



**Cynulliad Cenedlaethol Cymru  
The National Assembly for Wales**

**Yr Is-bwyllgor Datblygu Gwledig  
The Rural Development Sub-committee**

**Dydd Iau, 20 Medi 2007**

**Thursday, 20 September 2007**

**Cynnwys**  
**Contents**

- 3 Cyflwyniad, Ymddiheuriadau a Dirprwyon  
Introduction, Apologies and Substitutions
- 4 Ymchwiliad i TB yng Nghymru: RSPCA a'r Ymddiriedolaeth Moch Daear  
Inquiry into TB in Wales: RSPCA and the Badger Trust
- 24 Ymchwiliad i TB yng Nghymru: Grŵp Gwyddonol Annibynnol  
Inquiry into TB in Wales: Independent Scientific Group
- 36 Papur i'w Nodi  
Paper to Note

Cofnodir y trafodion hyn yn yr iaith y llefarwyd hwy ynndi yn y pwyllgor. Yn ogystal,  
cynhwysir cyfieithiad Saesneg o gyfraniadau yn y Gymraeg.

These proceedings are reported in the language in which they were spoken in the committee.  
In addition, an English translation of Welsh speeches is included.

**Aelodau'r pwyllgor yn bresennol**  
**Committee members in attendance**

Mick Bates	Democratiaid Rhyddfrydol Cymru Welsh Liberal Democrats
Alun Davies	Llafur (Cadeirydd yr Is-bwyllgor) Labour (Sub-committee Chair)
Alun Ffred Jones	Plaid Cymru The Party of Wales
Brynle Williams	Ceidwadwyr Cymreig Welsh Conservatives

**Eraill yn bresennol**  
**Others in attendance**

Rob Atkinson	Adran Bywyd Gwyllt, RSPCA Cymru Wildlife Department, RSPCA Cymru
John Avizienius	Adran Anifeiliaid Fferm, RSPCA Cymru Farm Animals Department, RSPCA Cymru
Lorraine Barrett	Aelod Cynulliad, Llafur Assembly Member, Labour
Yr Athro/ Professor John Bourne	Cadeirydd, Grŵp Gwyddonol Annibynnol Chair, Independent Scientific Group
Steve Clark	Cadeirydd, Grŵp Moch Daear Gwent Chair, Gwent Badger Group
Trevor Lawson	Cynghorydd Materion Cyhoeddus, Ymddiriedolaeth Moch Daear Public Affairs Adviser, Badger Trust

**Swyddogion Gwasanaeth Seneddol y Cynulliad yn bresennol**  
**Assembly Parliamentary Service officials in attendance**

Joanne Clinton	Dirprwy Glerc Deputy Clerk
Dr Virginia Hawkins	Clerc Clerk

*Dechreuodd y cyfarfod am 9.59 a.m.*

*The meeting began at 9.59 a.m.*

**Cyflwyniad, Ymddiheuriadau a Dirprwyon**  
**Introduction, Apologies and Substitutions**

[1] **Alun Davies:** Diolch yn fawr a chroeso. Hoffwn ymddiheuro am yr oedi wrth i ni ddechrau'r cyfarfod hwn. Yr oedd yn rhaid i ni drafod busnes yn breifat. Ymddiheuraf am hynny.

**Alun Davies:** Thank you and welcome. I wish to apologise for the delay in starting this meeting. We had some private business to discuss. I apologise for that.

10.00 a.m.

**Ymchwiliad i TB yng Nghymru: RSPCA a'r Ymddiriedolaeth Moch Daear**  
**Inquiry into TB in Wales: RSPCA and the Badger Trust**

[2] **Alun Davies:** Dyma'r ail gyfarfod fel rhan o'n ymchwiliad i TB yng Nghymru. Yn ystod y cyfarfod ym mis Gorffennaf yn Sioe Frenhinol Cymru, bu inni glywed tystiolaeth gan yr undebau ffermwyr a'r Gymdeithas Tir a Busnesau Cefn Gwlad. Symudwn ymlaen yn awr i glywed tystiolaeth gan y Gymdeithas Frenhinol er Atal Creulondeb i Anifeiliaid a'r Ymddiriedolaeth Moch Daear. Ar ôl yr egwyl y bore yma, byddwn yn cyfarfod yr Athro John Bourne. Hoffwn ddechrau drwy eich croesawu i'r cyfarfod. Gofynnaf i chi gyflwyno eich hunain a chyflwyno rhai sylwadau i agor eich tystiolaeth. Bydd gan yr Aelodau gyfle wedyn i'ch cwestiynu ar eich tystiolaeth.

**Alun Davies:** This is the second meeting as part of our inquiry into TB in Wales. During the meeting in July at the Royal Welsh Show, we heard evidence from the farmers' unions and the Country Land and Business Association. We will now move on to hear evidence from the Royal Society for the Prevention of Cruelty to Animals and the Badger Trust. After the break, we will meet Professor John Bourne. I will start by welcoming you to the meeting. I ask you to introduce yourselves and to make a few comments in opening your evidence. Members will then have an opportunity to question you on your evidence.

[3] **Dr Atkinson:** Thank you for inviting me to the meeting. My name is Rob Atkinson, and I am head of the wildlife department at the RSPCA. I have a background in science; I have a PhD and a Masters degree in science. I have studied a number of territorial species, including badgers to an extent, and I come from a farming background. I am going to ask John to give a summary of our presentation.

[4] **Mr Avizienius:** Thank you and good morning. I am deputy head of the farm animals department at the RSPCA. I have a background in farming; I have worked largely as a stockman and also as a farm management consultant. For the past 11 years, I have been a member of the RSPCA farm animals department, and, as I said before, I now hold the post of deputy head. We are grateful for the opportunity to talk to the sub-committee today. We recognise the seriousness of bovine tuberculosis for all those involved. As much as anyone else, we would like to see a coherent way forward in tackling the disease. With this in mind, we support the conclusions of the final report of the independent scientific group and believe that the peer-reviewed science of the report is sound and provides us with a clear steer as to the way forward. Lord Krebs, in his inaugural speech at the House of Lords, stated that culling is not a viable policy option and that there is no wriggle room. Obviously, there are those who still disagree with the conclusions of this report. We see the way forward, as stated in our presentation to the committee, as being an improvement in the sensitivity of the diagnostics and an increase in biosecurity. I am not convinced that there is currently any evidence that we have really given the biosecurity issue due consideration in the field. Recently, a poll in *Farmers Weekly*, in which farmers answered a questionnaire on biosecurity, concluded that 82 per cent of farms were falling short in biosecurity. I think that over 30 per cent of the respondents actually said that they never gave biosecurity a second thought, which is quite worrying.

[5] In terms of the second part of our submission and the progress of the previous Environment, Planning and Countryside Committee's recommendations, I am not sure that some of these are easy to quantify, because the follow up to some of the proposals was in the hands of the TB action group, which has been in abeyance since February, which I believe is a mistake. Also, some of that committee's proposals are quite difficult and unrealistic. So, giving you some opinion as to their progress is not easy. I believe that the most successful part of the suite of recommendations has been the setting up of the TB action group, because it drew on all aspects of those concerned with the disease, notably wildlife, animal welfare,

farming and veterinary interests. To date, it has worked very well, and has come up with a very innovative and unique set of proposals in developing the intensive treatment areas. That is unique to Wales and, again, I feel that it was a bit remiss not to have had continuity on this, because a host of things have come out of this set of proposals, such as a biosecurity scoring tool that can be transposed into other farm animal disease areas. That is, as I have said, unique to Wales. That is the nugget at the heart of the paper that we submitted to the sub-committee, and we will be happy to answer any questions on it.

[6] **Mick Bates:** Thank you for that opening statement and your written evidence. On the basis of that, how would you like the Welsh Assembly Government and the UK Government to respond to the independent scientific group's report?

[7] **Dr Atkinson:** They need to take the recommendations on board. A few of the main conclusions were that all aspects of cattle husbandry deserve attention, that the geographical spread of tuberculosis at the moment can be contained, and that the increase in the incidence of TB can be decreased using only cattle measures. That is one of the most important take-home messages. The second message is to reject the idea of a badger cull, because it will only make things worse. That is one of the first ideas that they need to throw out.

[8] **Mick Bates:** That is a very clear answer. What do you believe were the main strengths of the randomised badger culling trials that were undertaken by the independent scientific group?

[9] **Dr Atkinson:** One was its sheer size and scientific rigour. It was probably the biggest field experiment that has ever taken place in the world. It was elaborately planned and independently audited, it covered a vast area, and the statisticians were absolutely top notch. One consequence of the rigour of the approach is that all of the work has been published in top-quality peer-reviewed scientific journals, including the *Proceedings of the National Academy of Sciences of the United States of America*, *Nature* and the *Journal of Applied Ecology*—all the top ones. There have been at least six or seven from that group alone, and endorsed by many other independent studies. There has been scientific rigour. As a scientist, these are some of the strongest results I have ever seen.

[10] **Mick Bates:** What about the results of, say, the Thornbury trials? Do you think that those results were pretty strong?

[11] **Dr Atkinson:** Thornbury was done a long time ago when the world was a different place. There was a certain amount of isolation of Thornbury, by roads and a river. Even then, there was still an incursion of badgers afterwards, and one thing that people may not know is that the badgers had to be re-trapped more than 500 times over five years—an enormous amount of trapping effort went into that one.

[12] **Mick Bates:** Fine, but the incidence of TB was reduced to zero, was it not, from those trials?

[13] **Dr Atkinson:** John, do you know the answer to that one?

[14] **Mr Avizienius:** I do not have—

[15] **Mick Bates:** I think you will find that it was. From the figures, TB is increasing at an alarming rate; however, I am sure that other Members will take up that issue. Finally, on this section, what new evidence has the ISG given us, and why do you think that it is valuable?

[16] **Dr Atkinson:** Quickly going back to Thornbury, the ISG supported the results of Thornbury, to an extent, because it did say that if you cull out, in one of these proactive areas,

you will reduce the incidence of TB in that area. That is quite clear. However, what you end up doing is increasing the incidence of TB outside the area, so who knows what was going on outside the Thornbury trials? There is nothing contradictory between Thornbury and the ISG results. I think that your question was about what new results the ISG—

[17] **Mick Bates:** What new evidence has it given us?

[18] **Dr Atkinson:** It is the idea that badger ecology has to be taken into account. If you disturb animal populations by culling, you increase the mobility of the animals that are left and the animals that are outside. That could actually be predicted to produce an increase in disease, and that is what the study found as well.

[19] **Alun Davies:** I am interested that you said, Dr Atkinson, that the ISG report is based on sound science. I used to work in the nuclear industry, and we spent a lot of time over the years clearing up the damage caused by sound science. It is fair to say that there are a number of different views on any issue of a scientific finding. Certainly, farmers' unions, who were with us in July, dismissed the ISG report and said, 'We are simply not going to accept it'. How would you react to those criticisms?

10.10 a.m.

[20] **Mr Avizienius:** Is it all right if I refer to the document? We talk about sound science and we talk about evidence, and I think that the whole ethos and the philosophy of the Welsh TB action group, and the whole GB approach to the control and possible eradication of this disease, has always been stated as being based on sound science, that is, evidence. We can give anecdotal evidence, and I dare say that whoever opposes the report can give anecdotal evidence, but this is the best, most robust study that we have, and if we choose to ignore it we could make the issue worse.

[21] I also put it to you that if the evidence had gone the other way—that culling badgers was the way to go—some of the critics of the report would have said the opposite, and said that it was a sound report.

[22] **Alun Davies:** Would you have accepted it, had it said that?

[23] **Mr Avizienius:** We have said all along that we would go along with whatever the science says. I have said previously at the TB action group that if the science shows that culling badgers has a positive effect on reducing the disease in cattle, it is my job to go back to the RSPCA trustees and explain that point to them. They would then make the decision on the policy.

[24] **Alun Davies:** Before I bring Brynle Williams in, I just wish to follow up a point. In your written evidence, you say that you want to see a holistic approach taken. 'Holistic' is a word that is common across all the written evidence that we have seen. As part of such an approach, you seek to balance cattle and wildlife control. Can you explore for us and expand on what you mean by 'holistic' and 'wildlife control'?

[25] **Dr Atkinson:** I shall kick off and then I shall refer this to John. When we talk about taking a holistic approach, we mean that we want to change the emphasis away from always talking about badger control. That is the impression that has been given, and in the groups that John has sat on, there is certainly a tendency to focus on what appears to be a straightforward, easy solution that produces some sort of visible result. That has been to the detriment of other aspects of TB control, which we believe, and that the independent scientific group has said, are much more effective. By taking a holistic approach, we do not mean to ignore badgers, but to focus more on the other aspects that would be more effective.

[26] **Mr Avizienius:** I would corroborate that. We have always taken the view that badgers are obviously involved in this disease. We have also taken the view that we need to know the best way of controlling the wildlife vector as well. We have relied on the expertise of those who have been tasked with producing the various reports. We look at the evidence contained in those reports to inform our policy. We are a welfare protection organisation, not a badger protection organisation. We care about cattle and other species as much as we do about all the wildlife species involved.

[27] **Brynle Williams:** I have a couple of points. Please bear with someone as simple as me. Taking a holistic view, we would deal with all aspects of the problem, as you have pointed out, yet you have said that farming biosecurity needs to be tightened dramatically. If you are taking a holistic approach, one aspect would go with another. What can the agricultural industry do to tighten its biosecurity? I have a further question following your answer.

[28] **Mr Avizienius:** I have been on farms where there seems to be a sense of resignation that nothing can be done about improving biosecurity. However, there are simple things that can be done that farmers whom I have visited have not even considered as coming under the remit of biosecurity, such as keeping feed stores that can be closed shut. There are many other simple things that can be done.

[29] I know that, out in the field, it is very difficult to separate badgers and cattle. People talk about fencing off badger setts, and no-one is saying that it is easy, but previous debate on the issue has not even considered that, and so we need to start considering such things. In order to do that, the TB action group has invited local vets to get involved. We have canvassed their clients to fill in a questionnaire on the various aspects of biosecurity, so that a biosecurity score can be arrived at and an action plan taken into consideration with the farmer's agreement. Every farm will be different in the issues that it has to deal with, and nobody is saying that it is easy, but my experience is that it has not really been seen as a way forward in the past, and everybody has just been saying, 'We have got the cull coming as a result of the report, so everything else goes out the window'. I also have to have some sympathy with this view that some farmers have an air of resignation that, whatever they do, nothing will work other than a cull. It is difficult to talk to them about that problem, particularly if they have had a closed herd for three or more years, and they suddenly get a breakdown. They can look at the wildlife vector, and I would not disagree with them that the wildlife vector may be the cause of their breakdown, but, as the report said, culling that wildlife vector may not solve your problem.

[30] **Alun Davies:** What would?

[31] **Mr Avizienius:** I am not expert enough to know what would do it. I would say that we just need to concentrate more on doing the assessment of each farm and coming up with an action plan.

[32] **Dr Atkinson:** In the example of TB breakdown that you gave, I am guessing that some of the recommendations were that introducing better and more frequent testing would help in that situation. What probably would not help is a cull of all the wildlife on the farm, which may well make things worse.

[33] **Brynle Williams:** I am not wholly satisfied with your answer in this regard. I believe that the agricultural industry is in agreement with you on more regular tests; that goes without saying. However, by your own admission, if you have a closed herd and it is proven that there is no other animal-to-animal transmission and the wildlife vector is the cause, what is the point of removing the whole herd if you do not tackle the source of infection? I am in

agreement with you; I do not want to see the countryside void of wildlife—that is the last thing on earth I want to see. However, we are trying to ascertain how we will tackle this issue.

[34] I mean no disrespect to you—you said yourself that you were not qualified to answer. However, you said that we need to put biosecurity measures in place. We are trying to ascertain, even down to the simplest aspects, what you mean by biosecurity, and consider biosecurity for every other aspect or possible vector as well, as we could bring deer and various other animals into this.

[35] **Mr Avizienius:** Thank you for those points. From one simple man to another, there are 20 or more wildlife species that carry TB, and it is therefore not as simple as just talking about badgers, in my personal view. I restate that if you insist on going down the route of a cull let us not take any half measures. What we mean by a cull is a scorched-earth policy of wildlife, because nothing else will do, according to the evidence contained in the report. I can give you much more detailed biosecurity measures that we have talked about in the Wales TB action group as part of the protocol that we put onto farms. So, let us not beat about the bush. We can keep talking about the cull—

[36] **Brynle Williams:** I am asking about biosecurity.

[37] **Mr Avizienius:** I can give you plenty of suggestions later, but I will not make blanket recommendations, because each farm has to be dealt with on its own merits.

[38] **Alun Davies:** It may prove useful if you were to provide us with written copies of that after this meeting.

[39] **Mr Avizienius:** Definitely.

[40] **Alun Ffred Jones:** There has been some criticism of the randomised badger-culling trials, namely in the evidence sessions at the House of Commons, where comments were made that the science of the report was not sound. I am told that a paper by Professor Simon More has criticised the ISG's analysis of some of the data. Do you believe that the methodology adopted by the ISG was robust?

[41] **Dr Atkinson:** Extremely robust.

[42] **Alun Ffred Jones:** So, you dismiss these comments made?

[43] **Dr Atkinson:** Professor More's paper was published in *The Veterinary Record* as a viewpoint, and it is just that. That paper has not been peer reviewed; it is just a personal view. It is quite a tricky paper to follow, and I do not know whether John Bourne will have read it, but you may be interested in asking him the same question. It simply questions vaguely the ISG's interpretations, and it advances no alternative hypotheses at all.

10.20 a.m.

[44] Views of that kind have always abounded. There are people who do not like what repeated tried and trusted science will tell them, and they can always throw in something equivalent to an anecdote. This is a rather glamorous anecdote, but it does not have the status of the ISG's report, the six or seven papers that have come out of it, or the papers that have supported the findings of the ISG.

[45] **Alun Ffred Jones:** It is frequently remarked that the trial conducted in four areas of Ireland was a success. Do you think that we can learn anything from Ireland?



[46] **Dr Atkinson:** The study in Ireland more or less corroborated the findings of the ISG. The ISG, when it undertook its proactive cull, reduced the incidence of TB within the proactive-cull area. The study in Ireland undertook a reactive cull and a proactive cull, but it did not conduct a no-cull control. That was a flaw in that scientific experiment; you always have to have a control. There was no control, so a proactive cull was being compared with a reactive cull. The reactive cull makes things worse; there was an increase of 27 per cent. So, you are comparing a terrible situation with a situation that is much better. Therefore, it was a false comparison. The situation in Ireland was very different to that in England, because there were far fewer badgers and the area was largely geographically isolated. So, there was less chance of incursion from the surrounding badger territories. Having said that, there was still incursion from surrounding badger territories even with that low density. New strains of TB were found in the badger population after the cull. It all points to a similar phenomenon to that found by the ISG. They are not contradictory results at all.

[47] **Alun Ffred Jones:** Was there a reduction in the incidence of TB in those areas?

[48] **Dr Atkinson:** Yes. TB levels reduced during the Irish trials. Again, that is what the ISG found when it carried out its culling trials. It also found that there was an increase in areas outside.

[49] **Alun Ffred Jones:** You commented earlier that badgers are obviously involved in this disease. So, you accept that?

[50] **Mr Avizienius:** That has never been in doubt.

[51] **Alun Ffred Jones:** When you talk about a holistic approach, does that refer only to animal husbandry and the way in which farmers control their stock? Does it also include wildlife?

[52] **Mr Avizienius:** That part of the report was not written by me, so those are not my words. However, when I talk about a holistic approach, based on my experience since 1999 of discussing this at the TB forum in England, 'holistic' means introducing some of the husbandry measures put forward by the husbandry sub-committee that I was a member of. Every time I go to a discussion about bovine TB, all that we talk about is culling badgers. I would like to comment on the Irish work. Back in February, the Welsh TB action group was due to go to Ireland with the English TB group to discuss with the scientists and politicians the results of their work. Because of the forthcoming election, that was put on hold. Again, I would like to emphasise the need to get this group back up and running if we are to go forward in a coherent manner.

[53] With regard to the Irish work, in some of the areas they chose, TB levels were dropping before they started. We have asked repeatedly for statistics on snaring, the impact upon non-target species, and the number of injuries that occurred through snaring. This information has not been forthcoming. The pro-cull lobby hold this up as the epitome of scientific rigour and state that there are undeniable benefits to culling. However, you should remember that more badgers were culled in one year in the randomised badger culling trial than in the whole of the Irish study. We are in danger of cherry-picking. The reason that we did not oppose the Krebs trial was because we saw it as a bona fide way of finding out once and for all about the ins and outs of the disease. We were criticised for that because of the 11,000 badgers that were killed as part of it. We can only go on what we see in front of us in terms of science. We add a little bit of analysis, and that is what we use to inform our policy.

[54] **Alun Ffred Jones:** Sorry to go on about this, but you referred to the term 'holistic' and, as I understand it, it means including all aspects of a subject. So, do you start from the position that a badger cull or a partial cull, or whatever, is a no-go area?

[55] **Dr Atkinson:** No.

[56] **Alun Ffred Jones:** If you say that badgers are involved in this disease, you would, therefore, include them in some sort of controlled measure, would you?

[57] **Dr Atkinson:** The holistic approach means that you have to consider everything, but you do not go on considering when it is proven to be a disaster and to be making matters worse. That is what happened here—we did consider it. As John said, when the Krebs trial started, we did not know what the badger's role in TB transmission was, so we took that holistic approach. The ISG undertook a wide variety of work of which the RBCT was just one element. That was the holistic approach that we endorsed and that we still endorse. However, results have now come back and they have proven that badger culling would not make things better but, in fact, would make things worse. So, we have taken a holistic approach, but you cannot go on clinging to it when it has been proven not to work. We are not being narrow-minded; we started off being very open-minded and are still open-minded. If there were some brilliant study equivalent in rigour to the ISG study that showed that culling badgers worked, then we would have a complete rethink; we are completely open to that. As John said, we endorsed the Krebs study and we were very unpopular for doing so.

[58] **Alun Ffred Jones:** You referred to the action group set up in Wales and you talked about innovative ideas and so on. So, what actions has that group taken and what effect have they had in any particular area in Wales?

[59] **Mr Avizienius:** As I mentioned earlier, it came up with the innovative ideas because there was very little evidence of, for example, badger populations and badger densities. The last information that we had was in 1995, so we did a road traffic accident, or a 'found dead', survey to get that specific Welsh information, which was important. Furthermore, the setting-up of the intensive treatment areas is an innovative approach. From there, we tried to piece together issues associated with the use of gamma interferon and the wildlife and biosecurity aspect. Unfortunately, the wildlife intensive treatment area has never materialised, because, again, that group has been in abeyance since February 2007. We need to get back and have a look at it, because I think that it offers an awful lot of information that can be used to inform policy.

[60] **Lorraine Barrett:** To endorse something that John just said, I presume that the work that was done by the TB action group will be included or used as part of this review. I would hope that that is the case because, as he said, it did a great deal of good work.

[61] I had a question on culling, particularly following a suggestion from the ISG about culling within geographic boundaries, but I think that you have pretty much covered the culling area, unless you want to say something about the idea that culling within geographic boundaries makes it difficult for badgers to repopulate certain areas. Would you like to expand on that, and I will then go on to the animal welfare issue?

[62] **Dr Atkinson:** Yes, I can expand on it. If you were to find a geographically isolated area—they are pretty rare in mainland Britain—and take out every single badger, the ISG report predicts that you would get a reduction in TB incidence among cattle. If no badgers came back in, it would stay at that low level, but what it does not account for is all the TB that results from cattle-to-cattle transmission, which is the bulk of it. Unless you address that, TB will not disappear. Going back to the old Thornbury trial, which was slightly defined, although badgers could still cross the M4 and various motorways, the incidence decreased significantly, as Mr Bates said, but I do think that that included a study of the cattle, so we do not know how significant the role of cattle-to-cattle transmission was. That is the vital factor. So, even if you clear out everything and badgers are not allowed back in, you still have cattle-

to-cattle transmission to deal with.

[63] **Lorraine Barrett:** Thank you; that takes you back to your holistic approach.

[64] On the animal welfare issue, do you believe that bovine TB in badgers is an animal welfare issue and, if so, should there be a priority for developing a vaccine?

[65] **Mr Avizienius:** Everyone has been clinging to a vaccine for several years now, but every time we speak to the scientists, it is always five or 10 years away and, at the moment, the best chance that we have is the BCG vaccine, but I am no expert in that area. Professor Bourne may want to comment on that.

10.30 a.m.

[66] I have read previous evidence, for example, that of Dr Chris Cheeseman, who insists that it is not a welfare issue in badgers and that a badger infected with TB can happily go on for a couple of years and breed quite well. However, it becomes a welfare issue when that disease is allowed to develop into a clinical disease—not just an infection, but a clinical disease—because it can be quite horrible. Similarly with cattle, we do not regard a reactor as a welfare issue. We get under 10 clinical cases a year of TB in cattle. Compare that with something like cattle lameness on a UK basis and the fact that, at any one time, you probably have around 0.5 million cattle in pain through lameness. In terms of pain that affects the welfare of an animal, there are much more serious ailments than bovine TB. Again, if it is allowed to develop into a clinical disease in an animal, then it will obviously impinge on its welfare. So, that is where we stand on that issue.

[67] **Lorraine Barrett:** You have answered the question that I was going to ask about the welfare of cattle. I have one more question on culling, and you touched on this earlier: do you have any evidence of illegal culling of badgers in Wales?

[68] **Dr Atkinson:** I am not aware of any. Are you aware of any, John?

[69] **Mr Avizienius:** Only anecdotal evidence.

[70] **Alun Davies:** May I take you up on your response to those questions? I find it a somewhat extraordinary statement that when the life of an animal, badger or cow, is foreshortened due to a disease, be that TB or something else, it is not categorised as being an animal welfare issue. I would have thought that the RSPCA, of all organisations, would have considered that to be profoundly associated with animal welfare and almost nothing else.

[71] **Mr Avizienius:** Thank you for that, because that allows me to re-emphasise that if any animal is ill, then it will impinge on its welfare. However, you must remember that a reactor to a skin test may not mean that the animal is ill—it may not develop lesions or have any evidence of lesions and be carrying on quite happily and look normal and live a normal life.

[72] We need to quantify and define what we mean by ‘animal welfare’. From our point of view, welfare is the ability to maintain physical and mental fitness and the capacity to avoid suffering. So if anyone asks me, ‘Why do you not think that that is an animal welfare issue?’, that is how I tend to define it, and animal suffering—

[73] **Alun Davies:** If I could interrupt you—if this animal has a disease or an infection that will develop into a disease, then that animal’s life is foreshortened as a result of that disease and it will face issues that you have described as being animal welfare issues.

[74] **Dr Atkinson:** If it goes on to develop the disease.

[75] **Mr Avizienius:** Yes, if it goes on to develop the disease, the animal's life will be foreshortened. However, is it suffering during that time? Is there any evidence of suffering? That is what you have to consider. We could apply that to many issues relating to cattle. In Wales, among herds of over 300, the worst 25 per cent are managing to hang on to their cattle for 1.98 lactations according to national milk records. That is a foreshortening of a life.

[76] **Alun Davies:** I take from that that you would be happy for us to adopt a policy of bovine TB control rather than eradication?

[77] **Mr Avizienius:** I would love to see it being eradicated, but, as yet, I am not aware that we can achieve that unless we find an effective vaccine.

[78] **Mick Bates:** I would like to pursue the comments made on the welfare issue. You made some comparisons between the welfare of badgers and cattle. As an organisation, do you undertake the killing of animals on welfare grounds?

[79] **Mr Avizienius:** Yes.

[80] **Mick Bates:** So how many animals would you normally kill on welfare grounds?

[81] **Dr Atkinson:** I forget the number, but I think that we euthanise around 7,000 every year. I guess that it would be much more than that in terms of animal suffering if our animal centres are dealing with suffering animals—it is thousands anyway. We have no problem with euthanising suffering animals.

[82] **Mr Avizienius:** It is about the humaneness of that death if you have to foreshorten an animal's life. While the animal is alive, the emphasis is on the quality of the animal's life. If the animal's life quality is good, even if it may be infected with a disease that might develop into clinical welfare-threatening disease, I cannot see any problem with the welfare side of it; if its quality of life is good, its welfare is likely to be good.

[83] **Mick Bates:** The figures on the number of animals euthanised are rather hazy. Is it possible to provide us with some figures? You must have records.

[84] **Mr Avizienius:** They are published every year in our annual report.

[85] **Mick Bates:** You did quote a figure of 7,000 animals.

[86] **Dr Atkinson:** I forget where that number comes from. That might have been the number of healthy animals euthanised in animal homes. I can get you the number. The figures are publicly available and they are something of which we are not ashamed—quite the opposite, because it is done for a welfare purpose. The RSPCA kills lots of animals because it has to—it is our duty to the animals. We will give you the figures.

[87] **Brynle Williams:** I find it interesting that you find it acceptable to leave cattle that test positive for TB in the herd. You talk on the one hand of welfare, but as TB is a debilitating or wasting disease, there is surely not a great deal of quality of life for the animals in leaving them to waste away on farms and to continue passing the disease on and on.

[88] **Mr Avizienius:** I think that you have possibly misunderstood me. I did not for one minute say that it was not a welfare issue should it develop into a clinical disease. A reactor does not necessarily mean that it is physically ill.

- [89] **Brynle Williams:** Not at the beginning, but it will become ill eventually.
- [90] **Mr Avizienius:** If that animal reacts, then it is isolated and should be taken out of the herd.
- [91] **Brynle Williams:** That is precisely what we have been getting at—
- [92] **Mr Avizienius:** That is what happens.
- [93] **Brynle Williams:** We are looking at this issue holistically and we keep coming back to this. I am not pro killing badgers—I do not want to kill them for the sake of it. TB is a debilitating disease and we are trying to attack it to ensure that we can eradicate it. I was in Ireland with the previous committee two years ago, and they found that the first 20 per cent of badgers that they trapped there had a chronic state of TB. There were lesions on the badgers and they were weeping. Those were badgers out foraging during the day.
- [94] **Mr Avizienius:** Given my previous definition, that is a welfare problem, but I cannot comment on badgers that you saw whenever it was. I am just trying to say that, with less than 10 clinical cases of TB per annum in the UK, to us that is not a welfare problem compared with mastitis, lameness, bovine virus diarrhoea, Johne's disease or calf mortality. That is what I am trying to put into perspective. We agree completely that, if an animal is clinically ill, its welfare will be affected. However, that is not the case if the animal is not ill, despite the fact that it may have an infection. I may have an infection today but I feel fine; further down the line my welfare will be compromised if I get clinical symptoms. That is the simple point that I am trying to emphasise.
- [95] **Lorraine Barrett:** My question will probably have a 'yes' or 'no' answer. Regarding the culling of badgers, is there any way or means of culling only badgers that are suffering with TB, thus not killing any healthy badgers?
- [96] **Dr Atkinson:** Unfortunately not.
- [97] **Mr Avizienius:** That is one of the myths that has been reported in the past—that we only need to kill the sick badgers. That is not possible at the present time, because there is no live test.
- [98] **Brynle Williams:** What are your views on the ISG's main conclusions, that improvements to cattle-testing regimes could limit the spread of the disease?

10.40 a.m.

- [99] **Mr Avizienius:** Again, I would refer to Ireland. Ireland tends to have an annual testing regime where all animals are tested, and if it was down to me, that would be one of the things that I would introduce first. I would have annual testing of everything, because I think that 84 per cent of reactors are found in annual-testing herds. So, that would be one thing that I would do. I would also probably have the gamma interferon as a standard, with the skin test. Those would be two things that I would want to introduce.
- [100] **Brynle Williams:** Do you think that developing this side alone would be the holistic approach?
- [101] **Mr Avizienius:** I think that increased sensitivity of the diagnostics, and biosecurity and husbandry measures are some of the areas that you could possibly consider. The husbandry report that we had before has actually died a death; no demonstration farm has ever been implemented to illustrate these things to farmers. It has always been a case of starting

with a cull and adding other things as an afterthought. Those are the kind of things that I would want to introduce, just to see if they work.

[102] There are two questions that we have always asked. Are the husbandry measures that are recommended in these various reports, such as the Phillips report, any good? If they are, are they being implemented? To date, we have not had any answers. So I, as a stockman, would want to know whether they were any good, because if there is no way of husbandry making a difference overall, then major issues will have to be considered. As I have said before, when we talk about a cull we are not just talking about a few; we are talking about near-extirmination across vast areas. I doubt whether other users of the countryside would accept that, and I doubt whether it is legally possible. So, we need to be careful, and when anybody suggests a cull to me, I return the question: 'How do you propose to have this cull?'. It is not just on a few farms in Pembrokeshire and Carmarthenshire. You are talking about wiping those counties out, I would say, given the evidence from the ISG report.

[103] **Brynle Williams:** Effectively, you are saying that we should put a lot more research into other disease and welfare problems that could be triggering—

[104] **Mr Avizienius:** It is an interesting point that you make, because with the endemic nature of things like bovine viral diarrhoea and Johne's disease, I am positive that there is a detrimental effect on the immune system of the animals. Previously, people have said—and this is not my viewpoint—that there is a comparison with human TB in previous years. Humans were much more likely to get TB in overcrowded conditions with poor nutrition, and some people have likened that to the present state of cattle TB, which I do not necessarily subscribe to. According to a Liverpool veterinary surgeon, writing in the veterinary journal *In Practice* a few years ago, some of the housing systems that we are expecting cattle to live in are basically slums. That is his view, not mine. So, again, some people have likened it to the conditions for contracting human TB, and cattle are living in those conditions at the moment. However, I am not a subscriber to that view.

[105] **Alun Ffred Jones:** May I just come in on that? New herd incidence of TB has increased threefold since 1998—in Wales, presumably, as the figures are for Wales. Are you saying that standards have fallen on our farms? Is that the reason, do you think, for the increase?

[106] **Mr Avizienius:** Not necessarily, no—I am saying that there is evidence that a lot of farms have got housing systems that were built in the 1980s. In dairy cattle breeding—and I have worked for a breeding company—the holstein cow has overtaken a lot of those housing systems, so that we will have cows six feet long expected to live in cubicles that are five and a half feet long. That is not a particularly good thing. Cow comfort must be absolutely paramount during the winter housing period. If they are uncomfortable, it has detrimental effects on their welfare over time.

[107] **Alun Ffred Jones:** What I am asking is whether you think that that is what accounts for this increase.

[108] **Mr Avizienius:** I am not saying that at all. The January to June 2007 reactor figures in Wales are very surprising to me, given that the previous figure was 1,400 or 1,300. To go up to 4,079 in those six months is worrying to me and I have no answer as to why that may be. Even so, after the gamma interferon trial, a whole host of herds were seen to be persistently infected, with reactors three years after the trial. So, I have no answer as to whether that persistent infection is with the cattle or there is still incursion by an infected badger. However, I am really worried that we have 4,000 reactors and I am in no position to answer as to why. This is again where I would see the Welsh TB action group—because of those who are on it: vets, farmers and wildlife interest groups—being able to get some kind of

idea as to what is going on. It is a worry to me; I would agree that that is the case.

[109] **Brynle Williams:** It is interesting that you brought up the scenario of bad housing, but, to be fair, we are also seeing a dramatic population explosion among badgers. On my farm—I openly admit that I am a farmer—thankfully, I have a healthy population of badgers, but on my land I have four setts where, 25 years ago, I would be considered lucky to have one. Is it overcrowding or a lack of foraging areas? I would like to know.

[110] **Dr Atkinson:** Animals manage their numbers well. One thing that has never been properly elucidated is the relative role of badger-to-cattle and cattle-to-cattle transmission. The ISG has concluded from its experiments that the majority of transmission is cattle to cattle, but I do not have the data to give a precise answer as to whether the population of badgers has increased over the last three or four years. If there is such an increase, it is impossible to give an answer as to what relation that has to the increase of TB in cattle, because it is a multifactor system.

[111] **Alun Davies:** Nid oes gennym amser am fwy o gwestiynau yn y sesiwn hon, felly cymeraf y cyfle hwn i ddiolch ichi am eich amser ac am ddod yma heddiw i ateb ein cwestiynau a chymryd rhan yn yr ymchwiliad. Byddwn yn darparu cofnod ysgrifenedig i chi o'ch sesiwn dystiolaeth a byddem yn hoffi derbyn y dystiolaeth ysgrifenedig yr ydych wedi cytuno ei darparu. Mae'r pwyllgor yn gobeithio gorffen yr ymchwiliad hwn yn ystod y ddau fis nesaf, a byddem yn hapus i drafod ymhellach â chi yn ystod y cyfnod hwnnw. Felly, diolch yn fawr am eich amser.

**Alun Davies:** We have no time for further questions in this session, so I will take the opportunity to thank you for your time and for coming here today to answer our questions and take part in the inquiry. We will provide you with a written record of this evidence session and we would like to receive the written evidence that you have agreed to provide. The committee hopes to conclude its inquiry during the next two months, and we would be happy to discuss further with you during that period. So, thank you very much for your time.

10.50 a.m.

[112] Croesawaf y tystion nesaf. Diolch am gymryd yr amser i ymuno â ni y bore yma. Yr ydym oll wedi cael y cyfle i ddarllen eich tystiolaeth ysgrifenedig a gwerthfawrogaf yn fawr iawn yr amser yr ydych wedi'i gymryd i gyflwyno'r dystiolaeth honno. A wnewch chi gyflwyno'ch hunain a gwneud rhai sylwadau agoriadol?

I welcome the next witnesses. Thank you for taking the time to join us this morning. We have all had the opportunity to read your written evidence and I very much appreciate the time that you have taken in presenting that evidence. Will you introduce yourselves and make some opening remarks?

[113] **Mr Lawson:** Thank you, Chairman. My name is Trevor Lawson and I am public affairs adviser to the Badger Trust. I am a journalist and publisher by trade. My background is in environmental science, in which I have a first-class honours degree.

[114] **Mr Clark:** I am Steve Clark, chair of the Gwent Badger Group, which is a role that I have been involved in for almost 20 years. I have come along this morning to speak to you on behalf of Badger Trust Cymru, and I thank you, Chairman, for allowing us to attend. We welcome this opportunity to present our policy on bovine TB. I would like to let you know that badger groups in Wales are very pro-farmer, so we focus on positive solutions that will benefit farmers and taxpayers in a sustainable way.

[115] The challenge for the Welsh Assembly Government is to decide on how best to fund these solutions, with contributions from the farming industry and taxpayers. We submitted a

detailed and referenced report for the position as we see it. Briefly, we accept the full findings of the ISG in that badger culling will make no meaningful contribution to the control of bovine TB. We have made four recommendations for enhancing TB control, which I can outline to you. Most importantly, decisions require the guidance of fully independent scientific advice, which is distinct from veterinary advice. That is all I have to say.

[116] **Alun Ffred Jones:** Gan eich bod yn dweud eich bod yn derbyn canlyniadau adroddiad yr ISG, sut y byddech yn ymateb i'r feirniadaeth sydd wedi bod, neu'r sylwadau a wnaed, gan yr Athro Simon More a chydweithwyr iddo yn *The Veterinary Record*, i fethodoleg yr adroddiad? **Alun Ffred Jones:** You say that you accept the conclusions of the ISG report, but how do you respond to the criticism or comments made by Professor Simon More and his colleagues in *The Veterinary Record*, on the methodology of the report?

[117] **Mr Clark:** I do not think that anyone could question the methodology of the ISG report. It is the most robust science that we have ever had, and we have waited a long time for it. I have not paid a great deal of attention, to be honest, to the criticism. Everything that the ISG carried out was peer-reviewed and since this question of the role of badgers was raised, nothing has been done that compares to this. So, I feel that it is the strongest evidence that we have. It is always likely to be criticised, even by other scientists, but you have to go with the ISG report.

[118] **Mr Lawson:** On that note, I have read in detail the submission by Professor More to *The Veterinary Record*, and I will make two comments on it. The first comment, which is a particularly ironic one, is that at the outset he sets out the basis of creating scientific evidence, pointing out that you should control for everything except the variable that you are looking at. The irony there is that the Irish study did not have a control, so by Professor More's own admission, the Irish four-area study was not sound science, in stark contrast to that from the ISG. The second side to the submission from Professor More that we find slightly curious is that the research has been published by the ISG in the *Proceedings of the National Academy of Sciences* and *Nature*, the key issue about which is that they are multidisciplinary—they are not just veterinary journals. They have contacts across the field of science, particularly in the areas of epidemiology and statistics, which many of the veterinary journals might not have. Normal scientific protocol in a situation like that would have been for those criticising the ISG's work to respond formally through either of those two journals. I find it slightly odd that, instead, we have an opinion piece in *The Veterinary Record* and not a formal scientific response in *Nature* or *PNAS*. It may be that responses were submitted but were rejected by the journals—we could ask the Irish researchers, if they would be prepared to tell us—or perhaps they did not feel that they had a strong enough case to put to those journals. I certainly find it rather unusual.

[119] **Alun Ffred Jones:** Iawn. Hoffwn symud ymlaen. Yr ydych yn dweud yn eich cyflwyniad bod adroddiad yr ISG yn cynnig, **Alun Ffred Jones:** Okay. I wish to move forward. In your presentation you state that the ISG's report constitutes,

'A sound scientific and holistic review of the evidence for the causes and spread of bovine TB.'

[120] Yr ydym wedi sôn am y gair 'holistig' eisoes. A wnewch amlinellu sut yr ydych wedi dod i'r canlyniad bod adroddiad yr ISG yn cyflwyno golwg holistaidd ar y broblem hon? We have mentioned the word 'holistic' already. Can you outline how you have come to the conclusion that the ISG's report offers a holistic view of this problem?



[121] **Mr Clark:** Excuse me, but I did not catch the first part of your question.

[122] **Alun Ffred Jones:** Cwestiwn yw am y gair ‘holistaidd’. Yr ydych yn dweud bod adroddiad yr ISG yn cynnig ymateb holistaidd. Holais am hyn ynghynt. Sut ydych wedi dod i’r canlyniad bod yr argymhellion yn cynnig ateb holistaidd?

**Alun Ffred Jones:** It is a question about the word ‘holistic’. You say that the ISG’s report offers a holistic response. I asked about this earlier. How have you come to the conclusion that the recommendations offer a holistic solution?

[123] **Mr Lawson:** The response to that is pretty straightforward. It has been clear that badgers are involved, so there is not a problem with that. In looking at something holistically, if you build a basic disease model, you have animals that are infected, animals that are susceptible and the animals that get removed, when you build that model. One of the variables that you build into that model is the rate of transmission between the infected animals and the susceptible animals. The other variable is the rate at which those infected animals are then removed. The ISG has looked at this holistically; it has looked at what are the best ways of dealing with that, so it has shown that by controlling the disease in cattle—and there is very strong modelling on this—and by removing the infected cattle, you reduce the risk to susceptible animals of re-infection.

[124] On the issue of badgers, the ISG has shown that you increase the number of susceptible animals by culling, because you encourage the spread of animals around. That means that you also increase the rate of contact between badgers and cattle. It is an issue that is largely about contact. In terms of the basic model, how do you reduce the amount of contact between infected animals and susceptible animals? The ISG shows that culling badgers increases that rate of contact and makes the disease worse. How do you answer that holistically? If killing badgers does not work, the approach is to ask what else we can do. One of the curious things that we find about this whole debate—and, frankly, I find it bizarre—is that no-one has asked how else we stop that contact. The ISG’s work shows quite clearly that the pathology of the disease in both cattle and badgers suggests close contact between those animals. That does not happen in the field. Long-term studies of badgers show that badgers in the field stay at least 4m away from cattle—they do not go up to cattle as they are not interested in them and they avoid them, so there is not that opportunity for close contact. However, there is contact in farm buildings. So, if you want to deal with the badger part of this question holistically, you can address it by stopping badgers from getting into troughs, feed stores and farm buildings. It would be a lot cheaper, a lot more cost-effective and a lot more popular with taxpayers. That is how it is addressed holistically.

[125] **Alun Ffred Jones:** Can you explain how, by culling badgers, you increase the number of contacts? How does that work?

[126] **Mr Clark:** When you remove a pocket of badgers, those that remain, because you never eliminate them all, will start to move out from those areas and into new areas. That then breaks down the social group structure of the badgers and you get a lot more badger movement, which will then increase the likelihood of contact between badgers and cattle.

11.00 a.m.

[127] **Mr Lawson:** In addition, if you remove badgers by culling, you create a vacuum, which sucks in other badgers from outside the area. So badgers from outside the area—and it is critical to understand that badgers are getting TB from cattle in the first place—can then come in, acquire the disease, and take it further afield because the size of their range has expanded. One thing that the badger found dead survey showed was the correlation between badgers close to infected farms and infection. It has been suggested that that shows that cattle are getting TB from badgers. We think that it actually shows the exact opposite, that the

further you get away from infected cattle, the less likely you are to find infected badgers because they are not getting the disease from infected cattle. If you look at this perturbation effect, if you cull the badgers around those infected farms, the unaffected badgers from outside will come in, catch it from cattle, and spread it further afield.

[128] **Alun Ffred Jones:** If what you say is true, what accounts for the huge increase in the incidence of TB in herds over the past eight or nine years? Are you saying that, somehow or other, there has been a change in the way that farmers have been looking after their cattle? What has that change been? Obviously you think that they have been doing something wrong.

[129] **Mr Lawson:** If you look at the statistical map, and at how the disease has changed, there was already an upward trend. In this country, we move more cattle over longer distances than anywhere else in Europe and we have larger herd sizes and those herds are growing because of external market forces. Larger herds make better economic sense for farmers, so you have that going on. If you have a larger herd and you have a skin test that is missing infection in a larger herd, it is harder to get rid of. Do not forget that, in those days, we had no pre-movement testing, so you were also moving the disease further afield through animal movements. Those are the changes.

[130] The biggest issue, over the last few years—it was a catastrophic error and the farming unions, frankly, and a weak Government at Westminster were to blame for it—was allowing the movement of untested cattle in the wake of foot and mouth disease. That came about as a result of pressure from the farming unions, which wanted that, and said that that was what had to happen, despite the evidence from the ISG to the Government, which stressed that that would make the situation far worse—and it has. We have had an absolute catastrophe as a result of that, and that is the fault of that decision. It was a terrible decision. Other scientists from around the world that we talk to, in countries such as New Zealand, think that we were absolutely nuts to do that. It was a ridiculous thing to do and it has had a terrible effect on many farmers—it was a serious error.

[131] **Alun Davies:** Alun, a ydych yn **Alun Davies:** Alun, are you happy with that? hapus gyda hynny?

[132] **Alun Ffred Jones:** Ydw. **Alun Ffred Jones:** Yes.

[133] **Lorraine Barrett:** May I come back in to expand on the issue? If you cull badgers in a certain area, you said that other badgers would then move in, Steve. Why would they do that? Is it because there is more room for them? Could you just explain that to people who may not understand the psyche of badgers?

[134] **Mr Clark:** Badgers are very territorial animals. They have a particular territory that they roam in and they will defend it against other badgers. Once you take those animals out, if that land will sustain badgers, other badgers will move in. They will take over the territory and extend their own territory into that vacant area. The problem that arises then is that it is difficult to remove all of the badgers from the target area, so you get a lot more movement, both in and out and around the area—there is greater disruption to the badger population by any attempt to cull them.

[135] **Lorraine Barrett:** I think that that is an important point.

[136] **Mr Lawson:** May I add one other scientific fact, which relates to badger ecology? It is also the case that as populations decline in density the remaining animals respond, in just about every species that we know of, by breeding at a higher rate. One of the consequences of taking out animals is that they have larger litters, so the replication of the animals increases in order to fill that opportune habitat.

[137] **Mick Bates:** I would like to refer to some issues that you raised about the economics of the trial and, in particular, the cost-benefit analysis of it. Emphasis is placed in the report on the economic costs of culling badgers in the ways adopted by the randomised badger culling trial. Do you believe that this is a fair assessment of the perceived costs and benefits of the trial?

[138] **Mr Lawson:** Can you explain what you are getting at there?

[139] **Mick Bates:** Emphasis was placed on the cost-benefit analysis—you mentioned it many times in your report. Do you think that policy decisions should be based on an analysis where cost is the main policy driver?

[140] **Mr Clark:** Do you have an open purse to deal with this? There are so many issues that could contribute to the control of bovine TB. You must consider the cost of carrying out huge-scale removal and badger culling, compared to the benefits that it will bring you. That money could be directed towards the improvement of testing and supporting farmers. Those are the measures. Some 70 per cent of the TB problem is within cattle, so should not that huge amount of finance be directed towards controlling that, rather than making a huge expenditure on starting to control what is, at most, around 30 per cent?

[141] **Mr Lawson:** Perhaps I misunderstand your question, but it makes sense to me that a cost-benefit analysis should compare costs and benefits. Are you wondering whether it should look at something else? I am not quite sure what you are getting at.

[142] **Mick Bates:** I am always concerned about animal welfare. I would look at ensuring animal welfare was right first. However, it seems that your emphasis is simply on cost-benefit analyses. Are you telling me that if it costs too much money to remove the badgers we should not do it?

[143] **Mr Lawson:** Is this a question about dealing with the welfare of badgers and the relative costs?

[144] **Mick Bates:** Yes, and of cattle of course.

[145] **Mr Lawson:** Let me deal with that, because it is a huge red herring and a source of enormous frustration. Badgers get TB; a small minority of them in TB hot spots go on to suffer from the clinical effects of the disease, but the numbers are miniscule. Long-term studies in places such as Woodchester Park show that TB is not a significant cause of death in badgers. Therefore, it is not a welfare issue. This is one of the curious things for those of us working for badger groups. We deal with badgers daily and we find that, primarily, badgers are brought in because they have been hit by cars, so we are dealing with road traffic accidents. That is the primary cause of badger mortality and serious injury that we have to deal with. I am not aware of any badgers that have come to us and had to be euthanised because they were suffering from bovine TB. That is how rare the situation is.

[146] Let us extrapolate to the logical conclusion. Are you saying that 98 per cent of badgers, which are perfectly healthy, should be killed in order to protect the welfare of the 2 per cent that might at some point go on to suffer the clinical effects of the disease? Ethically, that is a nonsensical argument. On the issue of cost, if you are really serious about this and you really are concerned about badger welfare, which we would very much welcome, you could put that money to far better effect by putting more tunnels and fences along roadsides to protect badgers from road deaths.

[147] **Alun Davies:** Can I confirm a figure that you gave there? You said that 2 per cent of

the badger population has the infection. I assume that that is an overall figure, because in some areas the percentage is much higher.

[148] **Mr Lawson:** For clarity, the data, which are consistent in the UK and Ireland, for TB hot spots show that you can identify the infection in around 12 per cent of the badger population through culture or clinical symptoms. However, I was talking about the percentage of animals in hot spots that may go on to develop clinical signs of the disease.

[149] **Alun Davies:** Thank you for that clarification.

[150] **Mick Bates:** I wish to pick up on your comments that the Government does not look at the cost of protecting buildings. Are you saying that the ISG has not given enough consideration to the cost of protecting buildings? Do I understand you correctly on that?

[151] **Mr Lawson:** I was referring to the cost of separating badgers from cattle in the areas most likely to be affected. In fairness to the ISG, that was not its remit. We are not criticising the ISG per se for that. However, if you track back on this situation by seven or eight years, select committees at Westminster were asking the Government what plan B was, if it found that culling badgers was not the best way to deal with the problem. Politicians have been asking this question of the civil servants behind this for a decade, and they have not come up with any answers. The only available research at the moment is a study being run by the Central Science Laboratory, through Woodchester Park, which is looking at the costs, relative to the costs of a breakdown, of protecting a farm, keeping badgers out of farm buildings, and minimising the risk of contact between those animals.

11.10 a.m.

[152] It is a start, but we do not think that that piece of research is good enough, because it will not actually tell farmers what its cost benefits are. One of the problems for Brynle, for example, as a farmer, is that if I came along and told him, 'Brynle, if you spend £100,000 keeping badgers off your farm, you will save £10,000 from the risk of the next TB outbreak'—that is a waste of time. If, on the other hand, I were to say, 'If you spend £10,000, you will save yourself £100,000', then that clearly makes sense. That is the problem: we have no reliable scientific and economic information, because everybody in the veterinary service of Government is pinning his hopes on a badger cull. As the RSPCA said earlier, it is an easy solution. I think that farmers have been poorly let down by that; it is a great shame. There is now an opportunity to pursue that a lot harder and get some more robust evidence.

[153] As I understand it, the Assembly has a fair degree of freedom regarding where it spends money, and so can divert resources from agricultural budgets to farmers. You could achieve a whole load of farm animal welfare objectives by helping farmers, such as tenant farmers who are capital-poor, to improve the standards of their farms for animal welfare purposes, taking bovine TB into account at the same time, thereby killing several birds with one financial stone.

[154] **Brynle Williams:** There is one thing that I am particularly concerned about. I take your point about farm biosecurity, but what about the crops that we are bringing in? If badgers are excreting the disease through their urine—and I know that they have latrines, and so on—on the fields, how can we keep them off those fields? This is not only a matter of grass for grazing through the summer, but also of conservation. I have asked a couple of vets, but I must admit that it has not been substantiated how long TB will live 'in store', for want of a better word, in silage or in hay. If we do have infected wildlife, I would like to move on to looking other ways of dealing with this issue other than just simply talking of killing wildlife, which is why I am asking the question. How do we reach a conclusion in which cattle and wildlife are kept apart? This is, effectively, what you want to do indoors and we

need to do it outdoors as well.

[155] **Mr Lawson:** If you consider that to be a financial risk—that is, bringing in hay to feed your cattle over the winter, in that the risk of their contracting bovine TB is increased by the presence of badger urine on the hay from before it is brought in—you could put an electric fence around the field to keep the badgers out. That would be a relatively low-cost solution to the problem, but, again, the difficulty is that we just do not know the answer to these questions, and the pathology of the disease suggests close contact between animals through aerosol transmission as the cause rather than the transmission route just described. However, it is a problem if we do not know the answer. Sorry, Steve, did you want to say something?

[156] **Mr Clark:** One of the recommendations made to farmers in the Department for Environment, Food and Rural Affairs document was to avoid taking crops from field edges, which are the most likely areas to find badger latrines. When any urine or similar is deposited on open pasture, it does not last very long—it is when it is tucked under hedgerows and so on that it lasts. Where maximum hay-cutting is done within the field, the advice is to avoid the field perimeters, where the likelihood of drawing in anything from the latrines into the field is greater. That advice has been sent out for several years now.

[157] **Brynle Williams:** During September and October, in areas where there is a high density of badgers, you can see where they have been digging under a lot of cowpats out in the grazing field, going after worms and grubs. It is one devil of a job.

[158] Moving on a bit, do you have any reservations or concerns about the proposed improvements to testing regimes?

[159] **Mr Clark:** Do you mean testing regimes for cattle?

[160] **Brynle Williams:** Yes, and badgers.

[161] **Mr Clark:** You will find it extremely difficult to test badgers, because the only way of confirming whether badgers have TB is through a post-mortem examination. So, it is impossible to say that we will test badgers and remove only the infected animals.

[162] **Brynle Williams:** Let us go down the cattle route.

[163] **Mr Clark:** The cattle testing regime to date has relied on a test that is not as accurate as it could be. We certainly need something stronger than that, which you get through the gamma-interferon test and through an increase in the frequency of testing. That is bound to pull out infected animals far quicker. It is true that there will be a problem in that the gamma-interferon test will draw out a lot of animals far earlier in the testing programme and the cost will fall on the Assembly. However, that testing, which is far more reliable than the current skin test, when done more frequently, will reduce the incidence of TB in cattle caused by cattle-to-cattle transmission and the movement of cows. That is the way forward.

[164] **Brynle Williams:** You will get no arguments from the farming community about more regular testing. However, with regard to the ISG recommendations, who will foot the bill for this additional testing, time after time?

[165] **Mr Clark:** It has to come back to the farming industry. In relation to animal disease, we are seeing taxpayers' money going back to private enterprises. Taxpayers have supported this for a number of years, but the ISG has identified it as a farming problem. So, farmers must now start to step in and take control of this problem, and not only in controlling it, but also doing so in financial terms.

[166] **Brynle Williams:** With the costs faced by the farming community at the moment, it could not take on additional costs like this. This comes back to the question asked by my colleague, Alun Ffred: are we looking at it holistically? You and the previous witnesses stated that we are trying to take a holistic approach. This is an important issue. We have to look at all stages. We cannot be cleaning out one herd after another and restocking with clean, pre-tested herds only for them to go down four or five years later, and for farms to have to live under restrictions for six or seven years, in some cases. This is where we hope to bring everyone on board to tackle this in a way that we deem to be holistic.

[167] **Mr Lawson:** With respect, Brynle, this is an argument for you, as politicians. If you think that your electorate will accept your throwing, say, £100 million at farmers to help them through the short-term crisis—if the electorate will buy that—then do it. If not, given what the science shows us and what we know to be the best solutions, there needs to be an acceptance that this disease will remain more persistent for much longer. One of the difficulties and real problems with the nature of politics is that the relatively short-term nature of politics, and short-term decision making, makes it difficult to make a decision about how much to spend in the short term. If you could say that spending £100 million per year for the next three years would mean that we were on top of this problem and had reduced incidence by 70 per cent, and if those three years fell within the current time frame of the Assembly, it would be easy to swing the funding in that direction. However, if it will take longer than that, it takes you into future Governments and it will become more of a problem. So, there is an issue there about how it is addressed politically.

[168] In Northern Ireland, they came down heavily on cattle movements and dramatically increased levels of gamma-interferon testing, the disease rate was reduced by 40 per cent in a year. That was a phenomenal rate of change. Admittedly, they started off from a higher level and, as one of the officials pointed out, it is easier to achieve a reduction when you start from a high point than it is when you are at a relatively low level.

11.20 a.m.

[169] However, it does indicate that there could be very rapid changes. The ISG, in its modelling, has suggested that it could be very rapid indeed. If you have time, I would just like to come back to the issue of Ireland in relation to a question that was asked earlier of the RSPCA. Would it be okay to do that?

[170] **Alun Davies:** Yes. Brynle, are you content with the answers that you have received?

[171] **Brynle Williams:** No, not particularly, to be quite honest. I think that the answer that the Badger Trust has given is that we are only looking at control, not eradication. I think that we need to be looking solely at eradication. I do not think that, at the moment, you are prepared to accept that we need to eradicate this disease.

[172] **Mr Clark:** Your first step must be to control. Your long-term aim should be eradication, but I would question whether that—

[173] **Brynle Williams:** We have been trying for many years.

[174] **Mr Clark:** I think that control is within your grasp; eradication is a very long-term policy. At the moment, eradication needs to be set aside. We need to control what is happening currently and I think that the measures that have been presented are those that will control the disease, prevent the increase and start the downward trend. If that downward trend continues on to eradication, everybody would be happy. However, at the moment, we have to focus on the control and the prevention of further increases.

[175] **Lorraine Barrett:** I will just use my one question to ask Trevor what he wanted to tell us about the Irish four areas trial. I then have to go on a school visit, so I hope that you will excuse me. I have appreciated your answers, even though a lot of the questions have come from one particular Member. I was grateful for that, because you have given us a lot of useful information. On Ireland and the four areas trial, do you think that there are lessons that we could learn from that?

[176] **Mr Lawson:** Sure. Compared with the randomised badger-culling trial that took place in England, we think that the Irish results are nowhere near robust enough. One of the problems that we have with the Irish data is the sheer lack of data. I pointed out earlier that Ireland has not effectively controlled all the variables. We have a graph in the back of our report, to which I just draw your attention. From 1999 to 2004, there was a dramatic drop in the number of TB reactors in cattle. That was largely during the period of the four areas study in Ireland. So, we know that, across Ireland as a whole, TB was dropping massively. These data, incidentally, were taken from a separate paper by Professor Simon More. The reason for that drop was that, during that period, they introduced gamma-interferon testing and anamnestic enzyme linked immuno-sorbent assays, or ELISA, testing, which is designed to detect cattle that have become immune to the standard skin test, so it is looking for animals that could not otherwise be found. They also started to monitor their cattle in a more effective way, so they knew roughly how many they had and where they were, although there were still big gaps in that information. All that was taking place during the four areas study; however, if you read the paper, you will see that we have no idea what effect that had in the four areas study zones, because they had no scientific control, which is a fundamental precept of scientific research.

[177] **Alun Davies:** Is it therefore your contention that the Irish experience, which has clearly seen a decline in TB numbers, is due to cattle control and a testing regime rather than any culling of badgers?

[178] **Mr Lawson:** The proportion of cattle in Ireland infected with TB is still twice the proportion of the cattle infected in the national herd in Great Britain. You cannot go to anywhere in Ireland and find areas where there is no TB. There has been no TB eradication anywhere in Ireland. It is still a massive problem over there.

[179] **Mr Clark:** When discussing the problem, people continue to look at the four areas trial in the Republic of Ireland, but if you look at how TB is being tackled in Northern Ireland, you will see that they have effectively taken on board the measures presented by the ISG and reduced the incidence of TB in cattle, and that without culling one badger.

[180] **Alun Davies:** Thank you very much. If there are no further questions, I will bring this session to an end. I thank you for the time that you have taken in preparing your written evidence and for the time that you have taken this morning to come here and answer our questions. We appreciate that and thank you for it. You will be provided with a written transcript of this morning's session for your information. We hope, as a committee, to come to our conclusions and issue a report in early November. With your consent, if we have any further questions during this process, we would like to come back to you and seek further written information, if that is necessary. We thank you again for your time this morning and we look forward to working with you to find a solution to this issue.

[181] **Mr Lawson:** We hope so. Thank you for taking the time to listen to us; we appreciate it.

[182] **Mr Clark:** Thank you.

[183] **Alun Davies:** We will take a break now for 10 minutes.

*Gohiriwyd y cyfarfod rhwng 11.25 a.m. ac 11.45 a.m.  
The meeting adjourned between 11.25 a.m. and 11.45 a.m.*

**Ymchwiliad i TB yng Nghymru: Grŵp Gwyddonol Annibynnol  
Inquiry into TB in Wales: Independent Scientific Group**

[184] **Alun Davies:** I welcome Professor John Bourne to the meeting this morning and thank him for taking time to join us and to discuss with us the report that the ISG published in June. I will start this session by asking you to say a few words on that report and on your conclusions and recommendations.

[185] **Professor Bourne:** It is important to emphasise from the outset how the ISG worked and the scientific rigour that we introduced into the work that we have done. As you know, we work to strict standard operating procedures. We spent a lot of time designing the trial, not only to provide answers to the cardinal question, namely ‘Can culling badgers contribute to the control of cattle TB?’, but to put in place a trial that provided a whole range of epidemiological evidence relating to the ecology and TB in badgers, and a collateral programme to provide us with epidemiological evidence of the disease in cattle. I have heard reference this morning to taking a holistic approach, and you will see from reading our very early reports that we were determined that we would adopt a holistic approach, and this was accepted by the then Minister, Jeff Rooker, who is now Lord Rooker, and that is the way in which we moved forward.

[186] We recognised from the outset that we were dealing with an emotive subject. The whole issue was surrounded in dogma, anecdotes, personal views and groups that were poles apart in terms of their understanding of what science there was—I am bound to say that there was not a hell of a lot—and of where control measures should be directed. From the outset, we insisted that all our work would be audited independently by auditors put in place by DEFRA. That was on our request; we insisted on it. You will notice also that we published our work as we proceeded with the trial; we did not, as some have done in the past, accumulate all the data and publish at the end of the period of work.

[187] We also opted to go for the highest-quality scientific journals, which will not have escaped your notice, namely *Nature*, *PNAS*, the *Journal of Ecology* and the *Journal of Zoology*, with international scientific referees, and not just UK referees—we went for a UK and an international refereeing audience. We felt that it was paramount that our science should be underpinned by that. It would be perhaps valuable for you to read some of the auditors’ reports of the work that we have done. For example, the auditor of the statistical analyses read from evidence given by the National Farmers’ Union or the Farmers Union of Wales, and they were critical of the analyses that we did. I can simply say that these were audited and that the auditor complimented the group on its thorough analyses and suggested to Ministers and to DEFRA that our approach should be an exemplar for future scientific approaches adopted by the Government.

[188] I also heard this morning that criticism has been levelled at the quality of the science by the select committee in London. I suggest that you read the remarks of the chairman of that committee, who commended us on the scholarship of the work that we put into providing the final report. So, if you wish to discuss the science, please do so, but if you wish to rubbish the science, be sure that you are rubbishing not only us, but the scientific community, and in particular the peer reviewers who reviewed these papers.

[189] I think that you are familiar with the findings. I will encapsulate them perhaps in a clearer way than they were encapsulated in the report. Badgers certainly contribute to the



disease in cattle, cattle contribute to the disease in badgers, and cattle contribute to the disease in cattle. We are talking about a cyclic disease. If one were adopting an approach to eliminate this disease, one would, given the scientific technology available, have to think in terms of dealing strongly with the badger component as well as the cattle component of the disease.

11.50 a.m.

[190] We recognise the fact that the cattle component is inadequately addressed at the moment in relation to the two cardinal principles of control of an infectious disease, which should be uppermost in farmers' minds at the moment given the incidences of foot and mouth disease. Those principles are accurate and speedy diagnosis and animal movement control. They are absolutely paramount, and added to those are aspects of biosecurity, many of which you are familiar with. It is debatable whether many of those are applied in practice, but I do not know whether you want to talk about that.

[191] The badger side of the coin is a more difficult situation because of the ecology and behaviour of the badger. If there were a direct relationship between badger density and the impact of badgers on cattle disease it would be a fairly straightforward matter to say that we should take out 50 per cent of badgers to deal with 50 per cent of the badger component. It is not like that because of badger ecology, and particularly because of the issue of perturbation, badger movement, social structures and the breaking up of social structures.

[192] Our evidence is that there is nothing but a simple relationship between badger density and cattle. For badger culling to have an impact on the disease in cattle, you would have to eliminate a large proportion of badgers. In the trial, we had a culling efficiency of about 80 per cent; that is established in the scientific record. It is published data, based upon field science and the methodology that we used in the trial. It led to a decrease of about 73 per cent or 75 per cent in the badger population in the areas where badgers were culled. There was not a direct correlation between trapping efficiency and badger removal, mainly because of immigration. Of course, there was some compensatory, continued reproduction among the remaining badgers.

[193] Modelling suggests that, in order to achieve the maximum impact from badger culling on the disease in cattle you need to get the badger population down to below 10 per cent of the current total. Therefore, you are looking at badger removal of above 90 per cent of the population, nearing elimination. The results from our trial and from Ireland are consistent with that. If one is going to go down that track, one must recognise what that means logistically. You must consider how you would achieve that situation. That is the reality of the situation. In a nutshell, those were the outcomes of our findings. Built into that are observations that we made within the trial with respect to individual areas. On the level of culling that we achieved, we got something like a 24 per cent reduction in the cattle disease in areas where badgers were culled. However, the knock-on effect of perturbation in the outside areas negated that. Therefore, overall, we had null effect as a result of culling in over 100 sq km, and that was with systematic and continued culling over a five-year period. Again, we can discuss culling methodology.

[194] With respect to reactive culling, the data are clear and accepted. Reactive culling as carried out in this country is very different to reactive culling in Ireland—they are like chalk and cheese. Reactive culling in this country, which involved localised removal of badgers, led to a worsening of the situation. That was simply a reflection of badger behaviour and ecology.

[195] **Alun Davies:** Thank you. That was a very clear introduction to many of the issues. You have covered the first subject to which I was going to refer in your answer in terms of the farming unions' reaction to your initial report in June. Farmers' unions put to us in July that they were very disappointed with many of your findings. One issue that was put to us by both

farmers' unions in Wales was that you were directed by Ministers not to propose a cull of badgers and that it was political pressure, rather than sound science, that led you down the road that you took.

[196] **Professor Bourne:** That was first mentioned at the select committee meeting in London; we are appearing again before the select committee on 24 October to address this issue. It is absolute and total rubbish. We provided the select committee with clear, documented evidence, following the release of data to DEFRA in the autumn of 2005, which was to support the autumn statement of the then Minister, Ben Bradshaw. The suggestion was that he would make some decision on TB control in late 2005. With the release of that data, the way in which things were going in the trial was quite clear. Subsequently, we had a number of discussions with Ministers, which were fully recorded—that information is now in the hands of the select committee—clearly showing what we thought the outcome of the trial would be and what would be in our final report. As recently as January or February of this year I met with the Secretary of State and also with Ben Bradshaw, the Minister, and made clear to them what the outcome of that work would be.

[197] I understand the frustration of the NFU, and I know how that frustration arose. I can assure you that there was no political pressure on us whatsoever in writing our report, and had there been any pressure, I would have strongly resisted it. However, it is interesting that some pressure was put upon us to rewrite parts of the fourth report, but we adamantly refused.

[198] **Alun Davies:** In what sense?

[199] **Professor Bourne:** DEFRA felt that we had perhaps over-interpreted data in parts of the report. Its comment at that time was that it was not data, but a commentary of progress—it was not data analysis or data interpretation, but a commentary of progress. We highlighted at that time some of the outcomes of the research, particularly with respect to cattle pathogenesis, that were causing us alarm, clearly showing that there was a problem in cattle that was not being adequately addressed. We absolutely refused to change one word of the fourth report, and had any pressure been brought upon us, we would have strongly resisted it. So, this is complete and utter nonsense.

[200] **Alun Davies:** I do not think that I need to ask you to clarify that in any way.

[201] My other question, Professor Bourne, before my colleagues ask their questions, is on the term 'holistic'. This term has been interpreted in the past—and I will paraphrase the views expressed by the farmers' unions in July—as a balancing of approach to cattle control measures, which you have described this morning and which are in your report, and to wildlife control to eliminate the disease, or a reservoir of the disease, within wildlife. Taken together, they say that this will lead to a holistic approach that can control and then possibly eradicate the disease.

[202] **Professor Bourne:** As I pointed out, given current technology, the only way of eradicating the disease is by way of a very forceful impact on the disease in cattle and an equally forceful impact on wildlife, which would lead to the virtual elimination of badgers. Where do you then start with deer and other wildlife, which we know are also likely to carry the infectious organism? Therein lies the difficulty. If you go down the path of eradication, it really is brutal at the moment, and I do not think that it is achievable, certainly on the basis of the criteria laid down by Lord Rooker at the time that we started our work, namely that badger elimination over large areas of the countryside was not an option, and, frankly, if it had been, we could not have achieved it.

12.00 p.m.

[203] We also had to take into account the welfare of badgers. We introduced the closed season to ensure that badger cubs did not die underground because we had killed lactating dams. We also had to take into account the welfare aspects with regard to the way in which we caught the badgers and killed them. All of those were political diktats that we had to respond to, because of the social needs identified by the Government of the day—that is, Lord Rooker. He will be aware of the directives given to us.

[204] **Alun Ffred Jones:** Therefore, a total eradication—or at least an attempt at total eradication—of the badger population was ruled out at the outset of your work?

[205] **Professor Bourne:** Yes, absolutely.

[206] **Alun Ffred Jones:** If we concentrate on the culling aspect of your report, you rejected that on the grounds that it was unacceptable.

[207] **Professor Bourne:** We did not reject it; it was a Government diktat.

[208] **Alun Ffred Jones:** You also suggested that, perhaps, it was impossible or too costly.

[209] **Professor Bourne:** I think that it would have been impossible. There were constraints; landowners had to give permission for us to go onto their land. While we found, subsequently, that we could kill quite a high proportion of badgers around inaccessible land in the way that we did the trapping, it certainly would not lead to the eradication of those badgers. We could not identify the owners of 13 per cent of the land even though DEFRA had an army of civil servants trying to do this. They could not find out who owned this 13 per cent. We had a high level of co-operation from farmers and we overcame the access problem with the expertise of the wildlife groups and DEFRA by trapping around the edges of that land. However, we still recognised that if you cull in one area, there are plenty of badgers outside the area that will move in. That is what happened; there is no shortage of recruits. That is the way that badgers behave.

[210] **Alun Ffred Jones:** To take you back to something that you said about reactive culling and the difference between what was meant by that in Ireland and in the UK; what did you mean?

[211] **Professor Bourne:** What is the big difference? It is important to recognise what the Irish mean by reactive culling and how they respond to reactive culling. The culling during the trial—and the East Offaly experiment—was carried out on a proactive basis. In the four areas trial, they had a proactive culling area surrounded by a large buffer area, and outside that were their control areas. When the trial finished, the Irish went down the course of badger elimination over 30 per cent of their land mass—that is stated Government policy. They are well down the track of doing that now. They started this in, I think, 2003.

[212] Their reactive cull is to identify a breakdown and then expand the culling around that breakdown and to do repeat culling. As time goes on, as they find another breakdown, the policy is to expand those areas. In that way, they react to breakdowns. However, by doing so, it becomes no more or less than an increasingly large proactive cull. They are repeatedly taking badgers out. They do this effectively by using snares, a few times a year. They have a small workforce and 100 per cent farmer co-operation. As you know, they have no anti-badger-killing activity in Ireland. The other important thing about Ireland as compared with the UK is the much lower badger population—it is about a fifth of that recorded in GB.

[213] **Alun Ffred Jones:** Has that been successful, do you think?

[214] **Professor Bourne:** It is difficult to know. I heard some of your discussion with

previous witnesses about the scientific rigour and the set-up of the Irish trial. There is no question that there were aspects of the Irish trial that could have been much better, but you cannot deny that they have made a significant impact in trial areas on cattle TB.

[215] **Alun Davies:** Could you outline the areas where you think the trial could have been improved?

[216] **Professor Bourne:** For instance, we included in our trial a large number of variables, with respect to previous history—variations in cattle testing, badger density, changes in badger density, and a whole array of factors—which were not taken into account in the Irish trial. That is not to say that the Irish trial was not useful—I think that it was. However, what it could not do, specifically, was give a quantitative assessment of the impact of culling on the disease in cattle. If you look at their original paper, which was published, I think, in January 2005, there are tremendous variations in the likely impact that they recorded in these four different areas—from around 50 per cent to around 90 per cent. They were suggesting an overall figure of 70 per cent impact. That has now been revised to 42 per cent, or thereabouts, which is fairly consistent with the results that we found. So, I find no inconsistency between the Irish trial and our own.

[217] However, there is another big difference, which is that their control areas were culled out, some of them for political reasons, and scientifically that is bad news. Moreover, although they conducted their trial in areas where it was possible to identify geographical barriers, they were not always successful in doing this. They had a 6-km-wide buffer zone around the proactive culling areas, but we have never seen data on incidence of cattle TB in those buffer zones, and whether there was a knock-on effect as a result of perturbation. Perturbation was definitely recorded—it was an issue. However, on the question of whether perturbation led to an increase in cattle TB, they did not have the data, or they certainly have not published it.

[218] **Alun Ffred Jones:** May I ask one question? I am not quite sure if it is in your report, but confirmed new herd incidence in Wales has risen threefold since 1998.

[219] **Professor Bourne:** Since 1998?

[220] **Alun Ffred Jones:** Yes. What do you think accounts for that?

[221] **Professor Bourne:** In fact, if you go back to the 1980s there has been, on our calculation, a doubling of the incidence every four and a half years across Britain. It is not exponential, but it is a serious situation that we face. The question is why. One does not really know the answer. However, I think that, historically, one can identify that, when there was an easing of cattle restrictions, it was associated with an increase in the incidence of the disease in cattle.

[222] That is not to say that badgers were not also involved; this is a cyclic disease. During that time, there is evidence that the badger population has been increasing. The evidence now suggests that the population has stabilised, or is even dropping. That is more a question for ecologists than for me, but that is the information that I get. I would put the increase in incidence down to some badger component, but also quite a major and significant cattle component, as a result of the relaxation of cattle controls, with an increase in intervals between testing, and certainly a reduction in the use of whole-herd slaughter, which was used infrequently in the previous 10 or 15 years. I think that this is exemplified by recent work done in pilot trials, which has shown, for instance, that in multiple-reactor herds—that is, herds with over three reactors, which make up, in Wales, something like 30 per cent of your breakdown herds, and more than that in the west of England—the tuberculin test has not controlled the disease in these herds.

12.10 p.m.

[223] Across the board it will result in 11, 15 and 24 per cent of tuberculin-negative animals being left in the herd that are actually infected. Not all of those will be capable of transmitting the disease, but a proportion will. So there are inadequacies in the tuberculin test. The irony is, although there is much debate about the sensitivity of the tuberculin test and whether it is 90, 80 or 65 per cent, that the evidence indicates that the more infection there is in a herd, that is at a time when you would need higher sensitivity of the test to be effective, the sensitivity gets lower, so the more you challenge the tuberculin test as an individual animal test, the less effective it is.

[224] **Alun Davies:** Thank you, Professor Bourne; you are causing great excitement among my colleagues. I will call Lorraine next, then Brynle and then Nick.

[225] **Lorraine Barrett:** Going back to the Irish experience, I made a few notes when you said that Ireland will eliminate 90 per cent of its badger population over 30 per cent of its land mass. This may be a difficult question for you to answer because it is almost a personal one, but do you feel that the almost total elimination of badgers is worthwhile in order to eradicate bovine TB and, were that to happen, how long would it take before TB appeared in cattle again via other wildlife? You mentioned deer earlier, so where do you stop? If you get rid of the badgers, another bus will come along. Do you feel that the total elimination of badgers is worthwhile to eradicate TB?

[226] **Professor Bourne:** I cannot answer the second question. With respect to deer, it is known that there are now studies on the prevalence of TB in deer. One does not know what contribution they make to the disease in cattle and one supposes that that contribution probably is not very great, but the information is lacking with respect to deer. There are numerous other hosts that can be regarded as dead-end hosts that probably do not play a great part in the disease epidemiology.

[227] On whether badger culling is worthwhile, with respect, that is a social and political question. We have provided the scientific evidence that shows very clearly, I believe, that if you partially cull locally in a reactive way, you make the situation worse. If you proactively cull over a large area, there will be winners and losers. Overall, the impact will be relatively modest and the disease will spread. So, you are really talking about putting a disease-control policy in place that actually spreads the disease—there cannot be any precedent ever, anywhere, of putting a policy in place that is known to spread the disease. That is a dilemma that you, as politicians, are faced with. However, to my mind, the science is clear—it does not help you in your holistic approach; it makes life damned difficult, but that is the reality of the situation. I can appreciate why farmers want to get together as we propose, but the only way to do that is over very large areas. You will dilute the perturbation effect around the edges—you will not eliminate it, but you will dilute it, unless—

[228] **Alun Ffred Jones:** What do you mean?

[229] **Professor Bourne:** We are talking about 300 to 400 sq km. If you extend over that area, you can see from my report that you are into a gain situation. However, the gain is still rather modest and that is taking into account the edge effect. However, the logistics of doing that are incredible. What it requires, on the basis of our findings in the trial, is a systematic cull across the whole area that is simultaneous. We found, through pure chance and serendipity, that when we did some culls on the basis of sector culling—moving around the trial areas—TB in badgers had doubled as a result of us chasing badgers around the piece. Culling has to be simultaneous; it cannot be patchwork. So, logistically, for farmers to achieve that is utterly impossible. If Government wanted to achieve that, you would have to

put in the necessary resource. We have been criticised for low culling efficiency, and we are criticised by people who read the data and refuse to accept the data. However, the ground truth in data is that we achieved 73 per cent badger removal, which is consistent, as I say, with 80 per cent culling efficiency.

[230] We cannot measure culling efficiency; we can only measure badger removal. Again, it is on record—and you will have access to these records—that after every cull, we asked independent ecologists to go into the culled area and assess badger removal, and therefore culling efficiency. In almost every case it was up around the 80 or 90 per cent mark—not in every case, because it depended on the time of the year and climatic situations at the time of the cull. What we did were military exercises. These guys spent months surveying the land, determining where these setts were. You cannot just rely on local knowledge; it is a military exercise. I do not doubt that if you wanted to do it that you could, but, by God, logistically, it would be an enormous problem and you would then have to decide whether it was really cost-effective and worthwhile. I am sure that the Badger Trust would tell you about the social disturbance that that would lead to; well, I have some experience of that too, at the hands of badger activists. In the early part of our trial they were really on our tails and it was damned uncomfortable. At the latter end of the trial they backed off, but it is really uncomfortable when you have this sort of activity going on around you and you are threatened, as we were.

[231] **Alun Davies:** Lorraine, do you have a point to raise?

[232] **Lorraine Barrett:** No, I am fine, thank you.

[233] **Alun Davies:** Brynle, do you have a point to raise?

[234] **Brynle Williams:** In your estimation, then, if we go down the cattle route of testing, pre-testing and so on, how long would it take us to get a handle on this TB?

[235] **Professor Bourne:** The modelling suggests that if you go down the cattle route with improved diagnosis and rigid movement controls, the pattern of recovery would be similar to that of disease development. So, it would not happen overnight, but you would quickly see a reversal and then a fall in the incidence. It would not lead to eradication and there is the vexed question of farmers whose animals have infection from wildlife and what they do about the disease—

[236] **Brynle Williams:** Quite.

[237] **Professor Bourne:** It is a very difficult question and, frankly, other than living with it, it is very difficult to resolve. In our report, we suggested—not elimination; I do not believe that one can talk about elimination really. Australia claims to have eliminated the disease, but it has not; it has the odd breakdown. Let us say that near total control could be achieved in many parts of the country. I am less familiar with Wales, but I note that 40 per cent of your farms are on four-year testing, which suggests to me that quite a chunk of Wales is relatively disease free. It is important to keep those areas disease free. One assumes that if there is wildlife infection, it is at a very low level. Keep it at a low level. Rigid controls on the cattle disease—through better diagnosis, movement control and a very aggressive approach to breakdowns in those areas—would lead to almost total control. The question is what you do in high-risk, hot spot areas. We addressed that by saying that it is pointless to think that you can eliminate that in anything but the very long term. You have to put systems in place that allow farmers to operate. We suggested that, with farms, there should be zoning, but we discarded that, saying that it is impractical. A far better approach is a biosecurity approach by identifying high-risk and low-risk farms, controlling trading between those farms, and then moving towards keeping disease out of the low-risk farms and gradually reducing the disease in the high-risk areas. It will be a long haul, but I am sure that you are aware of what has been

achieved in Northern Ireland in the short period in which it has been introducing improved cattle controls. Of course, the difficulty in southern Ireland is that while it is certainly moving towards the eradication of badgers over this large land mass, it is also focusing on improved cattle controls, so you will never be able to tease out one from the other. A relevant question for you to ask is not what happened in the trials but what is happening across the piece in southern Ireland and what is happening in the badger removal areas—this 30 per cent area in which it is moving towards badger removal.

12.20 p.m.

[238] **Brynle Williams:** If we are not careful—if I have understood you correctly—we could end up with a two-tier livestock quality in Wales, which would destroy the cattle industry in certain parts of Wales.

[239] **Professor Bourne:** I can only comment on the discussions that I have had with agricultural economists on that, who believe that the trading blocks are totally adequate to ensure that that does not happen. I would also say that sensible farmers would be operating this now—who in their right mind in a TB-clear area would buy cattle from a TB-high-risk area? It has happened, of course—it happened post-foot-and-mouth disease and that provided us with invaluable evidence of the movement of disease around the country as a result of cattle movement. Some of the herds that were moved post-foot-and-mouth disease were not tested, but in the study, which incorporated 31 farms, only five of those did not test. The others had tested cattle but they still went down as a result of infected animals being moved around in spite of the use of the tuberculin test. No-one in their right mind would conceive not having this trading block—it is the basis of biosecurity.

[240] **Alun Davies:** Brynle, a ydych yn hapus gyda hynny?  
**Alun Davies:** Brynle, are you happy with that?

[241] **Brynle Williams:** Ydw. **Brynle Williams:** Yes.

[242] **Mick Bates:** You recommend in the report that there must be better diagnosis of tests, and you have already mentioned the effect of continual testing on the sensitivity of the tuberculin test. Can you expand on this and comment on how we could improve the diagnosis and the testing regime, and the possible use of gamma-interferon test within that?

[243] **Professor Bourne:** There are two aspects to this issue—one is the tuberculin test, which I will come back to in a moment, and the other is use of the gamma-interferon test. It was clear to us very early in our work that future control methods would necessitate an improved diagnosis. The only diagnostic test available was gamma interferon; much work had been done in Australia in particular on developing the test, but not using the test, because it was at the end of its eradication campaign before gamma interferon really became available to it. So, most of the work has been done in New Zealand and the United States. We recommended in 2001 that work should be done in this country on improving the test—this is laboratory work done at the Central Science Laboratory and that work is still going ahead, and I think that it has done a pretty good job in that.

[244] The other deficiency that we recognised was field data on how that test could be used and performed in the field. Unfortunately, DEFRA would not support those proposals. Instead, it went down the route of a pilot trial and it documented our resistance to that—we reckoned that it would not even provide the answer to the question it was asking, namely whether it would reduce the time under which problem herds were restricted. In fact, it did not answer that, but, by God, it threw up some dusty indicators of the inadequacies of the tuberculin test, to which I have already referred. In these multiple-breakdown herds, anything between 11 per cent to 24 per cent of animals that evaded the tuberculin test were diseased.

[245] The test has been used in a more ad hoc way and it further emphasises the problems of diagnosis using the tuberculin test, so there is no question in our mind that there are situations where the gamma-interferon test must be used. You will note from my report that we provided the cattle data that were available. We recommended that there were inadequate data and that the gamma-interferon test in particular should be used in the field not just to support policy but to provide further information so that one could be more certain about how it is used in a particular disease situation in herds. We also recommended that, in future, there should be a move towards replacing the tuberculin test entirely with the gamma-interferon test. We are not there yet, as there are all these questions about specificity and sensitivity, but you have to remember that, with these tests, you can balance one against the other. You can get 99 per cent sensitivity with gamma interferon, equivalent to tuberculin, but you have reduced sensitivity. You can trade and lade. It is that sort of information that is essential.

[246] Initially, however, we are suggesting that this information should be obtained by using it in specific situations. Keeping disease out of low-risk areas is paramount, and if there appear to be herds of multiple breakdown in those areas, gamma interferon will be an appropriate tool to use to clear those herds of infection. If one is in any doubt of clearing a herd, those herds should be eliminated. Equally, in high-risk areas, there are situations in which it could be used as a pre-movement test. It certainly could be used to complement the tuberculin test, without replacing it. This is the nub, because you are adding another layer of cost. However, we were not prescriptive about how it should be used; we were saying that it should be used in situations in which it is deemed to be a useful tool for disease control but in a way that gives you useful information on widening the scope of its use. The more you use a test like that, the cheaper it will become to conduct it—you just automate the darned things.

[247] That brings us on to discuss the tuberculin tests. The Department for Environment, Food and Rural Affairs is conducting an exercise in asking whether the tuberculin is less valuable now than it was in the 1960s and the 1970s. The thing is we do not know. During my experience in practice in the 1960s, when there were small farms and herd elimination was fairly widely used, the tuberculin test was developed as a herd test, and not as an individual animal test, and it has never been refined since. It is being suggested now that a change in genetics in cattle may have influenced the test and there may, as a result of its continued use, be a change or selection of particular types of TB which evade the test. All these issues are there for discussion, but the fact remains that the TB test at the moment, whatever the cause, is not performing as well as one would expect or hope. Whether it is any different from the situation in the 1960s and 1970s, we do not really know, because of changes in farming, such as herd size, breed of cattle, animal movement and so on.

[248] **Mick Bates:** You quoted a figure that seems to suggest that, in some instances, there could be a reservoir of TB ranging from 11 to 24 per cent in a particular herd. Did I understand that correctly?

[249] **Professor Bourne:** Those are the data available from the gamma-interferon pilot trial, yes. That is in multiple-reactor herds.

[250] **Mick Bates:** They are just the multiple reactors, are they?

[251] **Professor Bourne:** No, those data are from multiple-reactor herds. However, if you accept that the tuberculin test is, say, between 75 and 80 per cent sensitive, the fact that you get 40 per cent—or, in some areas, a higher percentage in four-yearly tested areas—single breakdowns means that, statistically, you will know that there are proportions of herds that are just being missed, if they have only one animal. Statistically, you know that, of those herds with one infected animal, a proportion of those herds is also being missed. So, it goes across the board, and I think that the reservoir of infection is likely to be far more serious in



multiple herd breakdowns. In Wales, there are 37 per cent of these with three reactors or more, while in the west of England, it is around 40 per cent, and these are serious problem herds. The limited evidence suggests that continued use of the tuberculin test, despite its appearing to clear these herds so that they can be traded, does not clear these herds of infected cattle.

[252] **Mick Bates:** There are a few points arising from this. You repeatedly said that we have moved on in terms of the quality of the tests, and particularly skin tests. How much research is being done, and how quickly can we improve these tests?

12.30 p.m.

[253] **Professor Bourne:** The easy thing to do is to put in an assessment of quality control. DEFRA did a study on quality control about two years ago, and found that that small study asked some pretty searching questions. The first thing one could do would be to put in quality control across the board. I am quite sure that DEFRA is pursuing the question regarding the appropriateness of the type of tuberculin being used, and whether, in its words, it is fit for purpose. Coupled with that is the ongoing work with gamma interferon, and the identification of an increasing range of antigens that can be used in the gamma-interferon test. This can be applied in practice. That work is going on, but it is critical, as we mentioned in our report, that DEFRA grasps this science and applies it in the field—in what we call ‘adaptive management’—to get more data and to then respond to those data to hone their cattle control measures.

[254] **Mick Bates:** On the use of the skin test and gamma interferon, did you make any estimate of the costs involved if we were to use both tests in conjunction with each other? I cannot recall. One of the problems is that people say that using gamma interferon is so sensitive. I know of cases in which a whole herd was taken out on the basis of gamma interferon. I see that there is no estimate of the costs that would be incurred by improving the accuracy of the diagnostic testing.

[255] **Professor Bourne:** It was not within our remit to do that. For some time, DEFRA had a small study to report on the costs of the gamma-interferon test. Quite honestly, it is only when you use the test on a large scale that you can reduce the cost of it. It has been estimated that the cost is no more than that for the tuberculin test, taking into account that it involves only one visit to the farm, that it is lay personnel who are taking the blood sample and that laboratory tests can be automated. It is only when you get into these things that you can get a true level of costing. However, at the moment, we are not suggesting that gamma interferon replace the tuberculin test; it is complementary to it and is therefore an additional cost. We believe that there should be a real drive to get diagnostic testing done across the board, using gamma interferon. There has to be an ongoing scientific push for that, but there also has to be political will to do it.

[256] **Alun Davies:** We appreciate that. Thank you, Professor Bourne.

[257] **Brynle Williams:** Professor Bourne, you were saying that cattle-to-cattle contact and movement need to be looked at far more. However, when we took evidence in July at the Royal Welsh Show, it was rather alarming to hear that reactor animals were being left on farms for up to three months. Will you comment on that, please?

[258] **Professor Bourne:** I think that the whole procedure of dealing with these infectious potential disease transmitters should be tightened up. They should be removed as speedily as possible. That is part of the biosecurity issue. When you talk about biosecurity, you talk about wildlife, which is a jolly difficult issue. However, cattle biosecurity embraces everything from improved diagnosis, to cattle movement, to quarantine, to the speedy removal of infected

animals from premises, and particularly to a discipline regarding where you buy these animals and the necessity of preventing contact with neighbouring farms.

[259] **Brynle Williams:** Would you go one step further and say that it is time we had a gamma-interference laboratory of our own in Wales to speed up this process considerably?

[260] **Professor Bourne:** I think that it really needs consideration of how you can most effectively use gamma interferon. We have indicated how it might be used; we have given a steer as to how you might think about it. Certainly, with respect to clear areas, there should be pre-movement testing, and then, in high-risk areas, the less heavily infected herds should be identified. There is no point in doing this on heavily infected herds, because you move down to a point of eliminating half, and you make them non-viable. You have to be proportionate about this. We were immediately criticised, with people asking, 'How can you be proportionate?'. You really have to make a decision and stick to it, and move down the track of gradually reducing the incidence in cattle.

[261] We have highlighted the path down which one could go to do that, but we also recognise, and there are data from DEFRA that show this, that 85 per cent of cattle in GB are not ever tested. These cattle are not tested in their lives. You would expect something like 60-odd per cent not to be tested, but not 80-odd per cent. So, cattle are evading testing. I have had a number of e-mails from animal health officers on this. This sort of thing does not make the headlines. What makes the headlines is what a load of rubbish we are doing and we are devastating the industry. I have had e-mails suggesting that, in some herds, there are 53 cattle for testing, but they find that only two are eligible for testing. It is barmy.

[262] We have other situations in which there are farms on individual holdings. There was one situation—and this was in Wales—in which one herd of 500 cattle was on 10 holdings. The main holding was in a high-risk area, but they were able to move cattle without any pre-movement testing to all the other holdings, which were in low-risk areas. This type of biosecurity needs to be grasped, but it is not. How widespread this practice is, I do not know, but it clearly happens and it must be stopped.

[263] **Brynle Williams:** I am interested in the theory of clean areas, clean or relatively low-risk cattle. We have talked a lot about cattle testing and so on, and I cannot remember the exact term for genetically fingerprinting badger setts, but can we or should we be using more of that? It is in its infancy—

[264] **Professor Bourne:** It is PCR—the polymerase chain reaction.

[265] **Brynle Williams:** That is the fellow.

[266] **Professor Bourne:** There is great enthusiasm for this, which we have tried to dampen down for two reasons. One is that PCR is, as yet, unproven as a tool to be used in the field. It has been used in an attempt to identify microbacteria in the environment. It is true to say that we have limited information on the persistence of microbacteria in the environment and of the likely contribution that it makes to the disease in cattle, but one can assume, based on an understanding of the principles of infectious disease transmission, that the likelihood of direct transmission from an infected animal to an uninfected animal is far greater than transmission from the environment, but we cannot rule it out. PCR is being used in a way that cannot distinguish between dead microbacteria—that is, little bits and pieces of microbacteria—and live microbacteria. That is a serious deficiency of PCR, and you can never overcome that problem except by culture of the organism, and culture of the organism from the environment is extremely difficult and costly to do, and probably not useful.

[267] However, even if one did have a live test to which you could subject badgers, and

take out not just infected badgers but the whole sett, you would be left with a problem. That problem is that you would be unlikely to remove them all, even if you used gassing—and that is the evidence from Thornbury over the years—and it would inevitably lead to perturbation. So, you will have the same outcome from that approach as we found from the reactive strategy of killing badgers around infected farms. Although we found clustering of infected badgers, it is wrong to believe that they are not widely spread; I am afraid that they are. Farmers would encapsulate the problem easily by saying, ‘We have too many badgers’; they are probably right, and that is what leads to the perturbation. If you get down to a level of near elimination, you can forget perturbation. It occurs, but the consequences of it disappear.

[268] **Alun Davies:** Thank you, Professor Bourne, your remarks this morning have been extremely helpful to us in our work and we appreciate that. We thank you for the time that you have taken.

12.40 p.m.

[269] **Professor Bourne:** May I make a final comment that I hope you might find useful? It relates to the discussion that I have heard regarding geographical boundaries and culling to those boundaries. It may be that you will be asked to comment on this at some time. It is quite true that in the Irish four areas trial, they purposefully selected boundaries that were relatively impervious to badger movement, but, even there, they found it difficult. In Donegal, it was quite easy, because most of the boundary was coastline; 89 per cent of the boundary was a physical barrier to badger movement. However, despite the fact that they tried hard, the figure was 53 per cent in Cork, 53 per cent in Kilkenny and only 19 per cent in Monaghan. So, even though they designed their trial areas around badger-proof boundaries as best they could, they found it difficult.

[270] Our approach was different, in that we focused on TB hot spots, for obvious reasons, but we tried to fine tune the boundaries to provide physical barriers where possible, such as motorways, large rivers and coastline. In terms of three of our triplets, we found no geographical boundaries that we could describe as creating physical barriers to badgers. Other triplets had physical boundaries of 1 to 2 per cent, 15 per cent, 17 per cent and 31 per cent. One had a physical boundary of 45 per cent—this was on the tip of Cornwall where we had the sea as a boundary. The irony was that, in that area, there was an awful lot of coastal leisure activity and National Trust activity, and the level of farmer co-operation was the lowest that we had in any of our trial ideas—it was around 50 per cent, whereas normally we had around 75 per cent, 80 per cent, or even more. So, that information may be useful to you in discussing, if you get around to it, the option of culling over large areas. Quite honestly, finding geographical boundaries that are impervious to badgers is very difficult. That is notwithstanding the logistical problems of taking badgers down to a low enough level so as to not worsen the situation that you are trying to deal with.

[271] **Alun Davies:** Thank you, Professor Bourne. That is useful. We will be discussing the Irish example within the next month or so. Thank you for your time. A written transcript of this morning’s session will be provided to you. With your permission, we may wish to write to you for further information as our discussions continue.

[272] **Professor Bourne:** If I can help in any way, I would be glad to do so.

[273] **Alun Davies:** Thank you.

12.43 p.m.

**Papur i'w Nodi**  
**Paper to Note**

[274] **Alun Davies:** Since our last meeting in July, we have had a number of outbreaks of foot and mouth disease across the border in England. I wrote to committee members during the recess and advised them that I had asked the Minister, Elin Jones, to provide us with a written report on her actions to date. That letter is within your papers and can be noted now. I propose that we continue to monitor the situation and the Government's actions in terms of its response to foot and mouth disease, that we invite the Minister to come here and that we conduct a review of the Government's actions when that is appropriate. If Members believe, in the meantime, that the Government is not taking appropriate action to control the disease, I will call a special meeting of this committee to discuss that. Otherwise, we should allow the Government, Ministers and officials to focus on dealing with the disease rather than dealing with this committee. Do you accept that?

[275] **Mick Bates:** I accept that. I think that it is worth noting that the spokespeople of the various parties meet regularly, and the Minister has kept us well informed about events, as have her staff. The only other issue that I would raise is that we are all aware that the Finance Committee is scrutinising the Government's expenditure on this. Has any contact been made with the Chair of that committee so that there may be an input from us?

[276] **Alun Davies:** I am a member of that committee, and Alun Cairns and I have held formal discussion on this. This will be a matter of discussion in this afternoon's meeting. I have proposed that if we conclude that we wish to hold an inquiry or an evidence session on foot and mouth disease, we do it as a joint committee rather than asking people to appear twice to discuss the same issue. Again, these are issues that we can resolve outside these meetings. Are you content with that? I see that you are. Thank you.

*Daeth y cyfarfod i ben am 12.45 p.m.*  
*The meeting ended at 12.45 p.m.*