you’ll hear expressed by lots of leading vets in the UK. As we’re moving to a position of even more responsible use, you have vets who are aware that the less tools they have in their tool box, the more difficult positions they’re going to be put in. So, they would like to, as we’ve said, use them as per their SPC, their product sheet that you have that says what the legal sort of framework is for using that particular product, but if it was totally removed and they didn’t have the option no matter what happened, then that would be an issue for them as well, so it’s about keeping it available to use only when necessary.

I: That’s surprised me actually about seeing that a lot of the targets were about the amounts used regardless of the total amounts of antibiotics used, regardless of what they did and how important they were, taking the context out of it, it seemed really quite odd and still I think, are the targets, you know, the 50 mgs –

P1: PCU, yes.

I: - does that look at averages for individual animals does that look at flocks?

P2: It’s at the livestock level throughout the whole of the UK, yes. .

I: Okay.

P2: So, it’s an aggregate figure and to be fair, I suppose that was a target that was set down by the O’Neill as a recommendation and I think it’s probably fair to say if you speak to anybody in the livestock industry, that’s close to this argument, they will also say the same thing in that it’s very much a political issue and it’s a tool that’s use to drive a response in the industry to start thinking about responsible use, but very few people, I would say, would credibly say that the 50 mgs (unclear 0:35:03) has a very meaningful, scientific value.

In other words, if you reach 50, we’re all doing something right, you know, because there’s just no evidence for that. So, instead I think it’s been used (0:35:15), you know, economists wrote the report essentially, so they’re thinking about what could actually drive change, so I think they have used that as a tool and that’s what the industry is working towards, but in actual fact on the ground level, we’re quite close to that figure anyway, we’re very, very close to that figure in the UK.

Actually, sector level responses have been very much qualitatively looking at the response and thinking, ‘Well, what can we do in our industry, for example to promote increased use of vaccination where possible, preventative health measures biosecurity on farm.’ So, it’s been an awful lot of renewed talk about prevention, about herd health plans on farms and things like that.

So, people in the industry are looking at it in a much more-broader context. Yes, we know that the target is 50, but actually there’s actually much more qualitatively important topics to tackle, here.

[…]

I: And all of that costs money.

P1: Yes.

P2: It’s incredibly expensive.

I: (Over speaking 0:36:22).

P1: Yes.

I: Perhaps that’s where the retailers need to think again.

P2: Yes.

I: - what they could do within that with the push to cheaper meats –

P2: Yes.

I: - and bigger quantities –

P2: Yes.

I: - which –

P2: Yes, and it’s tricky because livestock keepers, I think, are largely people who are in this business and wanting to look after their animals. They’re food producers, you know, they want to produce healthy food, but also look after their animals. There’s only, as you can imagine in any business, so many inputs into that in terms of, you know, what the financials are of the situation. So, if for example, to achieve certain things you’re going to have a completely new, expensive housing system then that’s going to take some time to achieve, and in the meantime the vets are having discussions with them as to what they can do, right now.

P1: Just for context, the 50 mgs is often referred to, but just for context, the 2015 usage in the UK was at 56 mgs for PCU, so –

I: Across all species?

P1: Yes, whenever they give that figure the target is 50 mgs for PCU across all species and this is, I don’t know how aware of the backdrop to the setting of 50mgs for PCU, what is it’s developed with the European’s medicines agency [s.l ESPAC 0:37:55] and they look at in country, so if you’re going to compare, I don’t know, antibiotic usage in Iceland and in the UK, of course the UK is going to use more because it’s a far bigger country than Iceland. So, what they do is, they get livestock census data for all the European countries, and it’s not a perfect science but it gives an indication, so these are the number of animals in that country at any given year, versus the total quantity of antibiotics and that’s how they calculate it. So, which in 2015, 56 mgs for PCU and the target is 50, as you know, yes.

I: I was talking to somebody, […], and they talked about, well they talked about the difference across Europe and also about climate change in that warmer, wetter environments tend to create more disease.

P1: Well, that’s true.

P2: That’s interesting.

P1: Well, I suppose it’s both the warmer weather is potentially a factor, but you also then have, for example some of the very, very large Scandinavian countries. If you look at a map of Norway, or of Sweden, like they’re huge big countries, where things are more spread out and it can often be, you know, it can help to prevent disease spread.

I: Yes, okay.

P1: Do you follow what I mean?

I: Yes.

P1: Yes, so, that’s not the only reason, I mean there’s other reasons behind some of the good practices they have and, you know, in those countries as well, but it does give an example as to how you are going to have differences between countries and their usage based on climate, and also on the geography of the country, the population and so on.

P2: Also, what’s endemic in the country, you know, different countries have managed to eradicate different diseases. If you look at the pig industry, some of the viral diseases can be quite immunosuppressive as well, so that can have an effect as well on the animals. So, where vets can, and various sectors can try and eradicate those, but sometimes it can be really, really difficult to, you know, especially to get a whole country wide approach that’s needed in eradication happening.

So, lots of challenges and they’re quite different between different sectors as well in terms of tacking it and I think that’s why we’re looking at targets of how sectors respond. They’ve each had to kind of think from their sector’s point of view, what are the main issues and what are the most likely chance of success for various different measures, as well.

P1: I suppose a couple of other just thoughts that might be relevant, without direct answers to your questions [laughter], but just a couple of things[…] that are worth being aware of. Vaccines are, […], but in terms of vaccine development, I don’t know, we don’t know what different companies are researching, obviously it’s very confidential, but as a general message around vaccines is that a lot of the relatively straightforward to develop vaccines have been developed.

I: Yes.

P1: Yes, so it’s not, I don’t think that there’s easy to develop vaccines that nobody has bothered to develop for common infections. So, a lot of developing vaccines at work is complicated and difficult in terms of making sure you have a stable vaccine that brings about a proper immune response in the animals that it’s going to protect them. So, while obviously we would hope […] continue to look at developing new vaccines and to be, we can’t promise that they’re going to be developed, able to develop new vaccines for all the diseases that –

P2: Actually, there are some diseases that it’s almost recognised that it’s almost impossible to develop a vaccine that will do what you want it to do. I think in a way we’ve been spoilt from human examples, where you have certain childhood diseases, where you get vaccinated for and you have what’s called almost sterilising immunity that means that you will not get infected, whereas in the animal world, there’s a whole spectrum of different diseases and you’ve got lots of different vaccines for them, but there’s a whole range in terms of these vaccines, in terms of what they can and can’t do. It’s just such a complicated world, particularly on the viral side of things.

So, you know, sometimes you just won’t be able to technically develop a vaccine that’s going to be successful enough on the market so that it can’t reduce clinical signs or viral shedding to a level that would be appropriate for that market and in that case, you have to look at what other tools that you have to prevent that disease, or to treat that disease should it arise.

So, again it’s about having that toolbox of approaches and that is not only antibiotics, vaccines, but other nonvaccine immunologicals, and also things like nonsteroidals as well. So, you’re talking about pain relief for farm animals as well is an area that is developing and has been for the last couple of years and appreciating that you can do a lot with nonsteroidals and flu treatment as well.

I: Okay.

P2: So, it’s about a holistic approach, I think.

[…]

I: Is there most take up, of that?

P1: - focus.

I: Yes, the vets, okay.

P2: In agriculture, vaccine is –

P1: Yes, they would be.

[…]

P1: Yes.

P2: Again, technicalities, you know.

I: There’s a lot of them.

[…]

I: Okay.

P1: It’s really –

P2: Fish medicine is difficult and fish immunology is different to a lot of the other warm mammal immunology as well, so it’s a tricky landscape, but they’re very, very progressive.

P1: They are, absolutely.

P2: Where possible, they are all about prevention in health.

[…]

I: Can I ask a very naïve question because it’s obviously not my area, in terms of, if you vaccinate against a disease, how likely is it that just a different pathogen will come in and take that space?

P1: So, if I understand you correctly, if you’re vaccinating an animal against an individual disease –

I: Yes.

P1: - the vaccine will in the vast, vast, vast majority of the time, will prevent that animal from getting sick with that disease, does that answer your question?

I: So, if it stopped a particular disease, for instance, would a different pathogen come in, and find a niche there?

P2: Not necessarily, no, it’s not like bacterial colonisation, where you knock out good bacteria, you might bad bacteria that overthrow, it doesn’t really work like that in the viral community, but there are lots of quite clever vaccines that will be multivalent, which means you look at it clostridial diseases, which are ones that they’ve in the soil.

A lot of those vaccines have between four and seven different clostridial pathogens, so when they give them that vaccine, they’re covered by the whole spectrum of them, others are quite simply there’s just one main type, but like the flu vaccine, you do get changes over time with certain times and where possible for those kinds of diseases, they are [s.l operated 0:46:12] as well, as the serotypes become dominant, so the main forms become dominant in any one area, geographical area. […] but no, it doesn’t mean if you vaccinate for something, something else will come in. In actual fact, if you’re vaccinating an animal, it’s less likely to become ill, it will have a better immune response, better growth rates, it will feed better, it’s really only a positive thing, really.

I: And cost effective, or it depends [s.l Ailsa 0:46:43]?

P2: I think it totally depends, you couldn’t really say –

P1: Yes.

P2: - in terms of different vaccines, different numbers, different diseases, old vaccines, new vaccines –

P1: Yes, they’re going to vary, hugely.

P2: - different technologies, yes, there would be a whole range of different, different options.

P1: Yes, but I mean, that’s right, yes. I suppose the only other thing that again, probably comes up and I’m sure that’s featured in your discussions, is the question of antibiotic free productions systems, where essentially the producer, or the retailer, or the processor says, “We will assure that this animal has never been treated with any antibiotic in it’s life.” When we’ve discussed that with vets and farmers, the general feeling and I have got from people, is that they feel that this is going to be a niche system that you won’t be able to have a system like that for the whole meat counter in your retailer.

I: Given even organic methods allow necessary antibiotics.

P2: Yes.

I: [Laughter].

P2: Yes, that is the message that you obviously totally understand, but if I was to ask my mum what that means, she would have missed that entirely in terms of organic, okay that means it’s never [s.l within 0:48:06], if you were to ask her, “What if the animal needs the antibiotic?” “Well, that means you can’t give it to them.” “Well, like no, if there’s a vet in charge of the animal’s welfare, it means that if necessary it has to be given.” So, I think that’s what consumers and this would also tie into the fact that all meat is antibiotic free, because consumers don’t understand all the residue testing, the surveillance that goes on behind that. So, actually, you could label anything really antibiotic free, but don’t allow residues over an acceptable level that is deemed appropriate into the food chain and –

P1: Well, it’s the regulators that assess what is the safe level in, you know, that sets the level.

I: Have you seen much pressure, to have that antibiotic free label?

P1: I don’ think we’re seeing a huge amount of it, but you do occasionally see stories in the media, but both nationally, European and globally.

I: Particularly the US is where I’ve seen those stories coming from.

P1: Yes.

P2: Yes, and I think anywhere in the UK it’s been because there’s been that lack of, this gap in understanding of what that means, you know, and not understanding that a vet puts the animal’s health and welfare in their charge and that if that animal should become sick that’s the vet’s main priority is to treat that animal in that scenario. There’s a lack of understanding of what that physically means, but regardless of what system they come out with, they meet the same government requirements in terms of veterinary surveillance.

P1: Yes.

P2: It doesn’t really matter where they’ve come from before that.

P1: I suppose another thing I would say about, you do sometimes in this discussion hear well, if an animal becomes sick, rather than treating it with an antibiotic, that animal should be culled and not enter the food chain, that’s –

I: Don’t say that, I’m a cat owner [laughter].

P1: I know [laughter].

P2: I too (unclear 0:49:56).

I: Like I can treat it [laughter].

P1: No, sorry, I meant a food producing animal.

I: That’s just the same.

P1: Yes.

I: [Laughter].

P2: Yes, because they’re all sentient beings, right? So, you know –

P1: It also raises an ethical question that I mean, obviously, there’s a lot of discussion these days about the carbon footprint of food production –

I: Yes.

P1: - so if you had, I don’t know, a pen full of piglets that became sick with pneumonia and you were saying, if the decision was made, well these animals can never receive treatment with antibiotics, so instead of being treated they should be culled, but they are being kept alive for up to that point, and then you were essentially moving them from the food chain which I don’t think it’s ethical, and we also have the idea around animal health and welfare and, of course, if they get sick they should be treated, that’s in the law.

So, I suppose the overall message I would be giving on this is that antibiotic uses can of course be in various ways; it can be reduced and there are various things vets and farmers can do to reduce usage. I don’t think you can actually eliminate it from food production because animals are going to get sick, no matter what you do too, not always, but there is going to be a certain amount of diseases going to flare up from time to time so that some form of treatment, and the option to treat with antibiotics, is going to remain necessary.

P2: I mean they’re just like people, you know, people get colds and flus and get pneumonia and all the rest of it. So, it’s the same with animals. They don’t live in a sterile environment and I think some of the difficulty again has been keeping our (unclear 0:51:48) so removed from the land as well, you know, they don’t necessarily have an aunty or uncle or mum and dad who are farmers, so they don’t necessarily se the way that animals are raised and understand that actually they could get pneumonia like a human can get pneumonia. It’s the same things, but just a different species of bacteria, viruses, but they are similar diseases. So, they do from time to time, and then when that happens they need treatment.

P1: Well, it’s a legal requirement to treat them. If they become sick essentially the vet or farmer have two choices. It’s treat them, foot, sadly culling them is considered a form of treatment in the sense that if you fulfil the requirements of the animal welfare legislation, the option the vet or farmer has is to treat the animal, or to cull it.

P2: I think where people really struggle with that because I think we’re a welfare friendly nation and I think love their pets and I think they find that hard, you know, that they grapple with that. They just want to see animals that are treated and not left to suffer.

P1: It is, as I say, it’s just, I personally don’t think it’s the right way to do things that we would say that these animals can never be treated, you know, with an antibiotic. So, I suppose the overall message there is, is that we can reduce usage and there’s lots of initiatives, ongoing at the moment, that are going to look at that –

P2: An awful lot [laughter].

P1: - going on, but we do believe that vets and farmers are going to need to retain that access to antibiotics in the future in some form.

I: So, I guess just a quick overview, the key things that I’ve written down that you’ve been talking about, start with harmonising surveillance and so that farmers aren’t having to do repeated different sorts of collection.

P1: Harmonise data collection, yes.

I: Sorry, I’m using the policy words.

P1: Sorry [laughter].

I: Surveillance and monitoring [laughter]. You’ve talked about welfare and housing and some of the costs of that in terms of prevention; you’ve talked about kind of about investment and how it’s all focused towards human medicine rather than veterinary medicine; and you’ve talked about consumer understanding potentially creating problems around kind of pressuring antibiotic free without really understanding what that means and the impact of that. Those are the key things that I’ve written down.

P1: Yes, I suppose the only other thing that I think would be important would be the question, I suppose it probably is covered by the first one, do you know where we had the discussion about critically important antibiotics so that where different organisations are developing policies around that that they’re getting proper input into those policies, so that you don’t end up with various organisations working in the same area with slightly different policies because that just causes a lot for confusion for vets and farmers.

I: Particularly I guess if people supplying different vets and retailers –

P1: Yes.

I: - and they all have a slightly different version of the –

P1: Exactly.

I: [Laughter]. I think we’re doing a very efficient coverage of the key areas and –

P1: I’m afraid we’re used to talking about this topic [laughter].

I: - particularly kind of the what’s working and what’s not, what could be improved, what the blockages are, where policies are kind of rubbing up against each other in a slightly difficult way.

P1: Yes.

P2: Yes. I think there is an appetite right through the food chain to harmonise, in general. I think there’s always a struggle if you’re talking about potentially the retail sector and they’re all trying to do their thing, you know, they all have their stalls out perhaps doing slightly different things, but actually AMR and antibiotic resistance and use should come above all of that. It cuts across everything and actually keeping it precompetitive, basing your policies on sound science in a very standardised way will benefit everybody in the end, and I’ve not met anybody who doesn’t agree with that, it’s just making sure it happens in practice.

I: I mean on a very selfish level, I want to be able to have a hip operation when I (0:56:19) [laughter].

P1: Yes.

I: Therefore, it feels like it’s worth doing –

P1: Indeed.

P2: Yes.

I: - because it affects everybody and everything.

P1: Yes, of course and everybody and everybody’s family members and –

P2: Exactly and I think the retail industry is part, I don’t want to speak on their behalf, but I think this has been a journey and we’re moving along. Our hope is that they would absolutely see this as a precompetitive issue, something that is very important and –

I: They do say it is.

P2: They do say and it’s –

I: Sharing the data is getting towards –

[Interruption 0:56:51-0:57:02]

P2: - yes, I suppose ensuring that what they say gets put into practice.

I: Yes, to work out what they need to be in place to feel comfortable to share the data that they have because they have it, but yes, making it compatible and... what’s the word?

P1: Comparable, yes.

P2: Yes, exactly.

I: Then them feeling comfortable with it all, that it won’t go, too far, is the trick that needs to be done**.**

P2: Yes, even harmonising their on-farm practices, so their requirements for farmers as well, I think is quite important, that farmers are getting the same messages because at the end of the day there is a scientific way to address this, so for farmers to get that similar message, regardless of who they’re selling their produce to, I think is really important as well, in terms of them understanding that. Yes, we all know what we’re talking about and we all understand what responsible use looks like, and it should be the same language, you know.

I: Brilliant, shall I turn the machine off and let you (unclear 0:58:02)?

P2: Laughter.

P1: Well, before you do though, is there anything else you, have we covered, I’m trying to think is there anything? We could talk about it [laughter].

P2: We could talk about it all day.

I: So, if you want to keep talking, then do. So, my key areas were like introducing the organisation, what you do and why you do it, which was good, retailers responsibilities, that things that they’re doing that are good, the things that they could do differently, the policies and standards of implementation, what’s working and what’s helpful, what’s less helpful, how it could be changed, and you kind of covered globally as well, different models, yes, which ones are most useful and consumers and their role in all of this and their understanding of this. So, you covered my key areas, in various ways.

P1: I have just thought of something else that might be of relevance –

I: Because you know more than me, which is why I’m here [laughter].

P1: - just in terms of, I suppose it goes a little bit back to the discussion we had around the definition of critically important antibiotics and how we are seeing that our industry and vets and farmers we talk to say they want to retain the high priority critically important antibiotics for the certain niche areas they need to use them for. I suppose the other thing is that, the general sentiment in the veterinary medicines industry, is that if anyone were to develop a new antibiotic for animal use, the general feeling is that they’re very unlikely to get it authorised –

I: Okay.

P1: - because if somebody, if you look at the history of antibiotic development for human and veterinary medicine, it has slowed right down. There’s no new antibiotics being developed for either sector, and the feeling would be that is some companies, or indeed department, were to develop an antibiotic, the chances of them getting it authorised for veterinary use is very unlikely.

I: Because they would want to hold it back for potential human use.

P1: Exactly.

I: Even though they don’t know what it’s for yet.

P2: Yes.

P1: Exactly and I suppose there’s that and then there’s also, even if it were to be authorised for veterinary use, the general message is that it would be placed on the fourth choice, or fifth choice and it would be placed in this last resort category. So, you’re faced with this issue that we have a great antibiotic, but vets are only allowed to use it if absolutely nothing else will work, so how can we possibly tailor a return on an investment so, which is a similar issue as in the human sector in antibiotic development.

I: The economic incentives, they’re not really focused on the animal sector at the moment...

P1: Well, if you read the O’Neill report, the areas around incentive for product development are generally focused on the human sector, and I’m not sure that we could say it’s absolutely excludes the veterinary sector.

P2: Practically, it means that it’s just unlikely to work as a model, at all.

P1: Exactly.

P2: So, the bottom line would be that there is really no incentive for any –

P1: For new veterinary antibiotics [laughter].

P2: For food producing animals, there is zero.

I: That’s globally?

P1: Yes.

P2: Yes, very much so.

P1: Well, definitely globally, I mean especially the EU countries including the UK, but –

P2: Yes, so if you were an investor thinking about where you’ve got your money and what new products could we develop, and you were in the veterinary business, particularly food producing animals, you wouldn’t be having a conversation about health if you worked for food producing animals –

I: Okay.

P1: - you just wouldn’t, it wouldn’t make any sense.

I: [Laughter].

P2: The political landscape, the drivers, the human side, it would be team.

P1: Everybody would tell you to come us with another heading yet, basically [laughter].

P2: You would be laughed at. So, that won’t happen, so what we must do then is ensure is that what we’re using right now remains effective into the future.

P1: And available, yes.

P2: And available. So, if it’s not there we can’t use it and then it’s no longer authorised for use and you know, you remove all of the paper work and everything that has to be put in place to have that on the market, which is a huge, huge thing, but also if you don’t use them properly, it won’t remain effective as well. So, it’s about maintaining a full tool box by using it properly and having everything you need into the future, especially for farming and veterinary practices in the UK today.

I: So, I guess the issue with that, again which you’ve touched on already is that there’s UK and EU regulations, which are different to the world organisations, world regulations, and in terms of implementation and the data collection in other countries. You’ve talked about China (unclear 1:02:45) in terms of how that gets put in place globally, given that AMR doesn’t stay put –

P1: Yes.

I: - which is quite easily again, is another issue that is being tackled before it’s like...

P2: Yes. Well, I think the UK is seen as a global leader. I mean it was the UK government that commissioned the O’Neill report –

P1: That’s right.

P2: - and the VMD are taking this incredibly seriously, and looking at it on a global stage in terms of what they can do.

P1: They did a lot to get it on the agenda, the G20, the G7 and the UN general assembly. .

I: And taken that economic focus, rather than a human health focus, seems to have helped it kind of like get up the agenda as well.

P1: It has indeed.

P2: Yes, and I guess we’re in that phase now where they are delivering on what the objectives they set for themselves as well, so that’s where all the hard work is being put in right now.

P1: Yes. I think we’ve captured pretty much everything.

I: It’s been really helpful, thank you, it’s given some interesting things to think about, as well.

P2: You can always come back, you know, because you’re writing it and you want a little bit more.

P1: There is one thing actually, and you don’t need to record this.

I: I’m just working out how to stop, there we go.

**[End of Recording]**