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Committee for Agriculture and Rural Development

Bovine TB Review: Food and Environment Research Agency

The Chairperson: I welcome Johanna Judge to the meeting. Johanna, you are very welcome to the Committee. You have come the whole way from England, on the mainland. It is very good to have you here for what is a very important review — I am guilty of calling it an inquiry — of the work around bovine TB and how we can go some way to eradicating the disease in the future. We have heard from all sorts of people, and we have heard all sides of the argument. It is very good to have you here to give evidence. Do you have a presentation to give?

Dr Johanna Judge (Food and Environment Research Agency): Just a brief overview of the paper.

The Chairperson: That would be great. Please go through that, and we will ask questions afterwards.

Dr Judge: I am here to talk about the exclusion of badgers from farm buildings as a measure for reducing contact between badgers and cattle, and, therefore, hopefully reducing TB transmission between the two species.

For a long time it was thought that badgers and cattle came into contact with each other only in pasture; people did not really consider that the badgers went into farm buildings and could come into contact with foodstuffs or the animals in the buildings. Two PhD students did projects that were based on looking at farm buildings using video observation, direct observation and the radio tracking of badgers on four farms near Woodchester park, which is our study area in Gloucestershire. They found that badgers were going into buildings quite regularly. There was not really any barrier to those badgers going into the buildings. A subsequent questionnaire found that the level of biosecurity in relation to reducing wildlife entrance into buildings was quite poor on farms; very few farms considered that part of biosecurity. That led to the larger-scale project that I will talk about today. It was a three-year project that was based in Gloucestershire. We had

the aims of determining just how frequent badger visits were to farm buildings, looking at whether there were any simple measures that we could employ to reduce the contact between badgers and cattle in the buildings, and looking at whether putting exclusion measures on some buildings caused displacement of badger activity into other buildings.

On 32 farms in Gloucestershire, we put remote-sensor cameras on the entrance points to feed storage areas, silage clamps, cattle housing, yards and so on. We had those cameras on every night for at least 365 nights in a year. We had something like nearly 300 cameras out for the first year. Those were motion-sensor infrared cameras, so, as soon as something went past the cameras, they took a photo. Of the 32 farms, 19 had visits from badgers. Some of those had only one or two visits recorded over the whole year, but at the other end of the scale, about 10% of the farms had visits on 70% to 80% of nights. Badgers came on five or six nights a week. It was not just one badger, it was not just one incursion a night, and they were not just travelling through the farmyards; they were going into the farm buildings.

We also found that the visits seemed to be associated with dry weather. If there had been rain that day, we saw fewer badger visits to the buildings at night, but, if it had been dry, we saw more. Badger visits occurred throughout the year; they visited even in December and January, when badgers are generally less active. We saw that it was quite a frequent and widespread problem, so we went on to the second stage. We split the 32 farms into four treatment groups. The first treatment group was a control group, so it did not have any exclusion measures put on at all. That was so that we could say that there was not a massive increase in badger activity for other reasons or, similarly, a decrease for unrelated reasons. Eight farms had the exclusion measures put on just the feed stores, and another eight farms had them put on just the cattle housing. That was so that we could look at the displacement and see whether, if we protected some buildings, the badgers would go into other buildings more frequently. We then had the lucky eight farms that had their whole farms protected. The exclusion measures were very simple: they had to be simple, practical and easy to install. They were mainly things like sheeted metal gates, roller doors, some electric fencing and the addition of metal sheeting to rail fences and rail gates. We found that it was important to have a gap of less than three inches at the bottom of any of the measures, otherwise the badgers would still be able to get under.

We put those measures in place and then we ran the cameras for at least 365 days on each of the farms to see what effect those measures had on the level of badger visits to those buildings. We found that, when the measures were in place and when they were properly used, they were 100% effective in stopping badgers going into farm buildings.

Throughout the second year, a badger got into a building only 58 times, and that was because a gate or door had not been closed, the electric fencing had not been on, or something like that. When the measures were used properly, they were 100% effective. We also found that having the measures on the buildings reduced the level of visits to the farmyard as a whole. Therefore, we had less observation of badgers walking through the farmyards. We also found that, if the measures were just on the feed store, it reduced the level of visits to cattle houses and vice versa, which was a bit surprising. Therefore, it seemed to have some sort of protective effect on the buildings that you did not directly put the measures on.

The main conclusions were that the measures were very effective at reducing the level of badger visits although, obviously, they had to be properly maintained and used at all times. We found that we had a bit of a problem with farm compliance, in that farmers would not always use the gates. We put all the measures in place for the farmers who agreed to take part in the study, and we paid for them all. However, some of the farmers did not use the gates one night during the whole year, even though they knew that they were getting badger visits to the buildings. So, we discovered that some sort of education about the frequency of badger visits to farm buildings was necessary.

The Chairperson: Thank you very much. I read your paper, and I was struck by the fact that the cost of applying those measures to the farms ranged from £604 to £12,000, with an average cost of just over £4,000. The average cost of applying exclusion measures to both cattle housing and feed storage areas was £3,840 for each farm. That has been derived from a relatively small sample size of eight farms.

Dr Judge: Yes.

The Chairperson: If you were to take that over a longer period, and you were to take a UK-wide or province-wide average for Northern Ireland, England and Wales, how would those figures change? Have you done any research on that?

Dr Judge: It is very difficult to say. I am sure that I do not have to tell any of you who are farmers or who have been on farms that every building on every farm is different. Quite often, every gateway to every building is slightly different. Therefore, there is a lot of customising. Some of it is very small and it is just a case of adding an extra strip to the bottom of a door, or suchlike. It is very hard to give an average price. For example, for the lowest cost of £600, we simply had to put on two new solid gates, whereas on the farm that cost £12,000 we had to secure something like 32 entrances to buildings. It really depends on the size of the farm. It is possibly easier to put the measures in place on new farm buildings and take into account the gaps at the bottom of the doors and the concrete aprons that help to ensure that the badgers cannot burrow underneath. Unfortunately, it is very difficult to give any estimate as to how much it would cost on a wider basis.

The Chairperson: You mentioned that, even when the work was done, only 32 of the 40 farms proceeded to the second phase of the experiment. Even though you had paid for the work and it was done, some of the farmers did not use it. Why do you think that was? I suppose it was very frustrating.

Dr Judge: It was very frustrating for us. The majority of farmers used the measures and, when we spoke to them about it, they said that, at the beginning, they found it a bit difficult to remember to shut the gates. If it was a rail gate that was already there and we just put metal sheeting on it, they always shut it anyway. However, the extra gates that they had to shut caused the difficulty. The farmers who used it said that, once they started getting into the habit of it, after a week or two it was just that: it was habit. The other famers, I think, never really gave it a chance to start off

with and they never took that extra 10 or 15 minutes on the day. We really tried to ensure that it did not add any extra work to the farmer's day, because, as we already know, they can be quite long.

The Chairperson: With regard to the experiment, it is OK to have an adequate gate, but what if the perimeter of your building is flawed or has gaps or holes in it? How big an issue do you see that being on farms? Maybe you do not have experience of that in Northern Ireland, but on farms in England, is it the case that there are holes everywhere in barns that can create a risk?

Dr Judge: It varies from farm to farm, but we had some farm buildings that were in quite a bad state of repair. However, when it came to things like holes, we just put a small piece of aluminium sheeting over it and that was enough. So, yes, if you have any weakness in your building — for example, if you have sheeting that is not fixed down and that a badger can get underneath, or if you have holes in the wall — that is dangerous. For example, on one of the farms, a bull broke down one of the walls and it was never replaced, so, even though it had secure measures on the doors and so on, it was useless because badgers could still get in and out of the hole that the bull had made. So it is an issue and, when you put in such measures, you have to check the perimeter of all your buildings to make sure that there are no small gaps that badgers can get through. That is the other issue: many people are surprised at just how small a gap badgers can use to get into a building.

The Chairperson: I have spoken with the Committee about trying to incentivise farmers to install the measures of which you speak. An incentive might be wrapped around a farm modernisation scheme, or something of that nature. Is there anywhere in the UK that has such a system specifically for the reduction and eradication of TB or another disease?

Dr Judge: I do not know of any incentives. I know that in the Welsh intensive action area, all the farms have to undergo a biosecurity check every year, which is not purely about badger/cattle biosecurity, but it incorporates some of the ideas from this project. As for elsewhere, I am not sure. I am certainly not aware of an incentive for farmers to do that. The Department of Environment, Food and Rural Affairs (DEFRA), the National Farmers Union and the Welsh Government have all organised farmer advice events, where they have asked me and an animal health person to speak and give advice directly to farmers to get across the message that those measures can make a difference.

Mr McMullan: How many farms were tested? Was it 32?

Dr Judge: Yes.

Mr McMullan: Were any of those farms in a hotspot?

Dr Judge: The whole county of Gloucestershire is a hotspot area.

Mr McMullan: Had any of those farms contracted TB?

Dr Judge: None of the farms in the study had never had TB; they had all had TB at some stage or another. Some of them went down with TB during the course of the project, but we were not specifically looking at the effect of the measures on the likelihood of a TB breakdown, mainly because, in order for it to be statistically significant, we would have had to observe thousands of farms or carry on for a number of years. Even if the measures stopped all the TB breakdowns in those 32 farms, it would not have been powerful enough to pick it up in a statistical analysis.

Mr McMullan: Did you note what time of year the cattle on those farms contracted TB?

Dr Judge: We did not look at the TB breakdowns in this project.

The Chairperson: You monitored the movement of badgers in the winter months: that brought up different results, did it not?

Dr Judge: Badgers entered the buildings throughout the year, and we had badger visits to buildings every month. There were fewer in December and January, but badgers are naturally less active in those months. However, there were still quite a few visits in those months. Throughout the summer, the badgers went in quite frequently. They did not just enter the buildings in one period of the year.

Mr McMullan: Was it at the time of the year that cattle were not in the sheds?

Dr Judge: They went into the buildings, both into cattle housing and feed stores, when the cattle were not in the sheds and when they were in the sheds as well.

Mr McMullan: Were the badgers tested?

Dr Judge: No.

Mr McMullan: I have one other question; come back to me in a minute.

The Chairperson: No problem. I read somewhere — I cannot remember where — that rainfall made a difference, too. Could you explain that?

Dr Judge: We found in this study and in the two previous smaller studies that there was a correlation between the level of badger visits and the amount of rainfall in a day working up to the evening. If it had been raining during the day, there were fewer badger visits to farm buildings. If it had been dry during the day, there were more badger visits to farm buildings. We hypothesise that that is because, when it has been raining, the ground is easier to dig and it is easier for them to get earthworms, but, when it is harder, they go into buildings more frequently to get the readily accessible feed. It is a bit like getting a takeaway rather than making your own food.

Mr McMullan: What was the geographical spread in miles or kilometres of the study on the farms?

Dr Judge: It was over the whole county of Gloucestershire. I do not know how big Gloucestershire is. It was not a huge distance; the furthest farm was probably only about 40 miles away. It was quite a small geographical area.

Mr Irwin: As a farmer, I have some understanding of the problems. You said that some farms have a number of entrances, and, coming up to 10.00 pm and when in hurry to get to bed, a farmer might not feel like closing 20 or 30 entrances. You can understand that.

It is useful to get the statistics. There are cattle drinkers and cattle troughs in fields, and badgers are out in the fields all the time. So, the problems will not be in the farmyards only. You will have problems in both areas. While it would be good to keep them out of farmyards, I am sure that, in some farmyards, there are not many badgers or no badgers at all. So, to spend all that money to try to close them off is not realistic either. I would have thought that, before you go down that route, you would need to do a risk assessment of the badgers in the area. Is that right?

Dr Judge: Yes. The measures that we talk about are of use only if you get badger visits to your farm buildings. At the moment, we are researching a way of determining which farms are more likely to have badger visits so that you can focus your exclusion measures in that way. As I said, all 32 farms were in Gloucestershire, which is a hotspot area for TB and has one of the highest badger densities. So, in some ways, the surprise was that 13 farms did not have any badger visits at all. Following on from this piece of work, we have got further funding to try to determine which farms are more likely to have badger visits so that you can have a cost-benefit assessment of whether your farm is likely to benefit from having those measures installed.

Ms Boyle: Thank you, Johanna, for your presentation. I know that we are talking about badgers, but, in one of the introductions, it was said that cattle come into contact with rodents and rodents attack predators. I am just curious about whether any studies have ever been carried out in respect of the link between rats and different rodents?

Dr Judge: Previous studies have looked at whether bovine TB is found in any mammal species that we have in the UK, and that has been found to be the case. However, we found that there was a very low prevalence with rodents, and they were not seen to be a particular risk in terms of onward transmission to cattle.

Mr Byrne: I thank Jo for the presentation and the paper. In relation to biosecurity on farms, are you making any recommendation or observation about whether metal sheets or electric fences are better?

Dr Judge: Electric fencing is very effective against badgers, but, in order for it to be effective, fences have to be very low to the ground. Therefore, we recommend a three- or four-strand electric fence, with the lowest strand being just 10 centimetres off the ground, another at 15 centimetres, another at 20 centimetres and, if you want, another at 30 centimetres. The problem with that is that it takes a lot of maintenance.

We developed a retractable electric fence so that you could have a reel system and pull it across, and, in the morning, you could put it back in, and it would roll up nice and neatly. However, even then, if silage is dropped on the floor or there is a build up of mud, it can affect the electric fencing. Therefore, while it is very effective at keeping badgers out, I suggest that you are better off looking at solid sheeting, roller doors or feed bins. If you cannot protect the whole feed store, you could put the feed into lidded metal bins. That would be easier to maintain than electric fencing.

The Chairperson: I have a number of questions around the technology with regard to feeders and apparatus that is used on the farm both in the houses and in the fields. What experience do you have of any new technology that is badger proof or bovine TB proof? Is there work being done there?

Dr Judge: There is a little bit of work being done. I have been involved in some discussions with manufacturers of agricultural gates. Some of the things that have been suggested but have not been properly tested yet are having roller bars on the edge of troughs. Badgers are very good climbers, but, if you had a roller bar, they would be unable to get purchase and would fall off. However, the difficulty we foresee with a roller bar is that if a cow bangs into it and dents it, it will not roll any more and will not be effective. There is also retractable electric fencing. I believe Hotline is now considering making that as a ready-made product. We got all the gates from IAE and gave them feedback about making bigger gates, and we used some wheeled sheeted hurdles, so that the gaps at the bottom are smaller. Therefore, all those things have been discussed, but I am not sure whether they are actually going to do them.

There have been lots of suggestions about various methods and technologies that you could use, such as electrified mats and automatically closing doors, but the difficulty is the cost involved. The more technologically advanced you get, the more likelihood you have of it not working. I

recommend using a simple sheet and putting solid gates on. You do not have to replace all your gates; you can just sheet them if you have extra corrugated iron. It is quite cheap to buy aluminium sheeting rather than replacing all your gates with more expensive gates.

Mr McMullan: There were 13 farms with no visits at all. Did you look and see where those farms fitted into the cluster of the 32 farms?

Dr Judge: By "fitted into", do you mean geographically?

Mr McMullan: Yes. Were they on the outside?

Dr Judge: No, they were spread across the whole area. The preliminary work that we have done does not seem to indicate that it has anything to do with farms being in a different geographical area. We surveyed in a 500-metre radius around each farm, looking for signs of badgers and badger setts, and we found badger setts near these farms, but the badgers were not going on to the farm or into the farm buildings. There is no quick, simple answer.

At the moment, we are looking at what may be attracting or stopping badgers from going on to the farms. The very early results indicate that it is something to do with the elevation of the farm, the size of the farm buildings, the farm footprint and how busy the farms are. Farms that have people there 20 hours a day are less likely to have badger visits than the smaller farms that have people there only a couple of times a day or during the daylight hours. There was no simple geographical spread of farms that had badger visits and those that did not.

Mr McMullan: Were the farms that were getting the most visits dairy or beef farms?

Dr Judge: Of the three farms that had visits on over 70% of nights, two were beef farms and one was a dairy farm.

The Chairperson: I want to ask about the technology side of things, although this might sound daft. Are there any investigations into instruments that could prevent badgers from coming on to the property, using noise or smell?

Dr Judge: We looked at a variety of potential ways to reduce badger visits. Before we started this project, one of my colleagues at the Food and Environment Research Agency did a small experiment with sonic deterrents, which have a high-pitched sound that animals can hear but humans cannot. He put bait points with peanuts out in a field and got the badgers used to coming

to them, and after a few days he started setting off the sonic alarm. He found that it was actually an attractant, because as soon as they heard the sonic alarm, they associated it with the peanuts and made their way to the bait points.

The Chairperson: Like a dinner bell.

Dr Judge: It might have other uses, but it did not make any difference in keeping badgers away. Similarly, there was an idea that squirting the badgers with water might deter them from coming into certain parts of farms, but we found that that had no effect at all.

A lot of people said that because their dogs roamed the farmyard at night, the badgers would not come in. However, every single farm involved in the project had dogs on the premises, many of which were roaming loose at night, and it made no difference at all. We have a video that shows six badgers eating from a feed store but scattering when an Alsatian came in, but half an hour later they are back happily eating again until the Alsatian comes in again, and this happened four or five times a night. Those sorts of things were tried and were found not to work.

We also tried mesh fencing, which we have seen being advertised as badger-proof. We found that it could not be dug in far enough for the badgers to be prevented from digging underneath it. In some cases, because they are very good climbers, they can just climb over it. We tried a variety of measures, but the simple solutions such as sheeted gates, metal feed bins and roller doors proved to be the most effective.

The Chairperson: Is there anything else from your paper that you would like to add that we have not covered in our questions?

Dr Judge: I do not think so. We have covered most of the points. At the beginning of the study, we found that farmers, although they may have been aware that there were badgers in the area, were adamant that badgers did not go into their buildings. There is a need to educate people that badgers will go into farm buildings and that it should be regarded as a risk.

We also found that videos recorded as part of the PhD projects showed that badgers and cattle were coming into very close, almost nose-to-nose, contact with each other in farm buildings. However research done in the pasture environment — for which the animals wore radio contact collars that registered when they came within a certain distance of each other — showed that it was quite rare for a badger and a cow to come into close enough contact for us to think that transmission could occur. So, potentially, there may be more of a risk of transmission in buildings than in pasture, although there will obviously be more urine, faeces, and so on, in the pasture.

The Chairperson: There are no other comments, so thank you very much for your time. Your evidence has been valuable to the Committee's work and it has been a pleasure to listen to your expertise on the subject.

Members Present

- Frew, Paul (Chairperson) (/Your-MLAs/List-of-MLAs/Frew-Paul/)
- Byrne, Joe (Deputy Chairperson) (/Your-MLAs/List-of-MLAs/Byrne-Joe/)
- Boyle, Michaela (/Your-MLAs/List-of-MLAs/Boyle-Michaela/)
- Irwin, William (/Your-MLAs/List-of-MLAs/Irwin-William/)
- McCarthy, Kieran (/Your-MLAs/List-of-MLAs/McCarthy-Kieran/)
- McMullan, Oliver (/Your-MLAs/List-of-MLAs/McMullan-Oliver/)
- Swann, Robin (/Your-MLAs/List-of-MLAs/Swann-Robin/)

Witnesses

Food and Environment Research Agency:

Dr Johanna Judge